U.S. Fish & Wildlife Service

Canaan Valley National Wildlife Refuge

Comprehensive Conservation Plan

February 2011

Front cover:
Main Tract - Glade Run
Kent Mason

Nature study at Blackwater River
David Seals

American woodcock
Richard Baetsen/USFWS

Glade spurge
Ken Sturm/USFWS

Cheat Mountain salamander and eggs
Kent Mason

Back cover:
Main Tract - Glade Run
Kent Mason

This blue goose, designed by J.N. "Ding" Darling, has become the symbol of the National Wildlife Refuge System.

The *U.S. Fish and Wildlife Service* is the principal Federal agency responsible for conserving, protecting, and enhancing fish, wildlife, plants, and their habitats for the continuing benefit of the American people. The Service manages the 150-million acre National Wildlife Refuge System comprised of more than 550 national wildlife refuges and thousands of waterfowl production areas. It also operates 70 national fish hatcheries and 81 ecological services field stations. The agency enforces Federal wildlife laws, manages migratory bird populations, restores nationally significant fisheries, conserves and restores wildlife habitat such as wetlands, administers the Endangered Species Act, and helps foreign governments with their conservation efforts. It also oversees the Federal Assistance Program which distributes hundreds of millions of dollars in excise taxes on fishing and hunting equipment to State wildlife agencies.

Comprehensive Conservation Plans provide long term guidance for management decisions and set forth goals, objectives, and strategies needed to accomplish refuge purposes and identify the Service's best estimate of future needs. These plans detail program planning levels that are sometimes substantially above current budget allocations and, as such, are primarily for Service strategic planning and program prioritization purposes. The plans do not constitute a commitment for staffing increases, operational and maintenance increases, or funding for future land acquisition.

U.S. Fish & Wildlife Service

Canaan Valley National Wildlife Refuge

Comprehensive Conservation Plan
February 2011

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Refuge Vision Statement

Canaan Valley National Wildlife Refuge showcases the largest contiguous, high elevation wetland complex in West Virginia and harbors a vast assemblage of rare plants and animals normally associated with more northern latitudes. The refuge conserves, protects, and manages a mosaic of wetland, forested, and early successional habitat that supports migratory birds and threatened and endangered species. As a steward of a significant portion of the headwaters, the Refuge ensures the integrity of the natural resources of the upper Blackwater River watershed. Refuge habitats and wildlife are conserved and managed through research and collaboration with Federal, State, and local conservation partners.

As an integral part of the surrounding community, the Refuge provides high quality, safe, wholesome, and diverse opportunities for education and recreation, especially hunting and wildlife observation. The refuge experience fosters public interest in the beauty and unique character of Canaan Valley, an appreciation of fish and wildlife ecology, plant ecology, and stewardship of the natural world. Visitors develop a greater understanding and appreciation for the mission of the National Wildlife Refuge System and refuge management programs, and for the importance of protecting lands for wildlife conservation.

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Summary

Type of Action: Administrative

Lead Agency: U.S. Department of the Interior, Fish and Wildlife Service

Responsible Official: Marvin Moriarty, Regional Director, Region 5

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This Comprehensive Conservation Plan (CCP) for the 16,193-acre Canaan Valley National Wildlife Refuge (Canaan Valley NWR) is the culmination of a planning effort involving West Virginia State agencies, local partners, refuge neighbors, private landowners, the Canaan Valley NWR Friends Group, and the local community. This CCP establishes 15-year management goals and objectives for wildlife and habitats, public use, and administration and facilities.

Under this plan, we make improvements to the refuge's biological and public use programs. We will balance the conservation of a mixed-forest matrix landscape with the management of early successional habitats and the protection of wetlands. We will also increase opportunities for hunting, fishing, environmental education and interpretation on the refuge, and we will improve our outreach and visibility in the community through new or enhanced partnerships. Finally, we will employ an adaptive management approach that includes adjusting our objectives and strategies as a result of new information.

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Chapter 1

Ken Sturm/USFWS

Canaan Valley National Wildlife Refuge

The Purpose of and Need for Action

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Introduction

This Comprehensive Conservation Plan (CCP) for the Canaan Valley National Wildlife Refuge (refuge) was prepared pursuant to the National Wildlife Refuge Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Refuge Improvement Act) (Public Law 105-57; 111 Stat. 1253). An Environmental Assessment (EA), as required by the National Environmental Policy Act of 1969 (NEPA), was prepared with the draft CCP.

This final CCP presents the combination of management goals, objectives, and strategies that we believe will best achieve our vision for the refuge; contribute to the mission of the National Wildlife Refuge System (Refuge System); achieve refuge purposes; fulfill legal mandates; address key issues; incorporate sound principles of fish and wildlife management, and serve the American public. This CCP will guide management decisions and actions on the refuge over the next 15 years. It will also help us communicate our priorities to West Virginia's natural resource agency, our conservation partners, local communities, and the public. As part of this process, we have met our requirements to coordinate with the State wildlife and habitat conservation plans under the NWRSA, 16 U.S.C. 668dd(e)(3).

This CCP contains 5 chapters and 11 appendixes. Chapter 1, "Purpose of and Need for Action," sets the stage for chapters 2 through 5. It

- describes the purpose of and need for a CCP
- identifies national and regional mandates and plans that influenced this plan
- highlights the purposes for which this refuge was established and presents its land acquisition history, and
- presents our vision and goals for the refuge.

Chapter 2, "Planning Process," describes the planning process we followed, including public and partner involvement in developing this final CCP.

Chapter 3, "Affected Environment," describes the existing physical, biological, and human environment in and around the refuge.

Chapter 4, "Management Direction and Implementation," presents the actions, goals, objectives, and strategies that will guide our decision-making and land management. It also outlines the staffing and funding needed to accomplish that management.

Chapter 5, "List of Preparers," lists the members of the core planning team and other Service personnel who assisted us.

Eleven appendixes provide additional documentation and information we used in compiling this plan.

The Purpose of and Need for Action

Our goal, which is directly connected with the Refuge Improvement Act, is to develop a CCP for the Canaan Valley refuge that best achieves the purposes, vision, and goals of the refuge and best contributes to the mission of the National Wildlife Refuge System (Refuge System); adheres to relevant Service policies and mandates; addresses key public issues and conservation issues; and incorporates sound principles of fish and wildlife science.

Developing a CCP is vital for the future management of every national wildlife refuge. The *purpose* of this CCP is to provide strategic management direction for the next 15 years by

- providing a clear statement of desired future conditions for habitat, wildlife, visitor services, staffing, and facilities;
- providing State agencies, refuge neighbors, visitors, and partners with a clear understanding for the reasons for management actions;
- ensuring refuge management reflects the policies and goals of the Refuge System and legal mandates;
- ensuring the compatibility of current and future public use;
- providing long-term continuity and direction for refuge management; and,
- providing direction for staffing, operations, maintenance, and annual budget requests.

There are several reasons why we need this CCP. First, the Refuge Improvement Act requires us to write a CCP for every national wildlife refuge to help fulfill the mission of the Refuge System.

Second, the refuge's 1994 Station Management Plan is 15 years old. Since that document's publication, the refuge land base has grown significantly, and its management priorities have evolved. The Indiana bat *(Myotis sodalis)*, which was Federally listed as endangered in 1967, and the Cheat Mountain salamander *(Plethodon nettingi)*, which was Federally listed as threatened in 1989, are both found on the refuge and are now management priorities. The West Virginia northern flying squirrel *(Glaucomys sabrinus fuscus)* was removed from the Federal list of endangered species in September 2008 but is still of management concern since it also exists on the refuge.

Third, we have developed strong partnerships vital to our continued success, and we must convey our vision for the refuge to those partners and the public.

All of these reasons clearly underscore the need for the strategic direction a CCP provides. To help us resolve management issues and public concerns, our planning process will incorporate input from natural resource agencies of West Virginia, affected communities, individuals, organizations, our partners, and the public.

Regional Context and Project Analysis Area

The refuge, located in eastern Tucker County, West Virginia, sits in the Canaan Valley, 3,200 feet above sea level in the Allegheny Mountains (see see map 1-1).

On September 11, 1994, 86 acres of land were purchased to establish the Canaan Valley refuge. This was the 500th refuge created by the Service. More land was acquired over the following years and the refuge grew to approximately 3,000 acres. In 2002 the Service bought 12,000 acres from Allegheny Power Systems, bringing the refuge to its current size of about 16,193 acres.

Canaan Valley contains a wetlands complex of about 8,400 acres, making it the largest wetlands system in West Virginia. Of these total wetlands, 5,573 acres are located within the refuge.

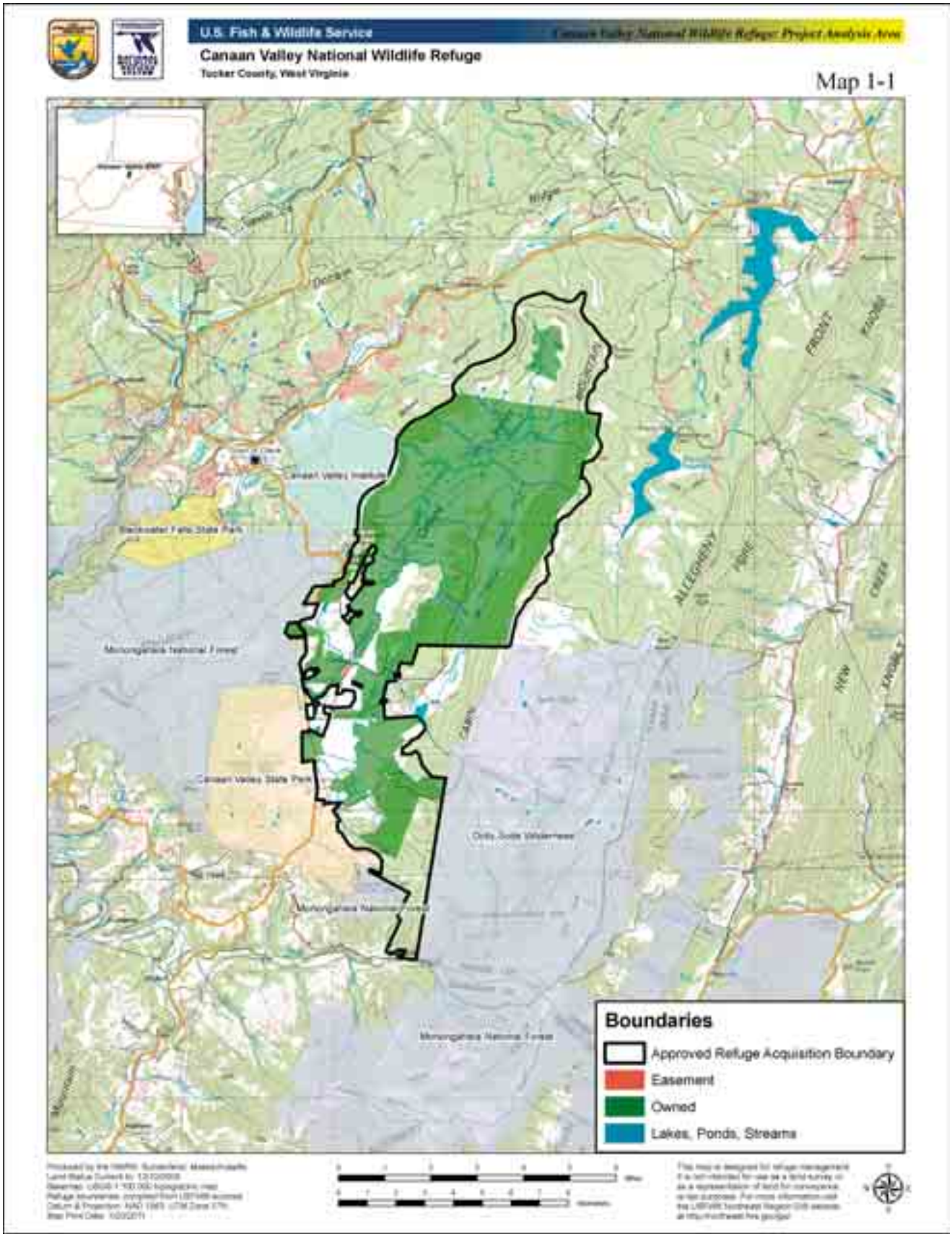
The headwaters of the Little Blackwater River, 13 miles of the Blackwater River, and many miles of other tributaries are also within the refuge boundaries.

The Service and the Refuge System Policies and Mandates Guiding Planning

Although the National Wildlife Refuge System Administration Act of 1966 as amended by the Refuge Improvement Act of 1997 and each refuge's purpose provide the foundation for management, the administration of national wildlife refuges conforms to a variety of other Federal laws (including the Migratory Bird Treaty Act, Endangered Species Act (ESA), Wilderness Act, Archaeological Resources Protection Act, National Historic Preservation Act), Executive Orders, treaties, interstate compacts, and regulations pertaining to the conservation and protection of natural and cultural resources. The section below describes some of these policies and mandates that have played a critical role in our planning process. The "Digest of Federal Resource Laws of Interest to the USFWS" provides a full list (online at *http://www.fws.gov/laws/Lawsdigest.html*).

Ken Sturm/USFWS

Freeland Tract Sign


U.S. Fish & Wildlife Service
Canaan Valley National Wildlife Refuge
Tucker County, West Virginia
Map 1-1
Boundaries
Approved Refuge Acquisition Boundary
Easement
Owned
Lakes, Ponds, Streams

The U.S. Fish and Wildlife Service and its Mission

The Service, part of the Department of the Interior, administers the Refuge System. The Service's mission is

> *"Working with others to conserve, protect and enhance fish, wildlife and plants and their habitats for the continuing benefit of the American people."*

Congress entrusts the Service with the conservation and protection of national resources such as migratory birds and fish, Federally listed endangered or threatened species, inter-jurisdictional fish, and certain marine mammals. The Service also manages national wildlife refuges and national fish hatcheries, enforces Federal wildlife laws and international treaties on importing and exporting wildlife, assists with State fish and wildlife programs, and helps other countries develop wildlife conservation programs.

The Service manual contains the standing and continuing directives to implement its authorities, responsibilities, and activities. You can access it at *http://www.fws.gov/policy/direct.html.*

The Refuge System is the world's largest collection of lands and waters set aside specifically for conserving wildlife and protecting ecosystems. Over 550 national wildlife refuges encompassing more than 150 million acres are part of the national network today. Refuges are found in every state and several island territories. Each year, more than 40 million visitors hunt, fish, observe and photograph wildlife, or participate in environmental education or interpretation activities on refuges.

In 1997, Congress passed the Refuge Improvement Act. That act establishes a unifying mission for the Refuge System, a new process for determining compatible public use activities on refuges, and the requirement to prepare CCPs for all refuges. It states that first, the Refuge System must focus on wildlife conservation. It further states that the mission of the Refuge System, coupled with the purpose(s) for which a refuge was established, will provide the principal management direction for that refuge.

The mission of the Refuge System is

> *"To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." (Refuge Improvement Act; Public Law 105-57)*

In addition, the Service released its mission policy. Among its main points are conserving a diversity of fish, wildlife, plants, and a network of their habitats; conserving unique ecosystems within the nation; providing and enhancing opportunities for compatible, wildlife-dependent recreation; and fostering public understanding and appreciation of those resources.

Fulfilling the Promise
A yearlong process involving teams of Service employees who examined the Refuge System within the framework of "Wildlife and Habitat, People and Leadership" culminated with "Fulfilling the Promise: The National Wildlife Refuge System," a vision for the Refuge System. The first-ever Refuge System Conference in Keystone, CO, in October 1998 was attended by every refuge manager in the country, other Service employees, and scores of conservation organizations. Many "Promises Teams" formed to develop strategies for

implementing the 42 recommendations of the conference report. Information from such teams as wildlife and habitat, goals and objectives, strategic growth of the Refuge System, invasive species, and inventory and monitoring helped guide the development of the goals, strategies, and actions in this final CCP.

Refuge System Planning Policy
This policy establishes requirements and guidance for Refuge System planning, including CCPs and step-down management plans. It states that we will manage all refuges in accordance with an approved CCP which, when implemented, will achieve refuge purposes; help fulfill the Refuge System mission; maintain and, where appropriate, restore the ecological integrity of each refuge and the Refuge System; help achieve the goals of the National Wilderness Preservation System and the National Wild and Scenic River System; and conform to other mandates [Fish and Wildlife Service Manual (602 FW 1,2,3)].

Appropriate Refuge Uses Policy
This policy provides a national framework and procedure for refuge managers to follow in deciding whether uses are appropriate on a refuge. It also clarifies and expands on the compatibility policy (603 FW 2.10D) by describing when refuge managers should deny a proposed use without determining compatibility. When we find a use is appropriate, we must then determine if the use is compatible before we allow it on a refuge. This policy applies to all proposed and existing uses in the Refuge System only when we have jurisdiction over the use, and does not apply to refuge management activities or situations where reserved rights or legal mandates provide we must allow certain uses (603 FW 1). Appendix B further describes the Appropriate Refuge Uses Policy and describes its relationship to the CCP process.

Compatibility Policy
Federal law and Service policy provide the direction and planning framework to protect the Refuge System from incompatible or harmful human activities and ensure that visitors can enjoy its lands and waters. The Refuge Improvement Act is the key legislation regarding management of public uses and compatibility. The act declares that all existing or proposed public uses of a refuge must be compatible with refuge purpose(s). The refuge manager determines compatibility after evaluating an activity's potential impact on refuge resources, and ensuring that it supports the Refuge System mission and does not materially detract from, or interfere with, refuge purpose(s). The act also stipulates six wildlife-dependent public uses that are to receive enhanced consideration in CCPs: hunting, fishing, wildlife observation and photography, and environmental education and interpretation. Compatibility determinations remain in effect for 10 or 15 years, depending on whether the use is a priority public use, but may be revisited sooner than the mandatory expiration date if new information reveals unacceptable adverse impacts or safety concerns. The compatibility determinations for the Canaan Valley refuge can be found in appendix B along with additional information on the process.

Biological Integrity, Diversity, and Environmental Health Policy
This policy provides guidance on maintaining or restoring the biological integrity, diversity, and environmental health of the Refuge System, including the protection of a broad spectrum of fish, wildlife, and habitat resources found in refuge ecosystems. It provides refuge managers with a process for evaluating the best management direction to prevent the additional degradation of environmental conditions and to restore lost or severely degraded environmental components. It also provides guidelines for dealing with external threats to the biological integrity, diversity, and environmental health of a refuge and its ecosystem (601 FW 3).

Wildlife-Dependent Recreation Policy
The Refuge Improvement Act establishes that compatible wildlife-dependent recreational uses (hunting, fishing, wildlife observation and photography, and environmental education and interpretation) are the priority general public uses of the Refuge System, and are to receive enhanced consideration over other public uses in refuge planning and management. The Wildlife Dependent Recreation Policy (605 FW 1) explains how we will provide visitors with opportunities for those priority public uses on units of the Refuge System and how we will facilitate them. We are incorporating this policy as Part 605, chapters 1-7, of the Service Manual. Also, the General Guidelines for Wildlife-Dependent Recreation, as written in the Service Manual, says we will strive to meet the following criteria for a quality wildlife-dependent recreation program: 1) promotes safety of participants, other visitors, and facilities; 2) promotes compliance with applicable laws and regulations and responsible behavior; 3) minimizes or eliminates conflict with fish and wildlife population or habitat goals or objectives in an approved plan; 4) minimizes or eliminates conflicts with other compatible wildlife-dependent recreation; 5) minimizes conflicts with neighboring landowners; 6) promotes accessibility and availability to a broad spectrum of the American people; 7) promotes resource stewardship and conservation; 8) promotes public understanding and increases public appreciation of America's natural resources and our role in managing and conserving these resources; 9) provides reliable/reasonable opportunities to experience wildlife; 10) uses facilities that are accessible to people and blend into the natural setting; and 11) uses visitor satisfaction to help define and evaluate programs.

Bird Conservation Region 28
North American Bird Conservation Initiative (NABCI) is a coalition of a great number of governmental agencies, private organizations, academic organizations, and private industry leaders in Canada, the United States, and Mexico. It was formed to address the need for coordinated bird conservation that will benefit "all birds in all habitats." NABCI aims to ensure the long-term health of North America's native bird populations by increasing the effectiveness of existing and new bird conservation initiatives, enhancing coordination among the initiatives, and fostering greater cooperation among the continent's three national governments and their peoples.

NABCI's approach to bird conservation is regionally based, biologically driven, and landscape-oriented (NABCI 2000). It draws together the major bird conservation plans already in existence for waterbirds, shorebirds, waterfowl, and landbirds, fills in knowledge gaps, and builds a coalition of groups and agencies to execute the plans.

Bird Conservation Regions (BCRs) are ecologically distinct regions in North America with similar bird communities, habitats, and resource management issues. The Canaan Valley refuge lies within BCR 28 (The Appalachian Mountains). This region includes the Blue Ridge, the Ridge and Valley Region, the Cumberland Plateau, the Ohio Hills, and the Allegheny Plateau. Ecologically this is a transitional area, with forested ridges grading from primarily oak-hickory forests in the south to northern hardwood forests further north. Pine-oak woodlands and barrens and hemlock ravine forests are also important along ridges, whereas bottomland and riparian forests are important in the valleys, which are now largely cleared for agricultural and urban development. BCR 28 is further broken down into smaller physiographic regions by Partners in Flight (see page 1-9).

The primary purposes of BCRs, proposed by the mapping team in 1998 and approved in concept by the U.S. Committee in 1999, are to

- facilitate communication among the bird conservation initiatives;
- systematically and scientifically apportion the U.S. into conservation units;
- facilitate a regional approach to bird conservation;
- promote new, expanded, or restructured partnerships; and
- identify overlapping or conflicting conservation priorities.

As integrated bird conservation progresses in North America, BCRs should ultimately function as one of the primary units within which biological foundation issues are resolved, landscape configuration of sustainable habitats is designed, and priority projects are originated.

North American Waterfowl Management Plan (update 2004)
This updated plan among the United States, Canada, and Mexico outlines their strategy to sustain or restore waterfowl populations through habitat protection, restoration, and enhancement. The 2004 update to the North American Waterfowl Management Plan (NAWMP) outlines population goals for 14 species, species groups, or races of ducks and 34 populations within 7 species of geese (NAWMP 2004). As with the original 1986 plan, its implementation will be accomplished at the U.S. regional level in 11 habitat joint venture areas and three species joint ventures: arctic goose, black duck, and sea duck. Habitat joint ventures are the primary mechanisms for accomplishing plan objectives. Species joint ventures are intended to assist plan implementation by improving scientific information necessary to effectively manage waterfowl populations. Joint venture partnerships involving Federal, State and provincial governments, tribal nations, local businesses, conservation organizations, and individual citizens have been assembled to facilitate and coordinate protecting habitat within the joint venture areas. To implement the plan, these population goals have been translated into habitat protection goals. The 2004 update includes the habitat protection and restoration estimates (in acres) established by each habitat joint venture partnership.

Canaan Valley refuge lies within the boundaries of the newly formed Appalachian Mountains Joint Venture (AMJV). Until recently, the refuge was considered part of the Atlantic Coast Joint Venture (ACJV), and it was the ACJV that we relied upon for assistance during this planning process. However, in the future, we will look to the AMJV for guidance on and suggestions for bird management options.

Originally, the ACJV focused on protecting and managing priority wetland habitats for migration, wintering, and production of waterfowl, with special consideration to black ducks. Benefits to other wildlife in the joint venture area were also included, but were secondary to waterfowl. This goal has since been expanded. Now the ACJV *"is a partnership focused on the conservation of habitat for native birds in the Atlantic Flyway of the United States from Maine south to Puerto Rico."* (ACJV 2004). This broadened perspective is consistent with other major national and continental bird conservation plans and the NABCI discussed previously in this chapter. The ACJV coordinates planning and delivery of bird habitat conservation in this area to improve efficiency and efficacy of recovery and restoration efforts using a sound biological foundation. The AMJV shares a similar methodology and mission: "to restore and sustain viable populations of native birds and their habitats in the Appalachian Mountains Joint Venture through effective, collaborative partnerships" (AMJV 2007).

You can access the various plans (including the NAWMP plan and updates) at *http://www.nawmp.ca/eng/pub_e.html.* We used them as a basis for evaluating waterfowl and other native bird management opportunities on the refuge.

Partners in Flight Bird Conservation Plan: Physiographic Area 12, Mid-Atlantic Ridge and Valley
In 1990, Partners in Flight (PIF) was conceived as a voluntary, international coalition of government agencies, conservation organizations, academic institutions, private industry, and other citizens dedicated to reversing the trends of declining bird populations and to "keeping common birds common." The foundation of PIF's long-term strategy for bird conservation is a series of scientifically based bird conservation plans, using physiographic provinces as planning units. The goal of each PIF plan is to ensure long-term maintenance of healthy populations of native birds, primarily nongame landbirds. Within each physiographic area, the plans rank bird species according to their conservation priority, describe desired habitat conditions, develop biological objectives, and recommend conservation actions. Habitat loss, population trends, and vulnerability of a species and its habitats to regional and local threats are all factors used in the priority ranking (Pashley et al. 2000).

Canaan Valley refuge lies in the Mid-Atlantic Ridge and Valley Physiographic Province, Bird Conservation Area (BCA) 12. The PIF Bird Conservation Plan for the Mid-Atlantic Ridge and Valley (PIF 2003) provides a broad description of the area and associated habitats, identifies priority bird species and habitats, and describes habitat protection objectives (in acres) deemed necessary to support the various bird species associated with each habitat. In addition, the plan outlines other conservation recommendations and needs for bird species within the area. In all, 50 priority breeding-species of birds have been identified for BCA 12. Protecting these species will require a balanced mix of grasslands, shrub-scrub, forested wetlands, non-forested wetlands, and forested uplands habitats.

The final Area 12 PIF plan is available at *http://www.partnersinflight.org.* We referred to this plan as we considered management opportunities on the refuge and to help compile a list of birds of conservation concern for appendix A, "Species of Conservation Concern."

Region 5 Birds of Conservation Concern (2008)
The Birds of Conservation Concern (BCC) plan, updated every five years by our Division of Migratory Birds, identifies nongame migratory birds that, without conservation action, are likely to become candidates for listing under the ESA. The BCC compiles the highest ranking species of conservation concern from these major nongame bird conservation plans: PIF (species scoring >21), U.S. Shorebird Conservation Plan (species ranking 4 or 5), and North American Waterbird Conservation plan (species ranking 4 or 5). This report can be accessed online at *http://www.fws.gov/migratorybirds/NewReportsPublications/SpecialTopics/BCC2008/BCC2008.pdf.*

We used the BCC list in compiling appendix A and to help us focus on which species might warrant special management attention. We also used the final Area 12 PIF plan to help generate the list of birds of conservation concern in appendix A.

American Woodcock Conservation Plan (2008)
The American Woodcock Conservation Plan (Kelley & Williamson 2008) emerged from the efforts of the Service, State wildlife management agencies, and non-governmental organizations known as the *Woodcock Task Force.* Significant declines in woodcock populations since the 1970s are largely due

to the loss of early successional habitat, as well as changes in land use and forestry practices. The plan outlines recommendations for halting this decline in woodcock populations and for returning them to densities which provide adequate recreational opportunities. Overall, the plan's objective is to increase populations by increasing the amount of suitable habitat available.

We referenced this plan when writing goals and objectives for this CCP. The plan is available for download on the Service's Migratory Bird Division's website at *http://www.timberdoodle.org/sites/default/files/woodcockPlan_0.pdf.*

Regional Wetlands Concept Plan—Emergency Wetlands Resources Act (Emergency Wetlands Resources Act of 1986, 16 U.S.C. 3901(b))
In 1986, Congress enacted the Emergency Wetlands Resources Act to promote the conservation of our nation's wetlands. The Act directs the Department of the Interior to develop a National Wetlands Priority Conservation Plan identifying the location and types of wetlands that should receive priority attention for acquisition by Federal and State agencies using Land and Water Conservation Fund appropriations.

In 1990, our Northeast Region completed a Regional Wetlands Concept Plan to provide more specific information about wetlands resources in the Northeast. It identifies 850 wetland sites that warrant consideration for acquisition to conserve wetland values in our region (USFWS 1990b).

The Northeast Regional Wetlands Concept Plan identifies wetlands located within the refuge, Canaan Valley, as well as Dobbins Slashings, and Elder Run Bog which are both located in Tucker County. We used this plan to help identify areas in need of long-term protection in the watershed, and to prioritize wetlands habitat management on the refuge.

Eastern Brook Trout Conservation
There are multiple organizations concerned with the conservation of the eastern brook trout, and two in particular have written plans and strategies which apply to Canaan Valley.

The Eastern Brook Trout Joint Venture (EBTJV) is an organization composed of State and Federal agencies, regional and local governments, businesses, conservation organizations, academia, scientific societies, and private citizens. Their vision is "to ensure healthy, fishable brook trout populations throughout their historic eastern United States range."

Their conservation plan, written in November 2007, consists of four principal goals and five key priorities which serve as the framework for the development of State-level brook trout conservation action plans. These key priorities are to

- protect brook trout populations across the eastern United States;
- restore brook trout populations where original habitat conditions exist and where habitats can be restored;
- monitor and evaluate brook trout population responses to habitat protection, enhancement, and restoration projects;
- complete brook trout distribution and quantitative status assessments; and
- increase regional fishing opportunities for wild brook trout.

The EBTJV conservation plan is online at *http://www.easternbrooktrout.org/.*

The State of West Virginia also developed a group, called the West Virginia Brook Trout Conservation Group (Conservation Group) in 2006 to compile a State conservation strategy which would focus resources, build partnerships, and promote local action to restore brook trout habitat.

The Conservation Group is composed of individuals representing West Virginia University, U.S. Geologic Survey (USGS), West Virginia Division of Natural Resources (WVDNR), Trout Unlimited, the Freshwater Institute, U.S. Forest Service, and the U.S. Fish and Wildlife Service. They met from February to June 2006 to write the West Virginia Brook Trout Conservation Strategy (strategy).

The strategy outlines a conservation goal, as well as various conservation priorities to be addressed. They further broke down the priorities into strategies to be implemented. The goal of the Conservation Group is to "Implement statewide strategies that protect, restore, and enhance healthy brook trout populations in West Virginia."

The listed priorities are:

- habitat and population protection;
- habitat and population restoration and enhancement;
- assessment, monitoring and research;
- outreach, partnerships, and capacity building; and
- enhanced socio-economic value to the State.

The strategy written by the Conservation Group can be found online at *http://www.easternbrooktrout.org/.*

Recovery Plan for the Cheat Mountain Salamander
On September 28, 1989, the Cheat Mountain salamander *(Plethodon nettingi)* was listed as threatened on the Federal list of endangered and threatened wildlife (USFWS 1991).

There are 80 disjunct populations of Cheat Mountain salamander throughout the known range. To date, surveys have been conducted at 499 sites within their range, with salamanders found in 80 disjunct populations. During surveys conducted in 1980 and 1989, two known historical populations were found to be extirpated, and during surveys in 1980, 1985, and 1989, fewer than ten specimens were uncovered in 51 of the 68 sites.

Since its listing as a threatened species, the U.S. Forest Service and U.S. Fish and Wildlife Service have required onsite surveys for the salamander on Federal lands and in areas being considered for development. According to the recovery plan, their recovery strategy began by obtaining an accurate overview of the species by determining its total range and searching for additional populations. More specific goals listed in the plan include:

- define total range of the species;

- survey additional areas within the known range to gain additional information about the species' distribution and abundance;

- monitor known populations to determine their status, territoriality; home range, environmental changes, and competitive pressure;

Ken Sturm/USFWS

Cheat Mountain Salamander

- assess population characteristics;
- determine the effects of human-induced habitat alterations; and
- determine biological factors such as reproductive biology, growth rates, and genetic variability among populations.

Canaan Valley refuge surveys for Cheat Mountain salamanders annually, and they have been found on three separate locations on the refuge.

The Cheat Mountain salamander recovery plan is online at *http://ecos.fws.gov/docs/recovery_plan/910725.pdf.*

Recovery Plan for the Indiana Bat
In 1967, the Federal Government listed the Indiana bat *(Myotis sodalist)* as endangered because of declines in their numbers documented at their seven major hibernacula in the Midwest (USFWS 2007a).

Canaan Valley refuge falls in an area with known summer and winter records of the Indiana Bat. The refuge has conducted acoustical bat surveys since 2005. Additionally, surveys were performed in collaboration with the U.S. Forest Service Northern Forest Research Station in 2003. The data collected presented compelling evidence of this species foraging on refuge property, and importantly, outside of migration periods. Evaluation of potential Indiana bat use of the Canaan Valley will be a priority of the Canaan Valley refuge, and this species should be considered as a likely occurrence in the southern portion of the watershed, including the properties in Timberline Resort.

The recovery plan for the Indiana bat can be viewed online: *http://ecos.fws.gov/docs/recovery_plan/070416.pdf.*

Other Species of Concern
The West Virginia northern flying squirrel, which occurs in refuge forests, was de-listed as an endangered species in September 2008. The squirrel has been successfully trapped and monitored at one location on the refuge but is expected to range throughout the higher elevations of the Kelly-Elkins Tract. The Service developed a Red Spruce-Northern Hardwood Ecosystem Memorandum of Understanding (MOU) with multiple Federal, State and non-government organization (NGO) partners. The vision of the MOU specifically includes the need to "… provide functional habitat to sustain the viability of the West Virginia northern flying squirrel…" (USFWS 2007b). As an active partner in the MOU, the refuge will still consider the West Virginia northern flying squirrel a focal species.

The bald eagle, delisted in August 2007, uses the refuge during winter months and migration. Bald eagles are still protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act and remain a species of management priority for the Service. Bald eagles use the refuge primarily from late fall to early spring. Generally bald eagles observed are juveniles; however, adults are seen each year. Up to six bald eagles have been observed together on the refuge at one time. Typically eagles are seen singly during winter months foraging over the wetland areas in the northern portion of the refuge. No known nesting occurs in the vicinity of Canaan Valley.

Both the West Virginia northern flying squirrel and the bald eagle, although delisted, remain priority species for Service protection and management.

West Virginia Wildlife Conservation Action Plan (West Virginia 2006)
State fish and wildlife agencies have been required to develop comprehensive wildlife conservation strategies focusing on "species of greatest conservation need" in order to be eligible for funds from the State wildlife grant program. That program provides Federal funds to states for conservation efforts aimed at preventing fish and wildlife populations from declining, reducing the potential for these species to be listed as endangered.

West Virginia's plan, called the West Virginia Wildlife Conservation Action Plan (WVCAP), was revised several times; the latest revision occurred in 2006. The WVCAP divides the State into three physiographic provinces. Canaan Valley refuge is located in the landscape region known as the Western Allegheny Plateau. The WVCAP further breaks down the map into various habitat types. Canaan Valley lies mainly in the Red Spruce Forest and Northern Hardwood Forests habitats.

In identifying the species in greatest need of conservation, the WVCAP compiles information from concern lists created by a variety of different organizations, including the Service, WVDNR, Natural Heritage Program, The World Conservation Union, Convention on International Trade in Endangered Species of Wild Flora and Fauna, West Virginia PIF, National Audubon Society, and others. The Cheat Mountain salamander, West Virginia northern flying squirrel, and the Indiana Bat are all identified as wildlife of greatest conservation need within the Canaan Valley refuge landscape.

Refuge Purposes and Land Acquisition History

Canaan Valley Refuge Establishing Legislation

Refuges can be established by Congress through special legislation, by the President through executive order, or administratively by the Secretary of the Interior (delegated to the Director of the Service), who is authorized by congress through legislation. Refuge System lands have been acquired under a variety of legislative and administrative authorities.

The Service first considered establishing a national wildlife refuge in Canaan Valley, Tucker County, West Virginia in 1961, when a biological survey of the valley's nationally significant wetlands and wildlife habitat was conducted. Additional field reconnaissance was undertaken in 1976, and realty and biological reconnaissance reports were prepared. In April 1977, the Director of the Service selected a proposal for consideration and directed commencement of an environmental impact review.

An Environmental Impact Statement (EIS) was prepared for the refuge proposal in accordance with the requirements of NEPA. The EIS described the proposed action and discussed its environmental impacts, unavoidable adverse effects, the relationship between short-term use and long-term productivity, and commitments of resources, as specified in Section 102 of NEPA. The EIS also considered four alternatives to the proposed action.

Copies of the Draft EIS were provided to the public, appropriate Federal, State, and local agencies for comment on March 24, 1978. Those comments were reviewed and considered in finalizing the EIS. The Service concluded this project planning/public review phase with the approval of the Final EIS on May 30, 1979.

With that action, the Service approved the establishment of the refuge, as authorized and directed by the Fish and Wildlife Act of 1956 (16 U.S.C. 742a-742j), as amended. Section 7(a) of the Act (16 U.S.C. 742f) authorizes the Secretary of the Interior to take steps "required for the development, advancement, management, conservation, and protection of fish and wildlife resources including, but not limited to, research, development of existing facilities, and acquisition by purchase or exchange of land and water or interests therein." Section 7 (a)(1) of the Land and Water Conservation Fund Act of 1965, as amended, September 28, 1976, (16 U.S.C. 4601-9) provides authority to use Land and Water Conservation Fund (LWCF) money for acquisition of refuge areas under paragraph (5) of section 7(a) of the 1956 Act. This administrative action resulted in an approved land acquisition boundary, encompassing 28,000 acres, within which lands could be acquired for the refuge according to the policy described in the Proposed Action section of the EIS.

The actual establishment of the refuge was delayed due to the proposal to create a hydroelectric power project in the area that involved the major land ownerships within the acquisition boundary. The largest single landholding within the boundary consisted of a 15,000-acre tract owned by Allegheny Power Systems, Inc./Monongahela Power Company. This tract includes a major portion of the large unique wetland ecosystem and surrounding undeveloped lands located in the central and northern portion of Canaan Valley.

In April 1977, the Federal Power Commission (now Federal Energy Regulatory Commission, FERC) licensed Allegheny Power to construct the Davis Power Project, a pumped storage hydroelectric project. The proposed power project would have inundated approximately 4,400 acres of wetlands and about 2,900 acres of terrestrial habitat. On July 14, 1978, the power project permit, required under Section 404 of the Clean Water Act, was denied by the U.S. Army Corps of Engineers because of the project's extensive adverse impacts to wetlands. A period of litigation ensued, involving several appeals. The situation was not resolved until 1988, at which time the U.S. Supreme Court chose not to review a U.S. Court of Appeals decision that a Clean Water Act permit was required [cert. denied. 484 U.S. 816 (1987)]. On April 29, 1991, FERC granted Allegheny Power's request for a stay of the project license based, "… on the lack of viability of the project."

During this period, the Service did not proceed with acquisition of any lands or request funding for that purpose. Public outreach, via field tours, presentations, media contacts, etc., continued throughout the period. In 1991, the Service proposed boundary modifications in the southern end of the refuge in response to concerns expressed by local government officials and owners of developed properties in the valley. Areas which were originally included within the project boundary because of their biological importance were deleted because their habitat value had been compromised as a result of development. These lands were removed from the boundary since the Service had no interest in acquiring developed lands, thereby reducing the total approved acquisition boundary to 24,000 acres.

With the U.S. Supreme Court ruling and the granting of the license stay, the Service developed a final environmental assessment in 1994 to determine if any substantial changes had been made to the proposed action, or if circumstances or new information relevant to the environmental concerns were still within the scope of the EIS. Based on that review and the Service's determination that the project modification and intervening developments were of minor effect on the basic project, the Service determined that a supplemental environmental impact statement would not be necessary. The Service therefore proceeded with the next step in the refuge establishment process and submitted a request for funding. The proposed refuge received renewed support from the WVDNR, the U.S. Environmental Protection Agency (EPA), many other agencies and conservation organizations, and local governments and citizens.

Canaan Valley refuge was established when the Freeland Tract was purchased on September 11, 1994. Through various purchases between 1994 and 2001, the refuge slowly grew to just over 3,000 acres in size. In February 2002, the refuge acquired just under 12,000 acres from Allegheny Power Systems, including much of the wetlands in the central part of the valley. This purchase brought the acreage of the refuge to 15,245.

Canaan Valley Refuge Purposes

The refuge was established to ensure the ecological integrity of Canaan Valley and the continued availability of its wetland, botanical, and wildlife resources to the citizens of West Virginia and the United States. It has the largest wetland complex in both West Virginia and the central and southern Appalachians, encompassing over 8,400 acres,. The wetland is listed as a priority for protection under the Emergency Wetlands Resources Act of 1986, as implemented by the Service's Regional Wetlands Concept Plan, and considered by the State of West Virginia as "the most important wetland in the State."

The Service established the refuge for the following additional purposes and under the following authorities:

"... for the development, advancement, management, conservation, and protection of fish and wildlife resources..." (Fish and Wildlife Act of 1956; 16 U.S.C. 742f(a)(4));

"... the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions" (Emergency Wetlands Resources Act of 1986; 16 U.S.C. 3901(b));

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. 715d (Migratory Bird Conservation Act of 1929).

Mary Konchar

Nature hike at Canaan Valley National Wildlife Refuge

Refuge Operational Plans ("Step-Down" Plans)

The U.S. Fish and Wildlife Service Manual, Part 602, Chapter 4 (Refuge Planning Policy) lists more than 25 step-down management plans that are generally required on refuges. Those plans "step down" general goals and objectives to specific strategies and implementation schedules. Some require annual revisions; others are revised on a 5- to 10-year schedule. Some require additional NEPA analysis, public involvement, and compatibility determinations before they can be implemented.

The following step-down plans have been completed and approved as follows:

- Hunt Management Plan (1997) revised 2007
- Fire Management Plan (2005)
- Fur Bearer Management Plan (2004)
- Continuity of Operations Plan (2007)
- Fire Prevention Plan (2007)
- Hurricane Action Plan (2007)
- Emergency Action Plan (2007)
- HPAI: Avian Influenza Plan (2006)
- Chronic Wasting Disease Plan (2006)

The following step-down plans need to be completed:

- Visitor Services Plan
- Habitat Management Plan
- Fishing Plan
- Inventory and Monitoring Plan

Refuge Vision Statement

Early in the planning process, our team developed the following vision statement to provide a guiding philosophy and sense of purpose for our planning.

Ken Sturm/USFWS

Deer mouse tracks in the snow

Canaan Valley National Wildlife Refuge showcases the largest contiguous, high elevation wetland complex in West Virginia and harbors a vast assemblage of rare plants and animals normally associated with more northern latitudes. The refuge conserves, protects, and manages a mosaic of wetland, forested, and early successional habitat that supports migratory birds and threatened and endangered species. As a steward of a significant portion of the headwaters, the Refuge ensures the integrity of the natural resources of the upper Blackwater River watershed. Refuge habitats and wildlife are conserved and managed through research and collaboration with Federal, State, and local conservation partners.

As an integral part of the surrounding community, the Refuge provides high quality, safe, wholesome, and diverse opportunities for education and recreation, especially hunting and wildlife observation. The refuge experience fosters public interest in the beauty and unique character of Canaan Valley, an appreciation of fish and wildlife ecology, plant ecology, and stewardship of the natural world. Visitors develop a greater understanding and appreciation for the mission of the National Wildlife Refuge System and refuge management programs, and for the importance of protecting lands for wildlife conservation.

Ken Sturm/USFWS

Canada geese

Refuge Goals

Our planning team developed the following goals for the refuge after a review of legal and policy guidelines, the Service mission, regional plans, refuge purposes, our vision for the refuge, and public comments. All of these goals fully conform with and support national and regional mandates and policies.

1) Maintain and perpetuate the ecological integrity of the Canaan Valley wetland complex to ensure a healthy and diverse wetland ecosystem providing a full range of natural processes, community types, and native floral and faunal diversity.

2) Perpetuate the ecological integrity of upland northern hardwood and northern hardwood-conifer forests to sustain native wildlife and plant communities including species of conservation concern, to develop late-successional forest characteristics, and to perpetuate the biological diversity and integrity of upland forest ecosystems.

3) Provide and promote through active management a diversity of successional habitats in upland and wetland-edge shrublands, grasslands, old fields, and hardwood communities to sustain early successional and shrubland specialists such as golden-winged warbler, American woodcock, brown thrasher, eastern towhee, field sparrow, and other species of concern.

4) Enable visitors of all abilities to enjoy opportunities for wildlife-dependent recreation and education to enhance public appreciation, understanding, and enjoyment of refuge habitats, wildlife, and cultural history.

5) Collaborate with partners to promote the natural resources of Canaan Valley and the mission of the National Wildlife Refuge System.

Chapter 2

Ken Sturm/USFWS

Female chalk-fronted corporal

The Comprehensive Conservation Planning Process

- Planning Process
- Issues and Opportunities
- Issues Outside the Scope of this Final CCP
- Plan Amendment and Revision

Service policy establishes an eight-step planning process that also facilitates compliance with NEPA. Although that figure suggests those steps are discrete, two or three steps can happen at the same time. Each of the eight steps is described in detail in the planning policy and CCP training materials.

Planning Process

We began planning for Canaan Valley refuge in 2006. Our early meetings consisted of getting acquainted with the planning process and collecting information on natural resources and public use. We identified preliminary issues and management concerns, and developed refuge vision statements and preliminary goals. Figure 2.1 describes the steps of the planning process and how it integrates NEPA compliance.

We hosted public open houses in October 2006 in Thomas, Parsons, and Elkins, and in January 2007 in Canaan Valley. We then distributed a workbook and issues survey to neighbors, visitors, and other interested parties during the fall and winter of 2006. A total of 2,000 workbooks were sent out and 129 were returned with comments. Our purpose was to provide local residents and other interested individuals the opportunity to become involved in the comprehensive conservation planning process. The responses we received on protecting resources and providing public use helped influence our development of issues and alternatives.

Following the public open houses, we hosted a series of field meetings with resource professionals from The Nature Conservancy, Canaan Valley Institute, the U.S. Forest Service, WVDNR, National Park Service, and West Virginia University, as well as recreational user groups to discuss some of the issues related to public use and habitat management on Canaan Valley refuge.

Between January and July 2007, these specialist groups met to discuss rare plant and natural community conservation, deer management, migratory bird management, educational and interpretation opportunities and other wildlife-dependent recreational uses of the refuge. These meetings helped refuge staff to communicate with our State, Federal, and NGO partners concerning the direction of the refuge over the next 15 years.

In the winter of 2007, the Service sponsored a stakeholder evaluation conducted by the Policy Analysis and Science Assistance Branch of the U.S. Geological Survey (USGS). This provided us with a way to more fully understand community preferences and opinions related to key topics in refuge planning.

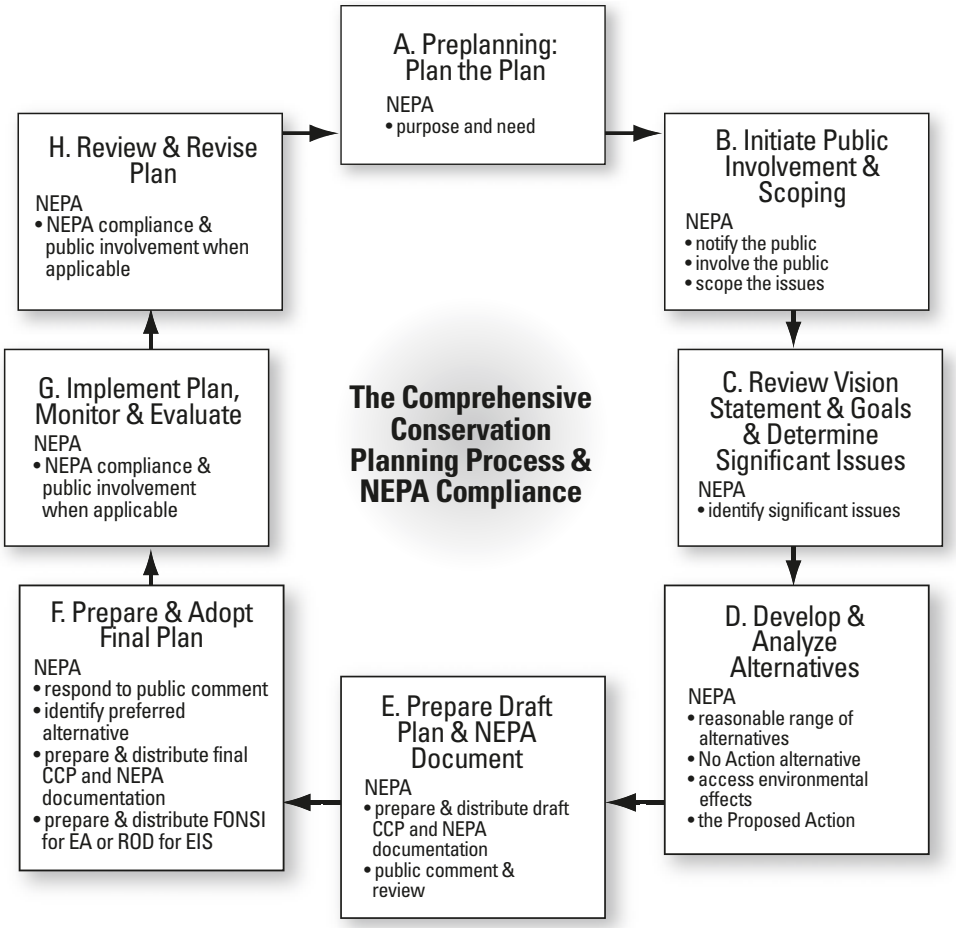
We distributed newsletters in February 2008 and April 2009 to our entire mailing list, updating everyone on our progress.

In May 2010, we distributed a newsletter announcing the upcoming release of the draft Comprehensive Conservation Plan and Environmental Assessment (draft CCP/EA). On June 1, 2010, we published a Notice of Availability in the Federal Register announcing the release of the draft CCP/EA, and thus began a 45-day period of public review and comment. During that 45-day period, we held seven public comment meetings: two on June 15 in Canaan Valley, WV; two on June 16 in Parsons, WV; two on June 17 in Elkins, WV; and one on June 28 in Davis, WV. At these meetings, refuge staff gave a short presentation highlighting the important points of the draft CCP/EA, after which members of the public offered oral comments on the document.

After the comment period closed on July 16, 2010, we then reviewed and analyzed all of the written and oral comments. Appendix J summarizes those public comments and our responses to them. In some cases, our response includes modifications to alternative B, our preferred alternative. These modifications take

the form of additions, corrections, or clarifications, which we have incorporated into this final CCP.

Figure 2.1. The Comprehensive Conservation Planning Process and its relationship to the National Environmental Policy Act of 1969.



Our Regional Director has signed a Finding of No Significant Impact (FONSI) (appendix K), which certifies that this final CCP has met agency compliance requirements, and will achieve refuge purposes and help fulfill the Refuge System mission. It also documents his determination that implementing this CCP will not have a significant impact on the human environment and, therefore, an Environmental Impact Statement (EIS) is not required. We will make these documents available to all interested parties. Implementation can begin immediately.

We will evaluate our accomplishments under the CCP each year. More intensive monitoring is proposed for each program area. If future monitoring or new information results in the predication of a significant impact, it will require additional analysis.

Issues and Opportunities

From the issues workbook, public and focus group meetings, stakeholder survey, and planning team discussions, we developed a list of issues, concerns, opportunities, or other items requiring a management decision. We sorted them into two categories:

Key issues

These were unresolved public, partner, or Service concerns without obvious solutions supported by all at the start of our planning process. Along with the goals, the key issues formed the basis for developing and comparing the four different management alternatives in the draft CCP/EA. The key issues listed below also share this characteristic: The Service has the jurisdiction and the authority to address them.

How will the refuge provide quality hunting and fishing opportunities for the public?
Hunting and fishing are two of the priority public uses that receive enhanced consideration in CCPs. Hunting and fishing are also historical, traditional, and very popular activities in the Canaan Valley area, in the State of West Virginia and in the Refuge System.

Fishing
The refuge previously had no approved fishing plan. The refuge allows anglers to access fishing areas via established trails that are open to public use. Fishing in these areas is conducted according to State regulation. The State regularly stocks the Blackwater River along Rt. 32, along Timberline Road, and in Canaan Valley Resort State Park. There are no special refuge regulations for fishing. Some anglers would like to be allowed off-trail access on the refuge, just as hunters are. Through the planning process, the Service has decided to officially open the refuge to fishing. Refuge Goal 4 addresses this issue in more detail.

Hunting
Approximately 98 percent of the refuge is currently open to hunting, with most seasons following the State seasons. In particular, the refuge has been concerned about the large local deer population and its impact on refuge habitats. The refuge has discussed several possibilities for increasing the deer harvest on the refuge, including reassessing areas of the refuge that are either closed completely to deer hunting or that are closed to rifle hunting. In West Virginia, many hunters use all-terrain vehicles (ATVs) to access remote hunting areas and to haul deer out of woods. The State has encouraged the refuge to consider this option, but ATVs are not permitted on the refuge. Some hunters have favored the use of ATVs while others have opposed it. Through the planning process, the refuge has worked with partners to determine how to make some interior parts of the refuge more accessible to hunters.

The refuge could also work with the State to develop special deer hunts on the refuge that would further help reduce the refuge's deer population. Addressing the issue of deer overpopulation would support all five of the refuge's goals and would be integral to the success of several biological goals and objectives. Finally, the refuge could work with other local landowners to help address the deer population on neighboring lands. Refuge Goal 4 addresses our response to this issue in detail.

How will the refuge provide quality wildlife observation and photography opportunities for the public?
The refuge has 31 miles of roads and trails open for public use, and this final CCP expands that trail system even further. This trail system provides access to most habitat types in the valley. Trails are zoned for pedestrian access, biking, horseback-riding, cross-country-skiing and snowshoeing. Pedestrian access is permitted on all trails, but most of the other uses are only permitted on some

of the trails. All these uses support the six priority public uses. Refuge Goal 4 further explains how and where we expand the refuge's trail system through the final CCP.

How will the refuge address Camp 70/Delta Road access?
Camp 70 is a State road that is bordered by refuge land on both sides for the last mile of its length. The road starts at Davis and enters the refuge in the northwest corner, continuing for one mile until it ends at the Camp 70 Loop Trail. The road was historically located on refuge-owned land. No maintenance has been conducted by the West Virginia Department of Highways or refuge staff. Camp 70 is minimally maintained outside of the refuge boundary. The road is currently an open public access route within the refuge's trail system and is therefore open to all foot, bicycle, horseback riding, and vehicle use. Because the road is under State authority, its use is regulated by the State. Therefore all vehicles are permitted on the road. However Camp 70 is an unimproved road that is in poor condition, and is likely impassable without four-wheel-drive and high clearance.

There is interest from the community and stakeholders to keep Camp 70/Delta 13 and the connecting loop trail open to pedestrians, bicycling, horseback riding, and vehicles. The refuge has expressed its desire to acquire this road so that it could invest in improving the road's condition. Goal 4 discusses our future plans for Camp 70/Delta Road.

How will the refuge promote trail connectivity both on and off the refuge?
Despite the 31 miles of roads and trails open to the public on the refuge, there is no east-west or north-south corridor that can take visitors from one end of the refuge to the other. In some areas, sensitive wetlands and lack of continuous refuge land ownership prevent connectivity. Some visitors have asked the refuge to look at different options for connecting the refuge's trails, such as converting old railroad grades that bisect the refuge into public use trails. Visitors have also asked that refuge trails be connected with trails on neighboring conservation lands, such as Canaan Valley State Park.

Connecting trails, both on and off refuge, allows people to travel longer distances for a more rigorous outdoor experience. Some people would also argue that becoming part of a long distance trail system offers a higher quality recreational experience. Longer, connected trails may also minimize the need for motorized vehicles and could contribute to improving air quality. For example, people from urban areas could come to the refuge to participate in multi-day hiking or bicycling trips instead of traveling to more remote locations to have a similar kind of experience. The issue of trail connectivity is addressed in Goal 4.

How will the refuge be managed to protect Federal trust resources?
The lack of suitable red spruce forest and the degraded and isolated condition of the then existing spruce forest were the primary reasons for listing the Cheat Mountain salamander and the West Virginia northern flying squirrel under the Endangered Species Act (ESA). These conditions persist on refuge lands. Although the squirrel has since recovered and has been delisted, the salamander remains a Federally threatened species. Improving the size and connectivity of red spruce forest on the refuge will help long term management and protection of species with the highest need for conservation in the State, such as the salamander and the squirrel. Furthermore, salamander populations have been located on the southern end of the refuge, where White Grass Touring Center (White Grass) operates a commercial cross-country skiing and snowshoeing operation on refuge land. Research related to the salamander has shown that logging roads and some hiking trails can serve as barriers to salamander movement and therefore can result in inhibited genetic dispersal. The refuge is

required by the ESA to improve and restore habitat for Federally listed species when feasible. White Grass provides the largest single source of public use on the refuge during the winter and likely during the entire year. Trails used by White Grass have conditions more conducive to salamander movements (canopy cover, not heavily traveled during spring and summer, vegetated) however habitat improvement projects may be beneficial to the species. The refuge will ensure that permitting public use on the refuge and in cooperation with White Grass will not have any adverse effects to the Cheat Mountain salamander. Further we hope to use White Grass as a conduit to increase the public's understanding of the salamander and other resources of concern the refuge protects and manages.

The Indiana bat is a Federally listed endangered species and a trust resource of the Service. Primary foraging habitats include wetland and riparian areas, bottomland forests and edge habitats. Acoustical recordings suggest Indiana bats are using riparian corridors and beaver ponds on the refuge for summer foraging habitat. The refuge will need to do additional surveys to learn more about the bat's presence, reproductive information, the types of refuge habitats used, and the seasons they are using the refuge habitats. If Indiana bats are foraging and roosting on the refuge then protecting, maintaining and improving habitat quality on the refuge will contribute to the viability of the species and its recovery.

The issue of managing for Federal trust resources is further addressed in Goals 1 and 2.

How will the refuge manage for early successional habitats?
The decline of early successional and transitional forest habitat in the northeast is concurrent with the decline of species dependent on this habitat type (Sauer et al 2007, Fink et al 2006). On a regional scale, loss of small farms, increase of commercial and residential development, suppression of historically important disturbances such as fire, and decrease in large area clear-cutting contribute to the loss of early successional habitat (Brooks 2003, Lorimer 2001, Trani et al 2001). The suite of birds reliant on this habitat type is of high conservation priority in BCR 28 and the State (PIF 2003, WVDNR 2006) and includes American woodcock, Eastern towhee, field sparrow, indigo bunting, and brown thrasher. American woodcock is also a priority species of conservation concern and an important management species for recreational hunters. As a species occurring in Canaan Valley in greater concentration and abundance than other parts of the State and as a priority species for management in founding documents, the refuge identifies woodcock as an important management species.

The refuge is surrounded by forested lands including the Monongahela National Forest (Dolly Sods Wilderness Area) and two State parks where early successional habitat management is not the intent of management actions. In contrast, the refuge's extensive shrublands, old fields, and young forests currently provide early successional and shrubland habitat that is scarce in the region, State, and local area. Refer to Goal 3 for more information on how the refuge will manage for early successional habitat under the final CCP.

Issues Outside the Scope of this Final CCP

South Rail Grade Crossing (Jack Neal's Ford)
The refuge has conducted a series of evaluations to consider the use of the south rail grade for a developed public use trail. Beginning in 2002 refuge staff worked with a contract hydrologist and soil scientist to begin evaluating trail locations for the refuge. In 2007 the refuge contracted with Vanasse Hangen Brustlin, Inc. (VHB) to conduct an independent feasibility study to evaluate the potential of this rail grade to be improved for use as a public use route on the refuge. This report is available to the public on the planning website.

The refuge takes many factors into consideration when evaluating new trail development. These include but are not limited to considerations of wildlife disturbance, introduction of invasive plant species, infrastructure requirements, required maintenance, wetland protection, soil stability and how a proposed trail can help fulfill the priority public uses of the refuge system. One of the refuge's primary considerations is whether a trail can facilitate priority public uses with minimal impact to the resource so as to prevent the use from detracting from the purposes for which the refuge was established.

The Blackwater River crossing of this trail is highly eroded. The bare soil conditions on the river banks require restoration to prevent continued sedimentation of the river. VHB recommended a pedestrian foot bridge be established to prevent future erosion of the river banks and to provide a safe crossing over the Blackwater River under all conditions. Access to this site for bridge construction is limited and would require filling of wetland areas needed to bring equipment to the site. The construction of a bridge would be costly and would require ongoing maintenance.

The western section of the South Rail Grade that crosses the valley and the Blackwater River is extremely eroded after years of vehicle use and flooding. A short section east of the river is generally more stable, however it is also isolated. This would make it challenging to fill and to haul in equipment for building substantial infrastructure, such as a boardwalk, which would be needed to support public use with minimal impact to wetland plant communities and soils. In a longer section leading up to the juncture where the South Rail Grade connects to Middle Ridge, the trail is again highly eroded and has been flooded by beaver activity in recent years. Beaver inundation along the southern portion of the grade has also created weakened sections which show signs of erosion. This section would also require significant infrastructure to make it suitable for public access without causing continued wetland degradation.

Through the VHB study, the refuge determined that the one-time and ongoing monetary and environmental costs to construct and maintain a sustainable trail along the south rail grade crossing were far greater than the benefits to the public of providing this additional public use. The refuge also determined that similar habitats can be viewed from existing refuge trails including Camp 70, Brown Mountain Overlook, Freeland, South Glade Run Crossing and the northern section of the Middle Valley Trail. The refuge also determined that there are multiple opportunities to experience the refuge's wetland habitats in ways that do not impact those habitats nearly as much as a trail on the South Rail Grade crossing would. The risks to the refuge's biological resources through construction, use, and maintenance of such a trail are substantial.

Given the above considerations, the refuge has concluded that this trail is not a realistic or viable option for several reasons, but primarily because the old rail grade is mostly gone and the proposed trail exists almost entirely on wetland soils. It is the refuge's opinion that development of a new trail corridor through the heart of the largest wetland complex in the State of West Virginia would ultimately compromise the purposes of the refuge and affect our ability to fulfill obligations under the Biological Integrity, Diversity, and Environmental Health Policy.

Competitive Races

The refuge periodically receives requests to use Forest Road (FR) 80 for competitive foot, bike and other races because of its connections bridging the Timberline/ Winterset areas, the national forest, and Freeland Road. FR 80 was rebuilt in 2003 and can support car and light truck traffic. The impact to the road itself from a foot or bike race and the supporting vehicles is likely to be small.

However, impacts from such events extend beyond the roadway and can include litter and off-road travel from by-standers. Races are not a wildlife-dependent use, and the presence of the participants, support personnel, and observers can interfere with other users participating in wildlife-dependent recreation. In addition, competitive races do not support any of the priority public uses, and they do not contribute to the purposes of the refuge or the mission of the Refuge System. Therefore, we will continue to deny requests for competitive races along the length of FR 80.

Overnight Camping on the Refuge

Over the years, the refuge has received requests for overnight camping from different groups of users. Hunters have requested overnight camping to facilitate hunting, especially in the more remote areas of the refuge where greater hunting pressure is needed to cull the deer population. Allowing hunters to camp may increase the number of deer taken in the valley, but there are many other factors that contribute to the refuge's large deer population, such as neighboring lands that are closed to hunting and are used by deer as a safe haven.

Hikers have also requested overnight camping to facilitate hiking longer distances through neighboring conservation lands such as Canaan Valley Institute and U.S. Forest Service lands. Other users claim that overnight camping would allow visitors to experience the refuge at nighttime, therefore exposing the public to different aspects of wildlife and their habitats such as mammal movements at dusk, waterfowl roosting, and owls.

In regards to overnight camping, the refuge's primary concern is the permanent disturbance to soils and vegetation around camp sites. Trampling around camp sites is well documented to increase soil compaction, reduce water infiltration, and reduce vegetative cover. Furthermore, the long-term presence of people would cause disturbance to nocturnal animals that rely on the cover of night to forage and hunt. Finally, there would be sanitary issues such as how to deal with human waste.

There are also numerous administrative and law enforcement issues associated with overnight camping. Campers would likely require a special use permit, which would further tax the limited administrative staff at the refuge. The numerous law enforcement issues associated with camping include trash, illegal fires and the creation of spur trails around campsites. It would probably take a full-time law enforcement officer to monitor camp sites for these issues, and the refuge currently only has one law enforcement officer. These additional duties would place an onerous burden on the refuge and would detract from the resources (funding and staff time) currently being used to support activities that contribute to the refuge purposes and the mission of the Refuge System.

In summary, there are many issues related to overnight camping including law enforcement, management of the program and potential habitat and wildlife disturbance. Camping is not a priority public use and although it may facilitate some of the priority public uses, the resources it takes to manage overnight camping far outweigh the benefits from this activity. Additionally there are numerous areas where camping is permitted in close proximity to refuge property. Dispersed camping is permitted in the U.S. Forest Service land to the east and west of refuge boundaries. Camping is also permitted on property managed by the Canaan Valley Institute along Camp 70 Road outside of refuge boundaries. Finally, developed campsites are located at the Canaan Valley State Park and at Blackwater Falls State Park. These resources provide reasonable overnight facilities that allow users to access the refuge during normal hours of operation (one hour before sunrise to one hour after sunset).

Plan Amendment and Revision

Periodic review of the CCP will be required to ensure that we are implementing management actions and are meeting the objectives. Ongoing monitoring and evaluation will be an important part of that process. Monitoring results or new information may indicate the need to change our strategies.

At a minimum, CCPs will be fully revised every 15 years. We will follow the procedures in Service policy and the requirements of NEPA for modifying the CCP, its associated documents, and our management activities as needed.

Chapter 3

Ken Sturm/USFWS

Canaan Valley National Wildlife Refuge

Affected Environment

- Introduction
- Physical Environment
- Regional Economic Setting
- The Refuge and its Resources
- Vegetation and Habitat Resources
- Fisheries Habitats and Resources
- Wildlife
- Special Uses
- Public Access, Education and Recreational Opportunities
- Cultural Resources

Introduction

This chapter describes in detail the physical, cultural, socioeconomic, biological and administrative environments of Canaan Valley National Wildlife Refuge (Canaan Valley refuge; refuge) and its surrounding environs. It relates those resources to our refuge goals and key management issues, and provides context for our management direction, which we present in chapter 4.

Physical Environment

Elements of the physical environment considered include climate, hydrology, geology, soils, and contaminants.

Climate

The climate is cool and moist resulting from the geography and elevation of the valley. Temperatures are lower than those recorded in the surrounding areas. Canaan's average annual temperature is 45°F. During the winter, the temperatures in Canaan Valley are consistently below 38°F average and can reach below -20°F on occasion. Summer temperatures average between 75°F and 80°F. With an average elevation of 3,200 feet above sea level and mountains that ring the valley, a frost pocket can develop where the cold moist air becomes trapped in the valley. As a result, frost can occur throughout the summer months creating a brief growing season more typical of areas farther north. Temperatures in the 20's (F) have been recorded in all summer months (Leffler 2002).

Due to the valley's location along the ridge of the Allegheny Mountains, precipitation is enhanced from orographic lifting events. Moist air is forced up over the high ridge of the Alleghenies which creates heavier precipitation within the valley than in surrounding areas. Annual precipitation in Canaan Valley averages 55 inches. Precipitation is rather evenly distributed during the year, with the driest months typically occurring in September and October. June is usually the wettest month of the year typically averaging 5.4 inches of precipitation. On average, 4.46 inches of precipitation fall each month. Out of the total precipitation, a significant portion falls as snow in Canaan Valley. Annual snowfall on the valley floor averaged 134 inches for the period of 1961-1990 (Leffler 2002).

Canaan Valley is currently the subject of an intensive climate study conducted by the National Oceanic and Atmospheric Administration (NOAA). Recent research shows that the valley is impaired by both wet and dry sulfuric and nitric acid precipitation as well as high levels of ozone pollution. Acid precipitation in the Canaan Valley during the fall and winter of 2000-2001 averaged 4.3–4.4 pH.

Hydrology

Fresh water

The main water body in the Canaan Valley is the Blackwater River. The headwaters of the Blackwater originate within the Canaan Valley Resort State Park (State Park) and flow north exiting out of the valley on the western gap between Canaan and Brown mountains. Cabin Mountain, forming the eastern watershed boundary of the Valley, also forms the drainage divide between the eastward-flowing Potomac and northwestward-flowing Cheat River.

In Canaan Valley the Blackwater River gradient is approximately 3.7 feet per mile. Its gradient between Canaan Valley and Davis is approximately 17.6 feet per mile. Annual average flow of the Blackwater River is 191 cubic feet per second (cfs).

Tributaries to the Blackwater enter along its course through the valley and many of them flow through the refuge. These tributaries include the Little Blackwater River, Glade Run, the North Branch, Sand Run, Yokum Run, and Freeland Run. Additionally, numerous unnamed small streams and springs feed the Blackwater as it travels through the valley, adding to its size. The Blackwater River and its major tributaries are low gradient streams on the refuge.

There are numerous springs and seeps throughout the refuge that create wetlands and small ponds. Extensive wetland complexes occur in the northern portion of the refuge. These wetlands comprise the largest wetland aggregation in the State of West Virginia. Beaver activity has impounded drainages on the refuge to create ponds of various sizes. Old beaver ponds have developed into palustrine wetlands and bogs. Beaver ponds have increased over the years as beaver populations swelled. Analysis of aerial photography found 113 beaver ponds in 1945 and 222 in 2003 (Bonner 2005, 2009).

There are four ground water aquifer zones in Canaan Valley identified as the Pottsville/Mauch Chunk, Greenbrier, Greenbrier/Pocono and Pocono. Wells drilled in the valley range from 105 feet in the valley floor to over 260 feet in the Pocono aquifer on the hilltops of the valley (Kozar 1995).

The importance of the North Branch was also studied by Kozar (1995) who notes the 5.5 mi^2 North Branch drainage was an important source for ground water recharge for Canaan Valley due to its large drainage area. The southern portion of the valley was found to have a more significant role in ground water recharge compared to the north end of the valley. This was mostly attributed to the permeability of the limestone geology that underlies certain drainages in the southern end of the valley (Kozar 1995).

The majority of the fresh water used is withdrawn by the State Park and Timberline Four Seasons Resort. The State Park pumped over 144 million gallons of surface water from the Blackwater River for park operations during 1992 (including operation of the ski resort and golf course). Timberline Four Seasons Resort used almost 9 million gallons of ground water and 50 million gallons of surface water for operations and snow making during 1990. With increasing development occurring in the southern portion of the valley, ground water use through new well development continues to increase.

Geology

The refuge lies in the Canaan Valley watershed located in the high plateau zone of the Allegheny Mountain section of the Appalachian Plateau physiographic province (Gwinn, 1964). The average elevation of 3,200 feet above sea level coupled with the 35,000 acre watershed makes this area the highest valley of its size east of the Rocky Mountains. The average elevation for the ridges surrounding the valley is 3,900 feet, although several peaks reach elevations in excess of 4,200 feet.

The Canaan Valley was formed by the erosion of the Blackwater Anticline. This created the center "middle ridge" portion of the valley, formed by Pocono sandstone which is the older sandstone formation in the valley. More erosive rock in the center and edges of the valley created depressions surrounding the middle Pocono sandstone ridge. These depressions are what have developed into the wetland areas of the valley. Canaan is underlain by moderately dipping sedimentary rock of the Pocono, Greenbrier, Mauch Chunk, and Pottsville Groups.

Pottsville sandstone forms the ridges surrounding the valley with the younger sandstones, shale and coal of the Mauch Chunk and Pottsville groups lying underneath. The Mauch Chunk seen in exposed sections of the valley as red, fine grained shale occupies the lower slopes of Canaan and Cabin Mountains. Greenbrier limestone underlies most of the valley creating unique wetland communities where their buffering capacity influences water quality.

Soils

The soils of the valley were characterized by the U.S. Department of Agriculture 1967 soil survey report into 19 series and five physiographic categories: uplands, lower slopes, flood plains, and stream terraces and swamps (Losche and Beverage, 1967). The upland sites are characterized as well-drained or excessively

drained. The two major soil associations are Wet Terrace Land-Dekalb-Blago Associations and the Dekalb-Calvin-Belmont Associations. The common soils making up the upper, middle, and lower portions of sloping land and low hills are Dekalb, Calvin, and Belmont. Mecksville soils are characterized as deep and well-drained and tend to occur at the bases of mountain slopes in the valley (Fortney 1975).

Soils in the lower flood plain, stream, and swamp areas are mostly poorly to very poorly drained. The most common soil types in these areas are Blago and Atkins, with Muck and Peat soils occurring most extensively in the Canaan Valley (Fortney 1975). Wet Terrace Land soils include Blago and Atkins series soils as well as other soils in undifferentiated land units. Similarly Muck and Peat soils combine all organic soil types into one category for mapping purposes.

Canaan Valley contains the largest expanse of Wet Terrace Land and Muck and Peat soils in Tucker County. These wetland soils are characterized as organic soils that are either strongly or extremely acidic. Generally these organic soil layers are two feet or more in thickness. Muck and Peat soils are generally flat with a water table at or near the surface most of the year (Fortney 1975).

Environmental Contaminants

Little information exists for environmental contaminants on refuge property. However, in May 2006, Kathleen Patnode, a Service environmental contaminants specialist, conducted a site visit as part of the scheduled Contaminants Assessment Process (CAP). The objective of the CAP is to identify any past, current, or potential contaminants issues on the refuge and to recommend, where necessary, corrective or preventative measures. She visited known or suspected areas of concern and reviewed the property acquisition files for these areas. For all but one area, previous evaluation was limited to a Phase I Contaminants Survey prior to acquisition.

Areas evaluated include a water-pumping station adjacent to the Blackwater River on the Reichle Tract, approximately ten capped natural gas well sites and eight old hunting cabins on the Main Tract, several barn sites where agricultural chemicals may have been stored, and three trash dumps on the Cortland, Reichle, and Harper Tracts. Of these, Patnode felt that only the dump on the Reichle Tract warranted further evaluation based on numerous drum carcasses, waste indicative of automotive repairs, and waste present in a tributary. The refuge plans to request funding to sample the soil, sediment, and water associated with this dump to facilitate removal of the waste. All but two of the old hunting cabins have been subsequently removed in a joint partnership between the refuge and the WVDEP Rehabilitation Environmental Action Plan (REAP) program.

A Phase II Contaminants Survey was performed in 2000 for the active gas well site on Tract 42 prior to the purchase. Diesel fuel oil, waste water (brine), hydraulic fluid, and mercury were identified as potential contaminants. Samples taken from immediately adjacent to and down gradient of the waste water storage tank had low levels of petroleum hydrocarbons and mercury. Patnode noted that an area of dead vegetation still exists between the storage tank and the wetland which may be due to salt toxicity from the brine solution. To prevent migration when the tank is emptied in the future, a berm should be installed around the tank by the well operator.

The primary contamination concern for this refuge is the potential for spills and waste associated with the current and future wells/pipelines or mines as most of the property was purchased without mineral rights. A secondary concern is the atmospheric deposition of pollutants from industries and coal-fired power plants due to the topography, elevation, acid precipitation, and high potential for mercury

methylation within the wetlands. A sample of stream salamanders analyzed for metals contained selenium concentrations of risk for water shrew. Mercury in these salamanders did not pose a risk, but methylation in streams is low compared to wetlands. NOAA mercury deposition data should be evaluated to determine if biota sampling in the wetlands is warranted.

Ken Sturm/USFWS

Lower Idleman's Run

Water Quality

The primary river draining the refuge is the Blackwater River. Seven named tributaries and numerous smaller streams exist throughout the refuge that flow into the Blackwater as it makes its way from the headwaters in the State Park to the Canaan-Brown Mountain gap where it exits the valley and the refuge. The refuge contains the headwaters area of the Little Blackwater River and Glade Run as well as most of Idleman's Run and Freeland Run. Additionally, land acquisition in 2005 and 2008 protected much of the North Branch River and Flat Run, important tributaries and circumneutral wetland corridors in the south end of the valley.

Increased development in the southern portion of the valley has heightened concerns of water quality and availability in the Blackwater River. Wastewater from recreational and other developments is typically treated with aeration plants, lagoons, or individual septic tanks. In 1998 there were three wastewater facilities that discharged directly into the Blackwater River. There were 12 additional wastewater facilities that discharged directly into tributaries of the Blackwater. Currently there are plans to create new centralized, shared wastewater treatment facilities to upgrade current systems and allow growth of developed areas.

Ground water quality was described as being primarily influenced by the mineral composition of the source rock with septic discharges and agricultural land use practices influencing it to a lesser extent (Chambers et al. 2002). Within ground water samples, commonly detected contaminants were bacteria, radon, and manganese. However, most ground water samples taken during a U.S. Geological Survey 1991 survey did not exceed U.S. Environmental Protection Agency (EPA) standards (Chambers et al. 2002).

With increasing development in the southern portion of the valley, more water will be removed from the watershed. Importantly, surface waters removed during the summer and fall low flow periods may impact aquatic resources. According to Kozar (1995) "In excess of one-third of available surface water resources is being used during low flow period" in the valley. Impacts of this use are obvious on Idleman's Run, which flows dry in late summer and early fall and also harbors a productive brook trout fishery. A water diversion removes surface water from the upper reaches of Idleman's Run to supply water to an emergency snow making pond at a development on Timberline Road. This exacerbates low water flow, increased stream temperatures, and direct loss of habitat for brook trout populations on the refuge during the fall breeding season. As development increases in the valley, water resources will likely continue to be tapped and impacted in both quantity and quality.

Water quality analysis has been conducted primarily in the main stem of the Blackwater River within Canaan Valley. Early testing (1970's) was conducted to

develop base line conditions to measure change against if the hydroelectric project was completed by Allegheny Power. Testing was also conducted to evaluate impacts to water quality by developments such as the State Park and Timberline Four Seasons Resort.

Most recently, water quality has been studied by the USGS and the West Virginia Division of Environmental Protection for the development of total maximum daily load limits. The Blackwater River was found to have dissolved oxygen limit levels below the recommended as a State minimum for a trout fishery (6.0mg/l). This problem was attributed primarily to municipal point sources in the valley; however beaver ponds and wetlands upstream from the sampling site have also been implicated in reducing dissolved oxygen levels in the Blackwater (Environmental Protection Agency 1998).

The Service and USGS conducted a study of the effects of off-road vehicle use on water quality of the Blackwater River in 1993. This particular study was designed around an off-road vehicle race which brought hundreds of participants into the Canaan Valley and lower Blackwater River drainage. Samples were collected before, during, and after the race and analyzed for dissolved oxygen, suspended sediment, fecal bacteria concentrations, pH, and turbidity. This study found increases in suspended sediment concentrations, turbidity, and fecal bacteria concentrations related to the off-road vehicle activities, particularly around camp areas, within the Blackwater River. (USFWS 1993).

According to Snyder et al. (2002) acid rain may be having an important impact on stream quality in Canaan Valley. Due to the sandstone geology in the higher elevation streams and the low pH of precipitation (3.86-4.41 in 1995-1996), it was estimated that almost half of all streams and ponds in Canaan Valley would not support brook trout (Snyder et al. 2002). According to some studies, the lower limit of brook trout embryo and hatchling survival is a pH of 4.5. Streams that occur in the lower elevations of the valley can be influenced by the Greenbrier limestone which can offset and buffer low pH waters and create suitable brook trout habitat.

Unexploded Ordnance

The presence of unexploded ordnance—left over from military training activities during World War II—on refuge property was thought possible due to the confirmed presence of ordnance in both the Dolly Sods Wilderness area to the east of the refuge and the Canaan Valley Institute property to the west of the refuge. This possibility was confirmed when a live 105mm artillery round was found by a hunter on refuge property during the spring of 2007. After consultation with the Army Corps of Engineers and a review of historic maps, it became evident that the target areas used by the military during the war included areas now part of the Canaan Valley refuge, well down slope from the ridgeline closer to the Dolly Sods Wilderness Area.

The extent of what is now the refuge that was actually used for target practice activities is unknown. The only information available is in historical maps indicating potential target areas and the actual live round found in 2007. No other ordnance has been found; however, the Army Corps of Engineers has not yet conducted a comprehensive sweep of known bombing target areas on refuge property.

The refuge currently partners with NOAA to provide a site location for an air monitoring station. The station, located on the Beall Tract of the refuge, is part of the Atmospheric Integrated Research Monitoring Network and is part of the National Atmospheric Deposition Program. The purpose of this monitoring site is

to collect data on atmospheric wet and dry deposition along with other air quality data. The station has been operational on refuge property since 2000.

Monitoring activities include ozone levels in the Canaan Valley. Overall air quality is good, with no current criteria pollutants exceedances, but of recent concern is ground level ozone which has exceeded the EPA 8-hr standard (75 ppb) for safe health levels on 1-5 days per year from 1995 to present. Ozone has been cited as not only important in protecting human health but also as a direct threat to vegetation and plant communities in the eastern United States (U.S. Environmental Protection Agency, 1996). Ozone levels were found to be in excess of the 8 hour standard (>0.08ppm) in Canaan Valley during the years 1995-1999 at a monitoring site on Bearden Knob on the southwestern side of the valley. Additionally the levels of ozone detected at this site exceeded levels considered harmful to wide ranges of vegetative communities (Edwards et al. 2004).

Regional Economic Setting

The Canaan Valley region is a unique mountain valley, with habitats, plants, and animals typically found at higher latitudes. The refuge works to preserve unique wetlands and uplands of this high elevation, moist valley (USFWS 2006b). Canaan Valley refuge is located in Tucker County, West Virginia, in the northeastern portion of the State known as the Potomac Highlands Region. In 1994, with the purchase of 86 acres, Canaan Valley refuge became the nation's 500th refuge. Currently, the refuge consists of over 16,000 acres. Over 8,932 additional acres are within its acquisition boundary. The acquisition boundary encompasses most of the wetlands and unique habitats of the valley. Acquisition will continue, dependent on willing sellers and availability of funds.

The refuge is within a few hours' drive of several large metropolitan areas including Pittsburgh and Harrisburg, Pennsylvania, Washington, D.C., Baltimore, Maryland, and Charlottesville and Richmond, Virginia (Tucker County Convention and Visitors Bureau, 2008). For the purposes of an economic impact analysis, a region (and its economy) is typically defined as all counties within a 30–60 mile radius of the impact area. Only spending that takes place within this local area is included as stimulating changes in economic activity. The size of the region influences both the amount of spending captured and the multiplier effects. While the refuge is located in Tucker County, the city of Elkins (located in adjacent Randolph County) is economically important to the refuge as well. Most of the refuge personnel live in Elkins, and approximately twenty five percent of the refuge non-salary purchases are made in Elkins. Randolph County is the largest county in West Virginia with a total area of 1,040 square miles (U.S. Census Bureau, 2008). Elkins is located in the northern tip of Randolph County, 34 miles southwest of the refuge. The refuge's economic ties to Randolph County do not extend past Elkins. Based on the relative self-containment in terms of retail trade, Tucker County and the city of Elkins were assumed to comprise the local economic region for this analysis.

Population

Table 3.1 shows the population estimates and trends for the regional area and communities near the refuge. In 2000, the city of Elkins and Tucker County were similar in terms of population size with 7,032 residents in Elkins and only a few hundred more (7,321) in Tucker County (U.S. Census Bureau, 2008). Davis, Thomas, and Parsons are the principal communities in Tucker County located near the refuge. In 2000, Tucker County was the third least populated county in the State and accounted for less than one percent of the State's total population (U.S. Census Bureau, 2008). The town of Parsons was the only community that resembled the State's 0.8 percent population growth rate, with a 0.7 percent population increase from 1990-2000 (U.S. Census Bureau, 2008). Elkins and Tucker County experienced population declines of approximately 5 percent between 1990-2000 while the smaller communities of Davis and Thomas experienced larger declines of over 21 percent (U.S. Census Bureau, 2008).

Table 3.1. Local and regional population estimates and characteristics.

	Population in 2000			Population change (%)
	Residents	Persons per square mile	Median age	1990 to 2000
West Virginia	1,808,344	75.1	38.9	+0.8
Tucker County	7,321	17.5	42.0	-5.3
communities near refuge				
Elkins (Randolph County)	7,032	2,207.7	38.8	-5.5
Davis (Tucker County)	624	546.0	41.5	-21.9
Thomas (Tucker County)	452	753.6	47.8	-21.1
Parsons (Tucker County)	1,463	1,332.5	39.9	+0.7

Source: U.S. Census Bureau (2008), Census 2000 Summary File (SF-1)

The city of Elkins is located in the heart of West Virginia's Mountain Highlands and serves as the recreation gateway community to the Monongahela National Forest with nearby access to the refuge, State parks, forests, and natural landmarks (City of Elkins, 2008). Situated on a bend in the Tygart Valley River, Elkins was founded by Senators Henry Gassaway Davis and Stephen B. Elkins in 1890 and became the Randolph county seat in 1899 (City of Elkins, 2008). Historically, the area was dominated by agriculture (West Virginia Rails-to-Trails Council, 2002). The senators were responsible for bringing the WV Central and Pittsburgh Railway into Elkins which opened the surrounding territory to development (City of Elkins, 2008). The completion of the railway in the late 1890's made extraction of the large reserves of coal, limestone, shale, and timber resources possible and encouraged industrial development of the area (West Virginia Rails-to-Trails Council, 2002).

Approximately 41 percent of Tucker County, known as the "Top of the Mountain State," is publicly owned land. Parsons, the county seat, is located on the Shaver's Fork of the Cheat River and is home to 1,463 residents. The town was incorporated in 1893 and named for Ward Parsons, a pioneer who owned the land on which the town was built (West Virginia Rails-to-Trails Council, 2002). Davis, the highest incorporated town in the State at an elevation of 3,200, consists of 624 residents. The town has a longstanding tradition with the lumber industry and was known in its early years as "Canada," due to its dense forest of spruce and hardwoods (Town of Davis, West Virginia, 2006). Thomas, home to 452 residents is only 2.5 miles from Davis. Like many towns in the region, Thomas has its roots in the coal industry. By 1892, Davis Coal and Coke was one of the largest coal plants in the world, employing 1,600 people in Thomas (Tucker County Convention and Visitors Bureau, 2006).

The Census Bureau (2008) reports that in 2000, West Virginia's population consisted of 95 percent white persons not of Hispanic or Latino origin. Tucker County (98.9 percent), and the communities of Elkins (96.9 percent), Davis (97.9 percent), Thomas (98.7 percent) and Parsons (99 percent) all had averages greater than the State average in 2000. The percentage of residents identifying themselves as Black or African American, American Indian or Native Alaskan, and Asian was 2.2 percent in Elkins and less than 0.5 percent in Tucker County (U.S. Census Bureau, 2008). Ancestry patterns across Elkins, Davis, Thomas and Parsons were similar to each other with heavy German, Irish and English influences (U.S. Census Bureau, 2008).

Approximately 71.5 percent of West Virginia residents 25 years and older are high school graduates. Tucker County (75.4 percent) and the communities of Elkins (79.5 percent), Davis (76.7 percent), Thomas (84.5 percent) and Parsons

(77.4 percent) all displayed rates greater than the State average. In 2000, the percentage of residents who held a bachelor or advanced degree was 14.8 percent for the State of West Virginia while the national average was 24.4 percent (U.S. Census Bureau, 2008). Elkins (23.4 percent) exceeded the State average while Tucker County (10.5 percent) and the communities of Davis (9.4 percent), Thomas (10.1 percent), and Parsons (11.8 percent). were all less then the State average (U.S. Census Bureau, 2008).

Employment and Income

Employment estimates (2006) for Elkins, Tucker County, and the State of West Virginia are shown in Table 3.2. Generally, Elkins and Tucker County resembled the State's percentage of employment in each industry. Two main differences were that the employment in the accommodation and food industry in Tucker County was almost 10 percent higher than the State average and Elkins employment in educational, health and social services industries was over 14 percent higher than the State average. Government employment accounted for almost 17 percent of West Virginia's total employment in 2006, a greater percentage than any other sector. Government was also the largest employer in Tucker County and the second largest employer in Elkins in 2006. In 2006, construction, manufacturing, retail trade and the finance, insurance, real estate, and information industries were other main industries providing employment in Tucker County. Other main industries providing employment in Elkins in 2006 were retail trade and the arts, entertainment, recreation, and accommodation and food services (U.S. Census, 2008).

Table 3.2. 2006 full-time and part-time employment for West Virginia, Tucker County and Elkins

	West Virginia	Tucker County	Elkins**
Total non-farm employment (jobs)	860,554	3,697	5,791
Percent of Employment by Industry			
Ag, forestry, fish & hunting	0.5%	(D)*	2.5%
Mining & Utilities	4.4%	(D)*	—**
Construction	6.6%	8.1%	5.3%
Manufacturing	7.1%	8.2%	10%
Wholesale trade	3.1%	(D)*	3%
Transportation & warehousing	3.0%	2.8%	2.7%
Retail trade	12.7%	10.4%	11%
Finance, insurance, real estate, & information	7.4%	7.6%	5.6%
Services			
Professional, management, admin., & waste	9.4%	(D)*	8.2%
Health care, social assistance, & educational	14.0%	11.1%	28.6%
Arts, entertainment, & recreation	1.9%	1.3%	—**
Accommodation & food	7.1%	17.0%	10.2%
Other services	6.2%	7.0%	4.9%
Government (Federal, State, & local)	16.8%	19.0%	17.8%

Source: State and County level data from U.S. Dept. of Commerce, Bureau of Economic Analysis, Regional Economic Information System 2008. Self-employment is not included.

(D): Data suppression. Data not shown to protect confidential information, but the estimates for these items are included in the totals*

***Elkins data from U.S. Census (2008), Arts, Entertainment & Recreation included in Accommodation and food, Mining was not reported*

U.S Census Bureau (2008) data for median household income, unemployment and percentage of persons living below poverty are shown in Table 3.3. As shown in Table 3.3, Tucker County and all the communities included in the study area were below the State and national averages for median household income. The national average unemployment rate in 2000 was 3.7 percent, and West Virginia's average unemployment rate was 4.0 percent in the same year. Thomas (3.6 percent) was the only community in the study area with an unemployment rate lower than the State and national averages. The percent of population below the Federal poverty line is an indicator of the economic distress within a community. In 1999, the national average of individuals living in poverty was 12.4 percent. West Virginia's average was 17.9 percent. Tucker County (18.1 percent) exceeded both the State and national averages. Elkins (14.4 percent), Davis (14.6 percent) and Thomas (13.7 percent) were greater than the national average, but less than the county and State averages. Parsons (18.7 percent) has the greatest percentage of its residents living below the poverty line of the towns in the study area (U.S. Census Bureau, 2008) (Table 3.3).

Table 3.3. Income, unemployment and poverty estimates

	Median Household Income (1999)	Percent Unemployed (2000)	Percent of Persons below Poverty (1999)
United States Average	$41,994	3.7	12.4
West Virginia	$29,696	4.0	17.9
Tucker County	$26,250	4.2	18.1
Elkins (Randolph County)	$26,906	4.7	14.4
Davis (Tucker County)	$25,221	5.2	14.6
Thomas (Tucker County)	$22,443	3.6	13.7
Parsons (Tucker County)	$26,424	4.3	18.7

Source: U.S. Census Bureau (2008)

Recreation and Tourism

The travel and tourism industry continues to be a significant and growing contributor to the West Virginia economy. According to a recent report on the economic impact of travel on West Virginia, travel-generated spending totaled over $3.97 billion, supporting 44,000 jobs with $854 million in earnings (Dean Runyan Associates, 2007). According to the report, travel spending in West Virginia increased by 8.8 percent per year from 2000 to 2006. In 2006, travel-generated earnings accounted for 12.4 percent of total earnings in Tucker County and 1.6 percent of total earnings in Randolph County while travel generated employment accounted for 19.1 percent of total employment in Tucker County and 3.4 percent of total employment in Randolph County (Dean Runyan Associates, 2007).

With many acres of public land, including the refuge, the Monongahela National Forest, and Blackwater Falls and Canaan Valley State parks, Tucker County and the greater Canaan Valley offer numerous outdoor recreation activities. Popular activities include hunting, camping, mountain biking, fishing, whitewater rafting, and canoeing. Winter recreation activities are another major attraction in Tucker County with Canaan Valley Resort State Park and Timberline Resort for downhill skiing, and White Grass Touring Center (White Grass) for cross-country skiing and snowshoeing. On average, the resorts receive between 150 and 200 inches of snowfall each year. (Tucker County Convention and Visitors Bureau, 2008).

USFWS

Visitor center

Details about the economic contributions associated with wildlife viewing, fishing, and hunting in West Virginia are provided below.

Wildlife Viewing
Abundant opportunities are available throughout West Virginia for formal wildlife education or recreational viewing. Wildlife viewing can include the activities of observing, identifying, and photographing. The 2006 National Survey of Fishing, Hunting, and Wildlife Associated Recreation (FHWAR) asks respondents about wildlife viewing around their homes and trips taken for the primary purpose of wildlife watching (USDOI et al. .2008). In 2006, there were a total of 743,000 wildlife watching participants (residents and nonresidents) in West Virginia with over 4 million days of participation away from home. Spending associated with wildlife watching in West Virginia totaled $241.6 million in 2006; of which 56 percent ($136.1 million) were trip-related expenditures and 44 percent ($105.5 million) were spent on equipment and other expenses (USDOI et al. 2007).

According to a Service report, on the national and State economic impacts of wildlife watching (USDOI et al. 2003), accounting for the multiplier effect, spending by resident and nonresident wildlife watchers in West Virginia in 2001 generated $252.5 million in output, $74.7 million in wages, 3,946 jobs, and $6.4 million in State sales tax revenue. This accounted for 0.5 percent of total employment and 0.4 percent of employment income in West Virginia (USDOI et al. 2003).

Hunting
The FHWAR indicates that hunting participation in the U.S. declined from 14.1 million in 1991 to 13 million in 2005 (USFWS 2007d). Data from the 1991, 1996, 2001, and 2006 FHWAR indicate that the declines were attributable to declines in both recruitment of new participants and retention of former participants. According to Curtis Taylor, chief of the Wildlife Resources Section of the West Virginia Division of Natural Resources (WVDNR), hunting numbers in West Virginia have stayed fairly consistent and are not following the declining national trend (Darst, 2008). Hunting on the refuge has stayed consistent as well with an average of 1,837 hunting permits issued annually.

In 2006, there were a total of 269,000 resident and non resident hunters in West Virginia. Residents of West Virginia accounted for 72 percent of total hunters and 86 percent of the 3.9 million days of hunting in West Virginia (USDOI et al. 2007).

According to USDOI and others (2007), hunting-related expenditures by State residents and nonresidents in West Virginia totaled $284.5 million in 2006; of which 28 percent ($79.4 million) were trip-related expenditures and 72 percent ($205.1 million) were spent on equipment and other hunting-related expenses (i.e., membership dues, licenses, permits and land leasing). According to a report by Southwick Associates (2007) accounting for the multiplier effect, spending by resident and nonresident hunters in West Virginia generated; $453.5 million in output, $133.2 million in income, 6,337 jobs, and $29.6 million in State and local sales taxes in 2006.

Fishing

The FHWAR indicates that fishing participation in the U.S. declined from 35.6 million in 1991 to 34.1 million in 2005 (USDOI et al. 2007). Similar to hunting, the FHWAR data indicate that the declines were attributable to declines in both recruitment of new participants and retention of former participants.

In 2006, more than 376,000 people in West Virginia participated in freshwater fishing. West Virginia residents accounted for 77 percent of total freshwater anglers and 94 percent of the 6.9 million days of freshwater fishing in West Virginia (USDOI et al. 2007). Direct spending in West Virginia by State resident and nonresident freshwater anglers totaled $334 million in 2006; of which 46 percent ($154 million) were trip-related expenditures and 54 percent ($180 million) were spent on equipment and other expenses (USDOI et al. 2007). According to a report by Southwick Associates (2007b) accounting for the multiplier effect, spending by resident and nonresident anglers in West Virginia generated $485.3 million in output, $137.9 million in income, 6,617 jobs, and $29.2 million in State and local sales taxes in 2006.

The Refuge and its Resources

This section presents an overview of land uses within the study area and emphasizes land use patterns of the watershed within the existing refuge acquisition boundary.

Land Acquisition History

Canaan Valley National Wildlife Refuge was first designated administratively by the Service in a decision document released on May 30, 1979. However, the Service decided to await the outcome of litigation surrounding a proposed storage hydroelectric facility before establishing the new refuge. The refuge was established on August 11, 1994 upon Service acquisition of the first tract of land. The refuge now consists of 16,193 acres. The Service has acquired lands for the Canaan Valley refuge under the following authorities:

1) Fish and Wildlife Act of 1956 [16 U.S.C. 742f(a)(4)]

2) Emergency Wetlands Resources Act of 1986 [16 U.S.C. 3901b]

3) Migratory Bird Conservation Act of 1926 [16 U.S.C. 715d]

Table 3.4 gives the land acquisition history of the refuge. See map 3-1 for the existing status of lands within the refuge's acquisition boundary.

We anticipate that the Service will continue to acquire lands within the approved acquisition boundary under the same authorities that have been used to acquire lands in the past. Based on refuge purposes, lands could also be acquired under several other legislative authorities, including but not limited to:

- Endangered Species Act [16 U.S.C. 1534]
- National Wildlife Refuge Administration Act [16 U.S.C. 668dd(b)]

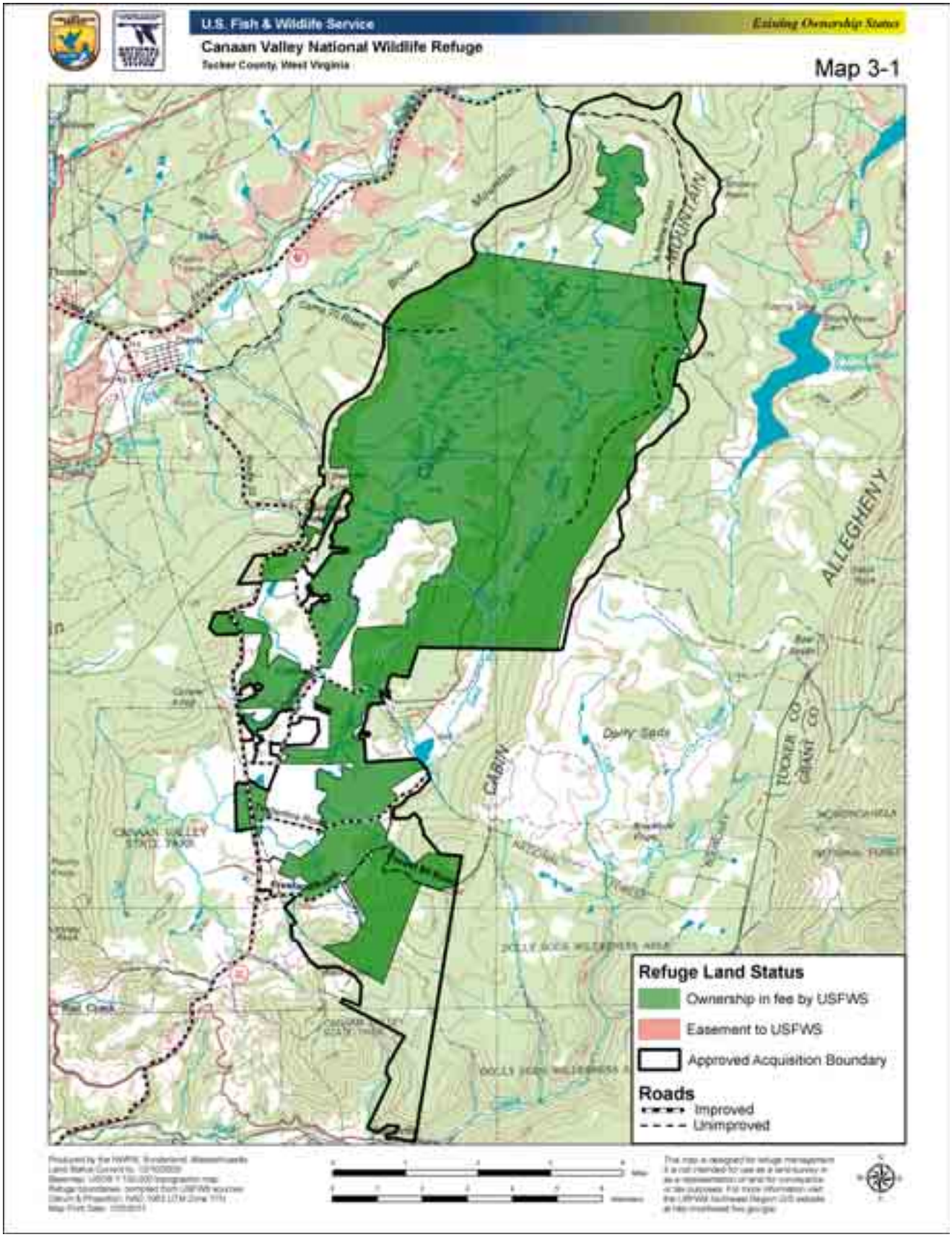

U.S. Fish & Wildlife Service
Existing Ownership Status
Canaan Valley National Wildlife Refuge
Tucker County, West Virginia
Map 3-1
Refuge Land Status
Ownership in fee by USFWS
Easement to USFWS
Approved Acquisition Boundary
Roads
Improved
Unimproved

Table 3.4. Land acquisition history for Canaan Valley refuge.

Calendar Year	Total Acreage	Location	Funding Source
1994	141.39	Tucker County	LWCF
1995	585.37	Tucker County	LWCF
1996	38.92	Tucker County	LWCF/Other
1997	59.66	Tucker County	LWCF
1998	922.28	Tucker County	LWCF
1999	1,501.46	Tucker County	LWCF
2000	43.35	Tucker County	LWCF
2001	10.37	Tucker County	LWCF
2002	11,961.43	Tucker & Grant County	LWCF
2004	560.90	Tucker County	LWCF/MBCF
2005	1.10	Tucker County	LWCF
2006	106.68	Tucker County	LWCF/MBCF/Other
2008	120.10	Tucker County	LWCF
2009	140.75	Tucker County	LWCF
Total	**16,193.76**		

Staffing and Budget

The current staff (2010) consists of eight permanent employees: a refuge manager, a deputy refuge manager, two wildlife biologists, two park rangers for Visitor Services, a park ranger for Law Enforcement, and an engineering equipment operator. In addition, there is a term position for an office assistant. Permanent staff, operations, and maintenance budgets over the last five years are included in Table 3.5. Operations funding includes those funds used for salaries, contracts, field projects, supplies, fuel, and utilities. Operations funding is split into account 1261 (wildlife and habitat management), 1263 (visitor services), and 1264 (refuge law enforcement) fund sources. Maintenance funding (1262) is used for maintaining the existing infrastructure, Youth Conservation Corps (YCC), and equipment replacement.

Significant maintenance projects completed over the last several years have included construction of a new maintenance building, headquarters parking area renovation, and repairs on Forest Road 80 and A-Frame Road. Additional funding was appropriated for construction of a residence building which was completed in 2006, new exhibits for the Visitor Center completed in 2006, and a native plant garden complete in 2007. The following costs have been incurred over the past four years.

Refuge Residence Building:	$250,000
Maintenance Building:	$742,600
Forest Road 80 and Headquarters parking area:	$118,000
A-Frame Road:	$360,000
Visitor Center exhibits:	$396,000

Table 3.5. Refuge budgets from 2002 to 2008

Year	Permanent Staff	1261 Funds	1262 Funds
2002	6	615,400	50,000
2003	6	729,425	92,250
2004	7	691,698	50,000
2005	8	751,169	68,600
2006*	7	756,390	90,455**
2007*	7	747,122	82,214**
2008*	7	831,713	76,150**

** The 1261 figure depicted here is the total of all 1260 (1261, 1262, 1263, and 1264) funding less 1262 maintenance, YCC, and vehicle replacement.*

*** Includes YCC and vehicle replacement.*

USFWS

Canaan Valley National Wildlife Refuge Friends group

Partnerships

Partnerships are vital to our success in managing all aspects of the refuge, from conserving land, to managing habitats and protecting species, to outreach and education, and providing wildlife-dependent recreation. The West Virginia Division of Natural Resrouces (WVDNR), the Natural Resources Conservation Service, the U.S. Forest Service (USFS), Canaan Valley Institute, West Virginia

University, Davis & Elkins College, West Virginia Highlands Conservancy, the West Virginia chapter of the Sierra Club, Trout Unlimited, The Conservation Fund, and The Nature Conservancy have been particularly important and valued partners.

Refuge Revenue Sharing Payments

The refuge contributes directly to the economy of Tucker County through annual revenue sharing payments. Since 1935, the Service has made Refuge Revenue Sharing payments to counties or towns containing lands under its administration. The Revenue Sharing Act (16 U.S.C. 715s) requires that the revenue sharing payments to counties for our purchased land will be based on the greatest of: (a) 3/4 of 1 percent of the market value; (b) 25 percent of the net receipts; or (c) 75 cents per acre. Land value for this calculation is re-assessed every five years. Since this refuge does not charge for entrance or services we have no net receipts. The exact amount of the annual payment depends on Congressional appropriations, which in recent years have tended to be less than the amount to fully fund the authorized level of payments. All of the alternatives will continue those payments in accordance with the law, commensurate with changes in the appraised market value of refuge lands, and new appropriation levels dictated by Congress.

Table 3.6 shows payments to Tucker County over the last eight years. The decrease in revenue sharing payments over the past several years is due to a decrease in national funding that is available for revenue sharing payments.

Table 3.6. Refuge revenue sharing payments for 2001 through 2007

Fiscal Year Paid	Acres	Value	Payment	Percent Payment
1994	Refuge Established			77.9
1995	86	$180,000	$1,041	77.1
1996	708	$3,390,000	$14,321	65.7
1997	747	$4,198,300	$22,816	72.5
1998	807	$4,974,300	$24,679	66.2
1999	1,553	$8,050,300	$37,588	62.2
2000	2,772	$13,146,800	$57,452	57.9
2001	3,281	$12,085,150	$46,086	50.9
2002	3,274	$12,085,150	$47,040	48.5
2003	15,235	$28,085,150	$102,122	46.6
2004	15,235	$28,085,150	$86,816	41.2
2005	15,796	$24,418,919	$85,247	46.5
2006	15,813	$24,608,919	$79,513	43.3
2007	15,834	$25,011,169	$78,143	41

Special Status Land

National Natural Landmark Designation
The Canaan Valley was designated as a National Natural Landmark (NNL) in 1974; twenty years prior to the establishment of the refuge. This designation established the northern 8 miles of the valley, approximately 15,400 acres, as a nationally significant natural area. Revision since the establishment of the landmark now includes a total of 24,763 acres of which 16,054 are refuge lands. The area contains a diverse assemblage of relict northern boreal communities and wetlands seldom found in the eastern United States. The valley is unique at this latitude with respect to size, elevation, and diversity. Canaan Valley contains approximately 8,400 acres of wetlands, which is the largest area of wetlands in West Virginia. The landmark status holds no legal obligations; however, the Service has a resource management responsibility for high quality habitat types, as recognized in the NNL program. As such, all alternatives will uphold the founding purposes for the establishment of the NNL and the refuge will work with the National Park Service (Park Service) to further the purposes of the NNL in keeping with the purposes of the refuge and the mission of the Service.

National Wild and Scenic River Designation
The Blackwater River is being studied as a potential river to be included as a National Wild and Scenic River (NWSR). The Blackwater River was studied under the National River Inventory through the Park Service and was determined to possess qualities that would make it suitable for designation. Particularly the scenic, fisheries and recreational qualities were found to be suitable for this designation. Designation of the river will be determined by the Park Service upon review of the river to ensure it meets all necessary criteria.

Vegetation and Habitat Resources

Upland Early Successional Habitat

Canaan Valley is a large, high elevation wetland surrounded by forested upland slopes that is well known for its unique assemblage of plants and habitats. See map 3-2 for existing refuge habitat types. The valley, which contains the headwaters of the Blackwater River, and extensive peatlands and shrub swamps, represents the diversity and abundance of State and regionally rare plants and plant communities found in surrounding smaller wetlands of the Allegheny Plateau highlands. Information is presented below on the important habitats and plant species (including exotic and invasive species) present on the refuge. This section ends with a discussion of regional trends for important habitats.

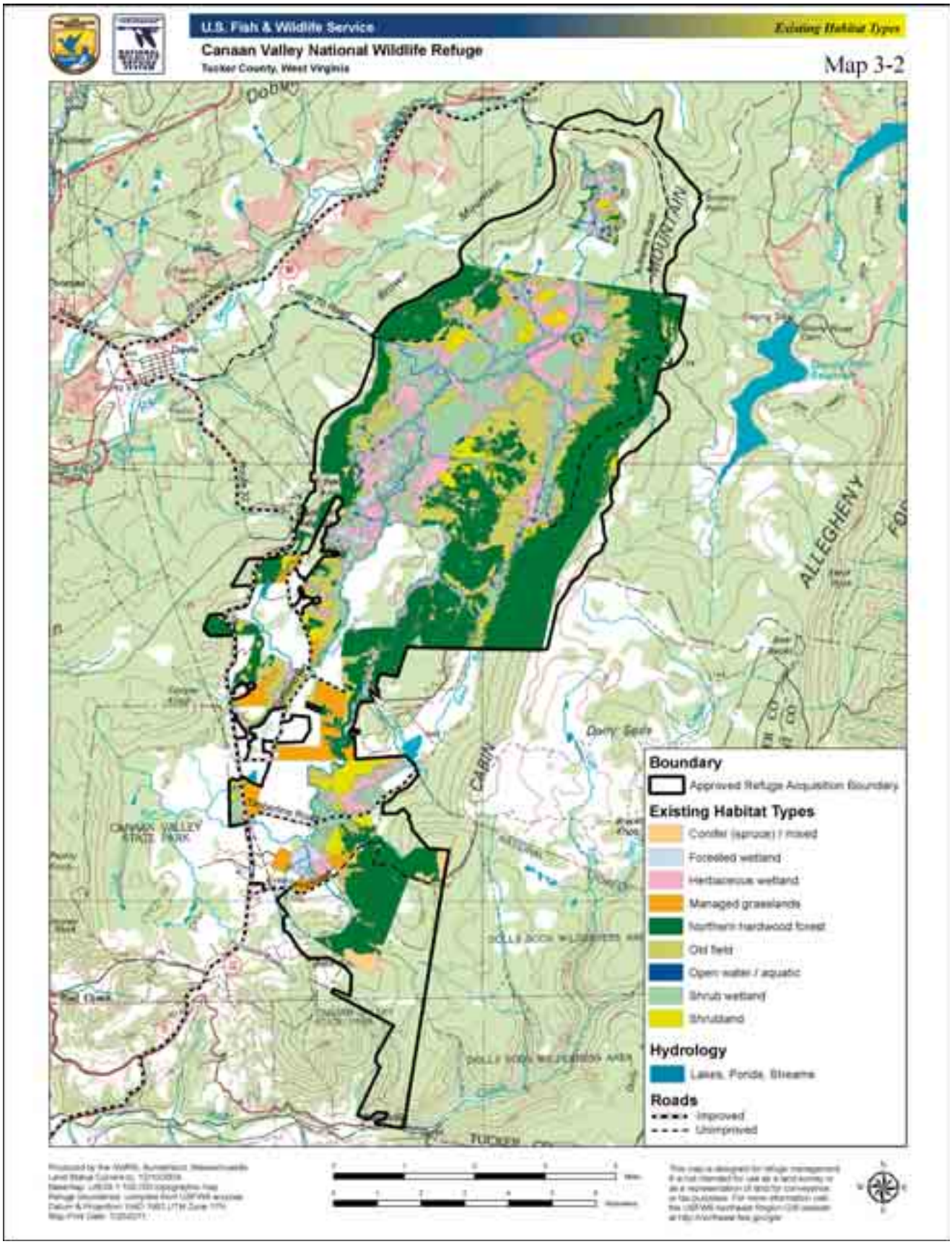
Habitats and Vegetation Communities

The early explorers to Canaan Valley colorfully reported entering a tangled mass of impenetrable spruce forest and rhododendron swamp. Historical descriptions of the area included statements of extensive laurel thickets, large dead trees covered in moss, and dense conifer forests. Other visitors more quantitatively wrote of an area which included Canaan Valley, "that nowhere else in the United States are now existing denser forests than those of black [red] spruce in the belt of country 100 miles in length and from 10 to 20 in breadth" (Rives 1898). Red spruce, eastern hemlock, and yellow birch were the principal canopy species, and rhododendron grew in dense "brakes of great extent." Mosses, lycopodiums, and occasionally wood sorrel and trilliums formed a sparse ground cover. Open glades, presumably of grasses, sedges, and forbs, followed the serpentine stream corridors on the valley's floor.

Ken Sturm/USFWS

Jacob's ladder

Severe ecological disturbances to the area's forests occurred in the late 1800s and early 1900s. Logging began in the Canaan Valley area around 1885, and continued until the 1920s (Carvell 2002). Following this clearcutting, lands in the valley were exposed to human-induced wildfires, some accidental, others


U.S. Fish & Wildlife Service
Existing Habitat Types
Canaan Valley National Wildlife Refuge
Tucker County, West Virginia
Map 3-2
Boundary
Approved Refuge Acquisition Boundary
Existing Habitat Types
Conifer (spruce) / mixed
Forested wetland
Herbaceous wetland
Managed grasslands
Northern hardwood forest
Old field
Open water / aquatic
Shrub wetland
Shrubland
Hydrology
Lakes, Ponds, Streams
Roads
Improved
Unimproved

for the purposes of clearing the land of slash and facilitating hunting and agriculture. These unregulated, uncontrolled, and unmanaged fires burned off topsoil and obliterated underlying seed sources, thus drastically altering the plant communities in the valley for decades to come. Erosion also removed the accumulated soils, therefore slowing the revegetation of the slopes and wetlands. Settlers converted the former forest land to pasture. In the mid-1900s, farmers converted some pasture to crops. Each of these land uses is represented within the refuge, and current community types reflect their history.

Canaan Valley lies within the Allegheny Mountain section of the Central Appalachian broadleaf forest-coniferous forest-meadow province (Bailey et al. 1994). Habitats on the refuge include freshwater wetland (34 percent, 5,407 acres), open water and riverine (1 percent, 166 acres), and upland (65 percent, 10,481 acres). We grouped all the habitats on the refuge into three broad habitat types: wetlands, upland early successional habitat, and upland forest. Within some of these broader habitats types we have tiered out finer habitat types. Under wetlands, we have shrub wetlands, herbaceous wetlands, and open water. Under early successional habitats we have shrubland, old field, and managed grasslands. Under upland forest we have northern hardwood forest and conifer (spruce)/ mixed forest. See Table 3.7 of the broad habitat types and their associated finer habitat types.

Table 3.7. Habitat types within the current refuge acquisition boundary.

Habitat Type	NVCS[1] Association	Acres owned by the refuge*	Acres not owned by the refuge
Freshwater Wetlands			
Forested Wetlands (conifer, deciduous)	Balsam fir–black ash swamp Balsam fir–oatgrass swamp Balsam fir–winterberry swamp Red spruce–yellow birch–mannagrass swamp Red spruce–hemlock–rhododendron swamp Quaking aspen swamp	412	102
Shrub Wetland (shrub swamp /mixed, speckled alder, spirea)	Blueberry–bracken fern shrub swamp Bushy St. John's-wort shrub swamp Chokeberry–wild raisin shrub peatland Meadowsweet shrub swamp Silky willow shrub swamp Speckled alder shrub swamp Speckled alder–arrowwood shrub swamp Steeplebush shrub swamp	3,187	658
Herbaceous Wetland (peatland, wet meadow, sedge meadow)	Cottongrass fen Silvery sedge fen Threeway sedge fen Nodding sedge fen–prickly bog sedge seep Star sedge fen Lake sedge fen Beaked sedge fen American bur-reed marsh Bluejoint grass wet meadow Woolgrass wet meadow Tussock sedge wet meadow Rice cutgrass marsh Softstem bulrush marsh Goldenrod wet meadow	1,905	288
Open Water/Aquatic (ponds, streams, river, other impoundments)	Water	166	43

Habitat Type	NVCS[1] Association	Acres owned by the refuge*	Acres not owned by the refuge
Upland Early Successional			
Shrubland (upland mixed shrub)	Meadowsweet shrubland* Bushy St. John's-wort shrubland* Spirea	859	470
Old field (upland old field/ meadow)	Goldenrod-sheep fescue/oat grass–bracken fern* Successional old field meadow* Hawthorn savannahs*	2,536	1,350
Managed Grasslands		512	6
Upland Forest			
Northern Hardwood Forest (Upland deciduous)	Central Appalachian northern hardwood forest Central Appalachian hemlock–northern hardwood forest Yellow birch / eastern rough sedge–marsh blue violet / wavy-leaf moss sloping forested seep Rough sedge seep Black cherry toe slope forest and woodland*	6,403	5,401
Conifer (spruce) / Mixed Forest (Upland conifer/mix)	Red spruce–yellow birch / mountain holly / bazzania / hypnum forest Red spruce–yellow birch–black cherry forest Red spruce / mountain laurel–menziesia rocky woodland	214	430
TOTAL		**16,194**	**8,748**

*NVCS*1-*National Vegetation Classification System*
**Provisional community names for types without NVCS matches.*

Freshwater Wetland Habitat

The wetland complex in the Canaan Valley represents the most significant wetland area in the State. An estimated 8,475 acres of wetland occur in the valley, of which the refuge currently protects 5,573 acres or 66 percent of all wetland habitats, including water, herbaceous, and woody wetlands, within the Canaan Valley watershed. According to previous work by the WVDNR, the wetlands of Canaan Valley represent almost 30 percent of the total wetland acreage in the State (Evans et al. 1982). The majority of the refuge wetlands occur in the Main Tract and Big Cove, draining the Little Blackwater River, Glade Run, Sand Run, and the Blackwater River. In the southern end of the refuge, the Herz, Cortland, Orders, Freeland, Cooper, and Reichle Tracts support wetland communities.

The wetland communities in Canaan Valley are diverse. A mosaic of shrub swamps, peatlands, and wet meadows provide habitat to a variety of passerines, shorebirds, waterfowl, amphibians, reptiles, and mammals, including alder flycatcher, northern harrier, swamp sparrow, southern bog lemming, Indiana bat, black ducks, American woodcock, snipe, American bittern, and Virginia rail. Recent dragonfly surveys have documented several rare species in West Virginia including the delta-spotted spiketail, comet darner, Hudsonian whiteface, skitailed emerald, and whiteface meadowhawk.

Similar to the upland habitats, the wetlands of Canaan Valley are reported to have been dominated by spruce forests prior to the late 1880s. Remnant stumps and roots visible in the peatlands and others uncovered in a soil study support these accounts. Rives (1898) reports open glades, presumably of grasses and forbs, in the valley bordering streams and rivers. Beaver activity may have kept glades open and successional habitat available.

Accompanying the logging activity was the building of railroad and road grades crossing the valley floor. These grades were elevated above the wetland by piling rock and debris into the wetland, creating impoundments and altering the hydrology of the valley. Many of these grades are still acting as impediments to water flow, and plant communities can vary significantly from one side of the impoundment to the other.

Prior to refuge acquisition of the Main Tract, use of the wetlands was open to the public and largely unregulated. A yearly event during the 1980s, the Blackwater 100 attracted thousands of spectators and all-terrain vehicles, motocross, "mud-buggy", and "bog-truck" riders for races and events in the wetlands. These activities removed vegetation, peat accumulation, and soil in the high-use areas. Vegetation is regrowing in some areas; other locations remain eroded and unvegetated. Some of the tracks or pathways have become channelized and act as barriers to surface water flow.

Beaver are active in Canaan Valley. Abandoned ponds succeed to vegetated habitat, and woodlands and shrublands in the wetlands near active ponds are used for foraging. This cycle of succession continuously, albeit slowly, alters wetland habitats in the valley.

The bottomland communities are shrub wetlands, herbaceous wetlands, and forested wetlands. The shrub wetland communities (alder, spirea, and other species) in the valley have been reported to be the fourth largest in the eastern United States, exceeded only by sites in Kentucky, Vermont, and Maine (Vogelmann 1978).

Shrub Wetland

Shrub wetland communities in Canaan Valley primarily include speckled alder swamps, spirea thickets, and mixed shrub swamps. Speckled alder is one of the dominant shrubs in Canaan Valley, covering approximately 14 percent of the refuge wetlands. Alder is valued for the habitat it provides to American woodcock and other species using early successional habitat. Alders in mature stands reach 3-4 meters in height, and approach 10 cm in diameter. The understory and ground cover of the alder stands appears to depend upon the hydrologic regime and soil and water acidity. In the circumneutral alder stands, a diversity of herbaceous plants can be found, including manna-grasses, arrowleaf tearthumb, and Jacob's ladder, a State species of concern. Accompanying the alder in the canopy are red spruce, yellow birch, balsam fir, and black ash. Balsam fir and black ash are considered rare in West Virginia. Nutrient-poor stands of alder may contain wild raisin, winterberry holly, and elderberry in the shrub layer. Sedges, bog goldenrod, sphagnum and haircap mosses occur as ground cover. Although abundant in Canaan Valley, the occurrence of rare species in these shrublands and the wetland character of the shrublands, classifies these habitats as rare (Fortney et al. 2005).

Typical alder swamps in Canaan are seasonally to semi-permanently inundated, holding standing water for most of the growing season. The stands border the major streams of the valley, including Glade Run, the Little Blackwater, the North Branch of the Blackwater, and the headwaters of the main stem of the Blackwater River.

In the 1970s, WVDNR biologists experimentally planted a stand of alder, in an area known as the potato field. Seed for the planting was collected from Canaan Valley and grown at a nursery in Parsons, Tucker County (Walt Lesser, personal communication). More recently, refuge staff experimented with cutting a ¾ acre patch of alder to observe the root sprouting potential for regenerating alder stands. Staff also collected alder seed from the refuge. The U.S. Department

of Agriculture's Plant Materials Center in Alderson is growing the seed, which refuge staff has begun to transplant onto the refuge to increase the succession rate of wet meadows into shrubland habitat more suitable for priority migratory bird species.

Meadowsweet spirea forms dense thickets covering over 452 acres of the refuge. Steeplebush spirea forms a rarer plant community type, of a few acres. These thickets are more frequent in the southern and western wetlands in the valley. Spirea may form pure stands or mix with willow and alder. Often impenetrable and growing to two meters, spirea stands have very little vegetation in the understory. Fortney suggests that the spirea stands have developed on poorly drained abandoned meadows, quadrupling in area since 1945 (Fortney 1997).

The largest wetland plant community is shrub swamp of a diversity of species, comprising nearly 1,943 acres, or 35 percent of the total wetland acreage of the refuge. The species of these shrublands are Glade St. Johnswort, chokeberry, wild raisin (a viburnum), arrowwood viburnum, blueberry and huckleberry, mountain laurel, and willow. The wetland surrounding the confluence of the Little Blackwater and the Blackwater Rivers is predominately mixed shrub swamp.

The wetland communities, chokeberry and blueberry, are considered a rare habitat type in the Allegheny Mountain ecoregion (Fortney et al. 2005). These communities may be mixed with the viburnums, and typically occur over peatlands or, in less saturated conditions, over dewberry and haircap moss. Glade St. John's wort is a low shrub that grows along streams and in adjacent poorly drained to saturated low fields. It may be found mixing with velvet-leaf blueberry, and with forbs such as bog goldenrod, grass-leaved goldenrod, and sedges. Willows typically grow in more nutrient-rich, saturated soils near flowing streams and seeps.

Herbaceous Wetland

Herbaceous wetland habitats in Canaan Valley include both peatlands and wet meadows and comprise 1,883 acres on the refuge. Peatlands are acidic fens receiving drainage and nutrients from surrounding mineral soils. Two general types of peatlands are recognized: those dominated by sphagnum and those dominated by haircap moss. Forbs (bog goldenrod, yellow bartonia), grasses and sedges (cottongrass, white beakrush), and dwarf shrubs (cranberries, creeping snowberry, blueberry, chokeberry) may also occur. The accumulation of mosses creates small mounds in a hummock and hollow micro-topography. The deep organic soils of the peatlands are seasonally to semi-permanently inundated. As a wetland community rarely occurring in the ecoregion outside of Canaan Valley, Fortney et al. (2005) classify peatlands as rare habitats.

The refuge supports 566 acres of peatland, 10 percent of the total refuge wetlands. The largest contiguous peatlands occur in the north-central wetland on the Main Tract between Glade Run and the Little Blackwater River, and adjacent to the west side of Middle Ridge north of the Blackwater River.

Wet meadows are low-level expanses of sedges, grasses, rushes, or forbs that are seasonally inundated. On the refuge, over 1,317 acres are characterized as wet meadow, making it the second most dominant wetland habitat type after shrub wetlands. Wet meadows are classified by their dominant species. Sedge, rush, and bulrush are the most common dominants. Several species are common in these communities: common rush, bluejoint grass, manna-grass, rice cutgrass, *Scirpus atrocintus, S. macrocarpon, S. atrovirens, Carex folliculata, C. stricta, C. scoparia, C. lurida,* and *C. vulpinoides*. Cattails, and a variety of other sedges, bulrushes, and rushes also occur. Common forbs are bog goldenrod, marsh St. John's wort, bugleweed, narrow-leaf gentian, and dewberry.

Wet meadows are interspersed between other community types, creating a mosaic of types. They most frequently border streams and drainages and are transition communities between the uplands and shrub wetlands. One of the largest contiguous wet meadows on the refuge can be found on the Herz Tract.

Bluejoint grass forms dense colonies, often excluding other species. These wet meadow community types are considered rare by Fortney et al. (2005) because of the rarity of wetlands in the Allegheny Mountain Section ecoregion and because several of the species occurring in the wet meadows are West Virginia species of special concern.

Forested Wetland

Forested wetland communities include deciduous and coniferous wetland forests, as well as a small amount of planted pine plantation. Together these communities make up 347 acres of refuge habitats. Deciduous wetland forests are of two types. Quaking aspen groves are found in the Bearden Flats and Glade Run wetland complexes, and mixed hardwood communities are found on riverside terraces of the Blackwater River and Sand Run. These hardwood forests are typically dominated by black cherry, yellow birch, and red maple. Hemlock, red spruce, and alder occasionally accompany this mix of species. In many ways this habitat resembles the upland deciduous forest—black cherry groves in overstory composition. The shrub layer and ground cover however, are typically more diverse and reflect the poorly drained to seasonally saturated soils.

Quaking aspen groves are colonies of even-aged, often mature, aspen, and are considered rare by Fortney et al. (2005). Spirea, manna-grasses, and goldenrods are typically found in the understory. Regeneration of these groves is not naturally occurring. Natural regeneration of aspen does seem to be occurring in the northeastern wetlands of Big Cove. Refuge staff is actively managing aspen stands to stimulate sapling growth to provide early successional habitat.

Compared to the reports from the late 1800s of the extensive red spruce forests throughout the valley, a small portion of the wetland is currently forested with red spruce, eastern hemlock, or balsam fir. Today 2 percent, or 132 acres, of the refuge wetlands are coniferous forest, and Fortney et al. (2005) list these habitat types as rare because of their current paucity within the Allegheny Mountain Section or because they contain rare plant species. These forests occur on low-lying sections of Freeland and Cooper Tracts, and along the major riparian corridors such as the Blackwater River through Middle Ridge.

Red spruce, balsam fir, and eastern hemlock are the dominant species in this forest type. Red maple, black ash, serviceberry, black cherry, yellow birch and mountain ash are co-dominants. During the past ten years, the population of balsam fir has declined due to an infestation of the balsam woolly adelgid. Additional mortality is caused when beaver flood low-lying stands of fir. The most extensive stand of balsam fir, on Freeland Tract, is less than half of its size ten years ago. Deer browsing eliminates many of the naturally regenerating balsam seedlings. In an effort to perpetuate balsam fir on the refuge, staff and volunteers plant balsam seedlings grown from Canaan Valley stock. Deer exclosures protect the seedlings from browsing.

Red pine-planted forests occur in two locations in Canaan Valley refuge. The first location is on the Main Tract adjacent to the Blackwater River upstream from the mouth of the Little Blackwater River. The second plantation is on Herz Tract adjacent to the Blackwater River downstream from the Old Timberline bridge crossing. The history of these plantings is unknown, and they do not appear in aerial photographs from 1968, indicating they are less than 40 years old.

Open Water/Aquatic Habitats

Two types of open water habitats occur in Canaan Valley. Riverine habitat totals approximately 72 acres and beaver ponds and other open water currently total 93 acres. Fluctuations of beaver pond habitat are natural and directly related to the abundance of beaver and available habitat on the refuge. The Blackwater River and its tributaries are often deep-channeled, serpentine, meandering streams of the valley floor. Impoundments are either natural (beaver ponds) or manmade (settling ponds). On the land currently managed by the refuge, the impoundments are active and abandoned beaver ponds. The acreage of beaver ponds fluctuates almost yearly with changes in beaver activity. Snapping turtles, mink, river otters, muskrat, and a variety of ducks, fish, marsh birds, and other mammals use these open water habitats.

The Blackwater River in Canaan Valley remains free-flowing. Sedimentation from logging and construction in the valley, unmaintained sewage treatment systems, and atmospheric pollution are the major sources of degradation to the water quality. The river is stocked with non-native brown and rainbow trout. Native brook trout spawn in several streams flowing into the Blackwater River.

Marquette Crockett/USFWS

Boardwalk, Canaan Valley National Wildlife Refuge

Most of the river channels in Canaan Valley are low gradient meanders through the valley's wetlands. In these areas the rivers and streams cut deep, soft bottom channels. In the low-lying areas, streams are buffered by wetland habitats such as wet meadows, alder and other shrub thickets, and forested wetlands. The river's main stem takes on another character as it divides Middle Ridge, widening and flowing over a rocky shallow bottom. Steeply sloped upland mixed and deciduous forests border the river in this stretch.

A multitude of active, abandoned, and relict beaver ponds provide open water and emergent habitat. Some beaver ponds visible on 1945 aerial photos are now wet meadows or shrub thickets while others still retain water. Because of these varying stages of activity and abandonment, the ponds provide a diversity of habitat, from shallow to deep, from still water to flowing, and a shifting set of plant communities adapted to these conditions.

As the beavers exploit woody vegetation for forage and construction, rare or important plant populations may be threatened. The refuge provides a limited number of special use permits to trap beaver in designated areas to prevent loss of important habitat types. Other communities, such as the rare Sparganium chlorocarpum marsh, are early successional in old beaver ponds and depend upon the beaver activity followed by abandonment to occur.

Upland habitat consists of lands not inundated by water except during catastrophic events. Upland habitats in Canaan Valley refuge include the early successional and upland forest habitats in Table 3.7: northern hardwood forest, conifer (spruce)/mixed forest, managed grasslands, old field, and shrubland. The

upland areas of the refuge border the wetlands to the west and east, and occur on a low sandstone ridge extending into the center of the valley from the south. The forests provide nesting habitat for forest-interior songbirds, more general forest songbirds (including brown creeper, black-billed cuckoo, veery, hermit thrush, and wood thrush), and ruffed grouse. White-tailed deer, black bear, fisher, northern watershrew, red-backed and mountain dusky salamanders, and a variety of other reptiles, amphibians, and mammals use the upland habitats of the refuge. The upland spruce forests provide specialized habitat for saw-whet owl, yellow-rumped warbler, blackburnian warbler, snowshoe hare, the West Virginia northern flying squirrel, and the threatened Cheat Mountain salamander. The grasslands near the valley floor host grassland bird species such as bobolink, Henslow's sparrow, grasshopper sparrow, eastern meadowlark, and savannah sparrow. Adjacent shrublands interspersed with grass-forb meadows host nesting field sparrows, chipping sparrows, and vesper sparrows.

Much of this upland is believed to have been part of the former expanse of red spruce forest. Early records describe the forest composition variously as also containing eastern hemlock, black cherry, and American beech. Spruce budworm or other infestations may have periodically killed swaths of the upland forests, making them more susceptible to lightning-strike fires or blow-downs from storms. Otherwise, large-scale disturbances prior to European settlement are expected to have been minimal.

Logging, initially for the red spruce and eastern hemlock, and in a second wave of more recent cutting for black cherry and other hardwoods, combined with agriculture and recreation uses has altered the composition and structure of these upland habitats. Following the logging of the early 1900s, the more gradual slopes of Cabin, Canaan, and Brown Mountains, and smaller ridges were cleared for pastureland and some later plowed for crops. These lower elevation "toe slopes" remain generally un-forested, as grasslands and shrublands.

Upland Early Successional Habitat

Managed Grassland

Refuge staff manages several former pastures as open grasslands, primarily for grassland bird breeding habitat. Prior to refuge acquisition, these fields were actively managed by the landowners as pasture and hayfields. These fields occur near the valley floor and on low broad ridges in the southern tracts of the refuge. Refuge fields are kept open by mowing, haying, or prescribed burning to slow the succession of forbs, woody shrubs, and trees into the fields. The dominant species of these fields are introduced cool-season grasses, including sweet vernal grass, orchard grass, velvet grass, and timothy. Reed canary grass is invading some of the fields and is controlled by herbicide spraying.

Old-Field

Similar to managed grasslands, old-field grasslands and grass-forb meadows are former pastures that have not reforested. However, these meadows were typically taken out of active management over 40 years ago, when they were purchased by the power company. The old-field community type is the second-most dominant type on the refuge, occupying approximately 15 percent of the refuge. These habitats occur on the lowest slopes and forest openings of Cabin and Brown Mountains, the northern and eastern perimeter of Middle Ridge, and along the eastern edge of the Blackwater River south of the confluence with the Little Blackwater River.

Poverty oat grass, deer tongue grass, bracken fern, hay-scented fern, wrinkle-leaf and grass-leaf goldenrod, and flat-top aster dominate these meadows. Dense patches of the introduced sheep fescue occur in the north-eastern fields

of the Main Tract. The meadows are broken by patches of Glade St. John's wort and blueberries. Hawthorns grow scattered throughout the meadows, creating a savannah-like appearance. The lack of woody regeneration in these fields—presumably former forest—after several decades of lying fallow, is notable.

Shrubland
In Canaan Valley, upland shrubland habitats occur on approximately 5.3 percent of the refuge lands. These shrublands occupy low slopes adjacent to wetlands transitioning to old-field grasslands or upland forests. The Herz tract supports the largest contiguous patch of upland shrubland on the refuge.

Shrubland habitats include pure or nearly pure stands of Glade St. John's wort, mountain holly, or hawthorn, or mixed shrublands that include velvet-leaf and upland low blueberries, arrowwood, and wild raisin. To provide singing grounds for breeding American woodcock, refuge staff mows approximately 30 acres of this habitat type on a rotational basis.

Ken Sturm/USFWS

Fall sunrise, Canaan Valley National Wildlife Refuge

Upland Forest

Northern Hardwood Forest
Upland deciduous forests, including northern hardwood forests, are the primary cover of the Allegheny Mountain Section ecoregion in West Virginia (67 percent; NRAC & WVCFWRU 2000). In Canaan Valley, northern hardwood forest is currently the predominant forest type occurring on over 6,403 acres. The northern hardwood forest community type also includes black cherry groves, upland aspen groves, and the unvegetated balds and ridges that occur within the forests.

Within northern hardwood forests, American beech, sugar maple, black cherry, and yellow birch are important canopy species. White ash, American basswood, hemlock, and red maple may also occur. Ground cover in some areas is dominated by hay-scented and New York ferns. In areas without these rhizomatous

ferns, lycopodiums, or spring ephemerals such as Jack-in-the-pulpit, trillium, Dutchman's breeches, wild leeks, and violets occur.

Prior landowners logged the northern hardwood forest beginning in the 1980s. Some tracts were logged as recently as 2001. Tables 3.8 and 3.9 list the volume and species of hardwoods removed during two of the most recent timber sales prior to refuge acquisition of the property (Scott Sidle, personal communication).

Table 3.8. Species and volume of hardwoods removed during 1998-2001 by Allegheny Power.

Species	Volume, International Scale (board feet)	% of Total
Sugar Maple	391,000	5
Red Maple	2,058,000	28
Black Cherry	3,980,000	55
Ash	45,000	0.5
Yellow and Black Birch	27,000	0.5
Beech	262,000	4
Aspen	483,000	7
Total	7,246,000	**100**

Table 3.9. Species and volume of hardwoods removed during 1995-1997 by Allegheny Power.

Species	Volume, International Scale (board feet)	% of Total
Black Cherry	9,297,000	63
Sugar Maple	1,473,000	10
Red Maple	982,000	7
Basswood	783,000	5
White Ash	1,340,000	9
Other	920,000	6
Total	14,795,000	**100**

Black cherry groves occur on 250 acres, typically on the low slopes near the valley floor. Black cherry *(Prunus serotina)* is the most important species in these groves, often occurring as pure stands. Red maple, serviceberry, quaking and big-tooth aspen may also occur, but infrequently. Club mosses, poverty oat grass, and blueberry are the dominant ground cover species. Upland quaking and big-tooth aspen groves account for approximately 6 acres of the northern hardwood forest community type. Goldenrods, bracken ferns, and oat grass compose the understory. As an early successional community, the aspen groves are being replaced by northern hardwoods. In order to regenerate aspen stands by root sprouting for early successional species such as woodcock, refuge staff has cut stands of upland quaking aspen. Fortney et al. (2005) consider both black cherry and quaking aspen groves rare community types because of their infrequent occurrence elsewhere in the Allegheny Mountain Section ecoregion (see below for an explanation of rare habitat types).

Upland balds occur on the high shoulder slopes of Cabin Mountain and continue outside of the refuge, to the east, ending at the eastern continental divide (Allegheny Front). These open grassy habitats and dwarf shrublands are dominated by mountain oat grass, wavy hairgrass, and upland low and lowbush

blueberries. Fortney et al. (2005) consider this habitat type rare, and expect the open, unforested condition to persist because of extreme temperatures and damage to vegetation by wind, ice, and snow.

Conifer (Spruce) / Mixed Forest
Conifer (Spruce)/mixed forest habitats in Canaan Valley include the hardwood/conifer mixed upland forests and conifer upland forests that occur on approximately 1.3 percent of Canaan Valley refuge. This percentage is similar to the 1.7 percent occurring within the Allegheny Mountain Section eco-region in West Virginia (NRAC & WVCFWRU 2000). Red spruce and coniferous habitats are believed to have been the dominant cover within the ecoregion prior to the logging of the early 1900s. Forest communities included in this type are Central Appalachian hemlock-northern hardwood forest, Central Appalachian spruce-northern hardwood mixed forest, red spruce forest, red spruce-yellow birch forests, and red spruce-hemlock-balsam fir forest.

The coniferous and mixed forests with a spruce component occur predominantly on the refuge's Kelly-Elkins tract near Cabin knob and Weiss knob on the slopes of Cabin Mountain. A spruce-hemlock-hardwood mixed forest occurs to the east of the Black Bear Woods housing development, adjacent to the wetlands of Bearden Flats. Spruce is regenerating in the understory of deciduous forests on the middle elevation slopes of Cabin Mountain, potentially converting these slopes to spruce-dominated forests over time. A small upland balsam fir forest occurs on the Cortland tract. Hemlock-northern hardwood forests typically border the high gradient headwater streams of Cabin and Brown Mountains. The refuge is actively working on red spruce ecosystem restoration through planting and experimental spruce release projects.

Rare Habitat Types

There are approximately 4,300 acres of rare habitat within Canaan Valley refuge, as defined by Fortney et al. (2005). The authors of this study defined rare plant communities as those having at least one of the following characteristics:

1) At least one dominant or co-dominant species with a limited distribution in the Allegheny Mountain Section of West Virginia.

2) The community in question must occur in a habitat type that is considered to have a limited or restricted distribution in the Allegheny Mountain Section (e.g. a wetland or grass bald).

3) The plant community type may be common, but it typically supports one or more rare plant species. Because of the overall limited area of wetlands in the un-glaciated Plateau, one the principal factors used to asses rarity was the occurrence in wetlands.

Forests are the dominant cover, over 80 percent in the Allegheny Mountain eco-region (NRAC & WVCFWRU 2000). Wetlands cover 4 percent. By Fortney's definitions, because wetland types are uncommon in the Allegheny Mountain Section of West Virginia, most of the wetland types in Canaan Valley are rare. Appendix A lists the rare plant communities on the refuge.

Plants, including Rare, Exotic and Invasive Species

Canaan Valley is recognized as having at least 583 plant species (Fortney 1975). A list of recently observed plant species on the refuge can be obtained by contacting the refuge. Forbs and creeping shrubs are the most abundant group of plants from this list, with 229 species. Graminoides (grasses, sedges, rushes, and their allies) are the next most abundant, with over 130 species. The number of species of ferns and fern allies is 35, and trees and shrubs is 89. Sedges (*Carex* sp.) are

the most abundant genus of plants, with 46 species. See Habitats and Vegetation Communities, above, for examples of plant species found in various habitat types.

There are no Federally listed threatened or endangered plant species on the refuge. The refuge, however, does provide habitat for many rare plant species that are tracked by the WVDNR Heritage Program and listed as critically imperiled, imperiled, or vulnerable. These plants are considered to be State species of concern. This designation does not provide Federal protection but indicates that the species is unique and/or rare enough to merit special consideration by WVDNR.

Botanists have recorded 73 State species of concern in Canaan Valley. Most of these species can be found in appendix A. The large size of Canaan Valley—10 times larger than other high elevation wetlands in the Allegheny Mountain Section ecoregion—supports a diversity of habitats rare in the region. Thus, while the valley is home to many State rare plants, few are considered rare throughout their entire growing range outside of West Virginia. However, twenty-eight species are listed as critically imperiled (S1) by the WVDNR Natural Heritage Program. NatureServe and the network of Natural Heritage programs rank four species (Appalachian blue violet, glade spurge, Appalachian oak fern, and Jacob's ladder) as globally vulnerable (G3), and none as globally imperiled (G1 or G2).

The cool, moist climate of the valley has maintained favorable growing conditions for northern plant species following the last glaciation. Balsam fir represents one of 109 plant species that have distinctly northern ranges but are able to persist in the valley. Twenty-three of these species and varieties have been reported from five or fewer locations in West Virginia (Hudgins and Scott 1988).

Exotic and invasive species are, so far, uncommon in Canaan Valley. An invasive cattail and yellow flag iris are becoming more abundant in nutrient-rich stream margins. Reed canary grass forms dense cover in poorly drained fields and substitutes poor-quality habitat for breeding grassland birds. For five years, refuge staff has controlled reed canary grass in an important grassland bird field by mowing and spraying.

Multiflora rose, autumn olive, barberry, and exotic pasture grasses are relicts of the agricultural and homestead use of the area. None are widespread, though multiflora rose is abundant in localized patches. Purple loosestrife, garlic mustard, Japanese stilt grass and Japanese knotweed grow nearby the refuge. Staff has hand-pulled garlic mustard yearly since 2005 and has sprayed multiflora rose with herbicide yearly since 2004 to control their spread in the area.

Fisheries Habitats and Resources

A total of 30 species of fish occur in the rivers, streams, and beaver ponds of the refuge and the Blackwater River drainage (Cincotta et al. 2002). Of these, 20 are native species and 10 are introduced non-native species. Historically it is likely that fish diversity in the Blackwater River headwaters area of Canaan Valley was limited due to the interruption and habitat barrier of Blackwater Falls, approximately 6 miles downstream from the refuge. These falls present a 65 foot vertical impasse which prevents migration of fish upstream into the Canaan Valley watershed. Fisheries resources were impacted greatly in the early 1900s as a result of timber removal and acid mine drainage. Fish species known or thought to occur in Canaan Valley are listed in appendix A. A list of the refuge's known and expected vertebrate species can be obtained by contacting the refuge or on the refuge website online at *http://www.fws.gov/canaanvalley/CVNWR-vertebrates.html*.

Four fish species once found in the Blackwater River drainage are now considered extirpated. These include the blackside dace, fantail darter, northern hogsucker, and river chub. These four species were considered native but possibly introduced to the Blackwater watershed. No recent surveys have documented these species on the refuge (Cincotta et al. 2002).

It is thought that many of the fish present in the valley occur as a result of either accidental angler releases or WVDNR introduced game species. Historical records indicate that brook trout were abundant in the Blackwater River before logging occurred. However, as railroads were extended into the valley, fires and sedimentation reduced water quality. As a result, brook trout disappeared from the main stem of the Blackwater River (Zurbuch, 2002). Other species thought to occur historically in the Blackwater include creek chub, bluntnose minnow, white sucker, stoneroller, Johnny darter, greenside darter, mottled sculpin and redside dace (Zurbuch 2002).

The first recorded fish stocking of the Blackwater River occurred in 1909 near Davis and consisted entirely of rainbow trout. Brook trout were also stocked near this location in 1910. By 1925 the WVDNR recorded stocking 30,000 brook trout in the Blackwater River and its tributaries (Zurbuch 2002). Stocking currently occurs at two locations on the south end of the refuge by the WVDNR (Blackwater River on Route 32 and Blackwater River on Timberline Road). Fish currently stocked in the Blackwater River are primarily brown trout and rainbow trout.

The WVDNR stocked largemouth bass in beaver ponds in the valley in at least 1963 and 1964 (WVDNR 1964). Since the refuge has been established, no bass stocking on refuge property has occurred.

About 20 large ponds currently exist but their capacity to support fish habitat is unknown. No inventory has been conducted to determine what existing beaver ponds still contain fish. Reports from anglers indicate that rock bass and largemouth bass are caught in beaver ponds receiving water from Glade Run on the east side of the refuge and the Blackwater River on the west side. Sunfish species such as bluegill and pumpkinseed are also reported from these ponds.

Brook trout are the only native salmonid to the Blackwater River. Naturally reproducing brook trout populations exist in several small cold streams that flow into the Blackwater River. Although no refuge-wide survey has been accomplished, populations of brook trout are known from Idleman's Run, Freeland Run and Yokum Run. There are historical documentations in the Little Blackwater River, North Branch, Flag Run and two other small tributaries in the valley. Additionally, some limestone springs have been noted with brook trout on the south end of the refuge.

A survey of Freeland Run in 2001 by WVDNR found 18 brook trout and 17 brown trout in a 250 foot section of the stream. Both species were found primarily as young of the year fish and indicating successful spawning and recruitment of both species. Brown trout likely inhibit habitat expansion by the native brook trout and are present in high concentrations in areas such as Freeland Run. A survey of Idleman's Run in 2008 by WVDNR found over 60 brook trout in a 350 foot section of stream. However, these trout were separated into three disjunct areas of the stream due to low water flows, partially caused by an upstream water diversion.

Redside dace, a rare medium sized minnow has also been found on the refuge. This species is listed as a State species of concern (S1S2) and is known from only 9 localities in West Virginia (Stauffer et al. 1995). Historic records document this species occurring in Freeland Run, Sand Run and the North Branch. Records of

this species in the 1940's and 1950's were apparently common in Canaan Valley occurring in small tributaries as well as the main stem of the Blackwater River (Cincotta et al. 2002). However surveys by the WVDNR in recent years have found this species only in Freeland Run and only one individual was found. It is possible that habitat alteration from development and other land use practices have degraded stream conditions precluding redside dace.

Wildlife

The refuge supports a diversity of wildlife in forest, meadow, riparian and wetland habitats. A total of 286 species of fishes, amphibians, reptiles, mammals and birds are known or expected to occur in the Canaan Valley. Much of the wildlife is typical of the West Virginia-Pennsylvania highlands border region. Commonly observed species include white-tailed deer, raccoon, black bear and Canada goose. However, the high elevation and large amount of wetlands provide habitat for some species more typical of northern latitudes such as the fisher, saw whet owl and Wilson's snipe. The land is managed and protected to maintain biological diversity and to protect and benefit threatened and endangered species and resident and migratory birds. There have been wildlife studies in the Canaan Valley prior to acquisitions by the Service but most are currently unavailable. A list of the refuge's known and expected vertebrate species can be obtained by contacting the refuge or on the refuge website online at *http://www.fws.gov/canaanvalley/CVNWR-vertebrates.html*.

Waterfowl

Although limited, the refuge provides an important contiguous wetland habitat for breeding and migratory waterfowl in West Virginia. Migratory birds are seen moving through the area in March-April and August-October. Common migratory waterfowl include divers such as lesser scaup, ring-necked duck, bufflehead, hooded merganser and dabblers such as green-winged teal and blue-winged teal.

The refuge has small numbers of breeding waterfowl including American black ducks, mallards, wood ducks, and Canada geese. Studies conducted from 1980 through 1993 found Canada geese, mallards, wood ducks, and black ducks to be the most abundant waterfowl in Canaan Valley (Michael and Brown 2002). Of the species present on the refuge, black ducks are the only species of management concern. Listed by the WVDNR as a species of special concern (S2B: very rare or imperiled) black ducks breed in secluded beaver ponds, oxbows, and wetland areas, mostly in the northern portion of the refuge. Black ducks are also a Service species of management concern covered by the North American Waterfowl Management Plan (NAWMP) (ACJV1988) with population and management objectives.

Canada geese were brought into the valley by the WVDNR beginning in 1967. Between 1967 and 1971 a total of 65 geese were released in Canaan Valley (Michael et. al. 1994). The program began through a transplant program to encourage a local nesting population in the valley. Since that time, Canada geese have been successful in nesting throughout the valley with flocks numbering over 300 birds. The geese are the only migratory flock in West Virginia, arriving in Canaan Valley in the early spring and departing in November. At least some of the geese have been reported wintering near Durham, North Carolina (Michael 1994).

The development of Timberline Resort, a residential community, and the Canaan Valley Resort State Park golf course increased the available browse habitat which has increased numbers of geese using the area. These developments may have allowed goose numbers to increase since the 1980's. Goose abundance increased to a level causing Timberline residential community to initiate an active hazing program to prevent goose use of the open water and grassland habitats within the development.

Waterbirds and Shorebirds

Waterbirds commonly observed on the refuge include great blue heron, green heron, and American bittern. Great Blue and green herons were found to be the most abundant waterbirds during surveys conducted from 1980 to 1993 (Michael and Brown 2002). All but the great blue heron have been documented as breeding birds on the refuge. In fact, the valley is the largest single breeding location in the State for American bitterns (Mitchell 2006).

Rails are occasionally heard on the refuge. Breeding records exist only for Virginia rail which has been documented in the upper Glade Run marshes and in isolated cattail stands throughout the refuge. During migration, sora rails are seen in some wetland areas around beaver ponds. King rails *(Rallus elegans)* may also migrate through the valley; however, no recent records exist for this species on the refuge.

Ken Sturm/USFWS

Wilson's snipe

Only five shorebirds are regularly seen on the refuge: greater yellowlegs, spotted sandpiper, solitary sandpiper, American woodcock, and Wilson's snipe. Of these the woodcock and snipe are common and breed on the refuge. Spotted sandpipers are found during summer months and likely breed along streams and beaver ponds on the refuge. Greater yellowlegs and solitary sandpipers use the refuge during migration in low numbers.

The refuge serves as one of West Virginia's largest concentration of woodcock and Wilson's snipe. The valley has been noted for a large woodcock migration in the fall. Although dated, WVDNR reports that the fall population of woodcock likely exceeds 2,200 individuals. Resident numbers of woodcock have been estimated at 450 individuals.

Breeding woodcock surveys have been conducted at the south end of the refuge since 1999. Average number of "peenting" males on the refuge has been 3.32 per route which exceeds the long-term State average of 0.52 males per route. Although refuge routes are not chosen randomly and therefore can not be directly related to standardized singing ground survey route data, the high response rate on refuge routes likely indicates that the refuge is still important for breeding woodcock in the State and region.

Woodcock habitat loss in the northeast is largely attributed to successional changes in forest and open land and loss of agricultural land through urban development. This holds true for Canaan Valley where open land has been developed in recent years, grazing has decreased and early successional forest cover has matured. Nonetheless, recent research found that the Canaan Valley still contained the largest amount of quality habitat in the State (Steketee 2000). The refuge conducts habitat management for woodcock including maintaining singing ground habitat and improving early successional aspen and alder cover for foraging and breeding habitat.

Wilson's snipe breed on the refuge and it is one of the southern most breeding sites for this species in the East. Snipe have a limited distribution in the State and have been documented as breeders in only three locations including Canaan Valley (Buckelew and Hall 1994). Although no large scale snipe surveys have been conducted on the refuge, coincidental surveys of woodcock have documented snipe breeding activity. Snipe are typically found throughout the northern portion of the refuge during summer months in wetlands and around beaver ponds. Nesting

snipe have been also documented in the refuges grassland management fields on the southern part of the refuge.

Landbirds

At least 181 bird species have been recorded in Canaan Valley (Northheimer 2002). Migratory birds pass through the valley and have been well documented by long term banding and monitoring along the Allegheny Front. Refuge landbird point counts have documented a total of 104 species breeding on the refuge. Almost one third of all species documented during landbird point counts are in the sparrow family.

The refuge lies within Bird Conservation Region (BCR) 28; the Appalachian Mountain Region, Physiographic Area 12. There are at least 25 species listed within Physiographic Area 12 that occur or nest on the refuge. Of these at least 16 regularly breed on the refuge including golden-winged warbler, Canada warbler, Henslow's sparrow and scarlet tanager. Two of these species (Henslow's sparrow and golden-winged warbler) are also on the American Bird Conservancy "Green List" of species with the highest continental conservation concern.

Raptors
A total of 15 raptor species have been documented on the refuge. Common *Buteo* raptor species on the refuge include red-tailed hawk, broad-winged hawk, and red-shouldered hawk. Both red-shouldered and broad-winged hawks are known to nest in the valley. Rough-legged hawks winter in Canaan Valley hunting over maintained grasslands in the southern end of the valley. Rough-legged hawks are typically the most abundant Buteo on the refuge during winter, although Christmas Bird Counts have documented occurrences of most others in the surrounding area.

Northern harriers, a State species of concern, are a regular migrant during spring and fall to the refuge. Records of harriers in June and July in the northern portions of the refuge are fairly common; however, no breeding activity has been documented and no known breeding records exist for northern harriers in the State (Buckelew and Hall 1994). Harriers hunt over the expansive wetland habitats in the northern portion of the refuge as well as grassland and wet meadows in the southern portion.

Both turkey vultures and black vultures occur on the refuge. Turkey vultures are common and have been documented breeding on both Brown Mountain and Cabin Mountain in recent years. Black vultures mainly occur in the Blackwater Canyon area and are only occasionally seen in the Canaan Valley.

American kestrels occur regularly in the valley, particularly in the southern end associated with open grassland habitat. Merlin are occasionally observed on refuge lands. Peregrine falcons have been seen in the valley but are considered to be accidental. Both Cooper's hawk and sharp-shinned hawk are relatively common and breed on the refuge. Northern goshawk, a State species of concern, was documented nesting near Sand Run in 1975. Although no recent nesting records exist for this species in the valley, a nest was confirmed on Canaan Mountain in 2006. Recent observations of juvenile goshawks in the Freeland Run area and Beall Tract have indicated that some refuge habitats are being continually used by this rare northern species. Bald eagles regularly use the area during winter months and golden eagles are occasionally seen on the refuge.

Nonpasserines
Species in this group are limited to only a few species and include hairy woodpecker, downy woodpecker, yellow-shafted flicker, yellow-bellied sapsucker, pileated woodpecker, belted kingfisher, and ruby-throated humming bird. All but

the yellow-bellied sapsucker (a BCR species of concern) are known to nest on the refuge.

Non-passerine species are mostly tied to wooded environments for foraging and nesting. All but the ruby-throated hummingbird are cavity nesters. Only the belted kingfisher is a wetland species, and it is often found hunting along the Blackwater River or one of its many tributaries. Yellow-shafted flickers are most common during migration when they are often seen foraging in grasslands, woodlots, and edge habitats.

Passerines
There are 88 species of passerines known to occur on the refuge, out of which at least 69 have nested. Many of these species are migratory; however Christmas Bird Counts have documented at least 35 passerines on the refuge or within the count circle. The refuge lies adjacent to a major fall land bird migratory route over the Allegheny Front: it serves as the eastern continental divide. The oldest continuously operated banding station occurs along the Allegheny Front which was established by George Hall and the Brooks Bird Club in 1957.

The refuge's diversity of habitats allows a wide variety of species to occur. Unique habitats include wetland (open water, palustrine, shrub and forested) and high elevation spruce and mixed spruce-hardwood forests. Refuge breeding landbird surveys were established to develop a comprehensive list of breeding birds across representative habitat types. Since one of the refuge's unique qualities is the extent of wetland habitat, many sampling points fall in and adjacent to wetland habitat.

Based on results from breeding bird surveys from 1996 to 2008, the species with the highest relative abundance is the common yellowthroat which comprised approximately 8 percent of all landbirds recorded. Red-winged blackbird, red-eyed vireo, savannah sparrow, field sparrow, and song sparrow all make up a significant portion of the total species abundance on the refuge.

Land Mammals

The refuge provides habitat for an estimated 50 species of mammals. Most are considered year-round residents with the exception of migratory bats. The most conspicuous mammal is the white-tailed deer which has reached high densities in the southern portion of the valley including the refuge. Deer browse pressure is heavy in the south end of the valley and likely a limiting factor to the regeneration of several plant species, most notably balsam fir.

Wetland areas support populations of beaver, muskrat, and mink. River otter are also found in small stream reaches such as Glade Run but are considered rare on the refuge. Research conducted by Francl (2003) on the refuge found nine species of small mammals in refuge wetland habitats. Two species documented, the southern bog lemming and meadow jumping mouse are State species of concern and tracked by the Natural Heritage Program. Except for the southern bog lemming, other species documented in this study are considered habitat generalists which may reflect the small size of wetlands studied rather than depicting true small mammal wetland communities on the refuge (Francl 2003). Another State species of concern, the eastern small-footed bat, was documented along the Blackwater River in 2006 by refuge staff using acoustical survey equipment.

Upland areas support species such as long-tailed weasel, bobcat, striped skunk, red fox, grey fox, and black bear. The refuge supports small populations of mammals more typical of northern climates such as fisher and snowshoe hare. Species of concern include the southern water shrew, southern pygmy shrew, long-

tailed shrew, meadow jumping mouse, Appalachian cottontail rabbit, southern rock vole and the Allegheny woodrat. The Allegheny woodrat has a confirmed record in Canaan Valley, but habitat for this species is considered limited on the refuge. Historical records indicate that the Appalachian cottontail rabbit has been documented in and around Canaan Valley, although no confirmed records exist for the refuge.

The West Virginia northern flying squirrel has been successfully trapped and monitored at one location on the refuge but is expected to range throughout the higher elevations of the Kelly-Elkins Tract. Nest box surveys have found nest material consistent with northern flying squirrel occupation in drainages from 3,500 feet up to 4,200 feet on Cabin Mountain. One pregnant female was documented in a nest box in mixed spruce-hardwood forest adjacent to an old road bed in 2003. As an endangered species the West Virginia northern flying squirrel was identified as a high priority in the State Wildlife Action Plan (WVDNR 2006). The species was also used as an indicator of quality spruce and mixed spruce-northern hardwood forest habitat by the USFS in their recent Forest Plan (USFS 2006a). Since the squirrel was de-listed the Service is still committed to monitoring refuge populations. The species is still considered a good indicator of quality spruce and mixed-spruce hardwood forests and therefore remains as a focal species for habitat management. The Service developed a Red Spruce-Northern Hardwood Ecosystem MOU with multiple Federal, State, and NGO partners. The vision of the MOU includes specifically to "…provide functional habitat to sustain the viability of the West Virginia northern flying squirrel…" (USFWS 2007b). As an active partner in the MOU, the refuge will still consider the West Virginia northern flying squirrel a focal species.

Reptiles and Amphibians

Ten species of reptiles and 18 species of amphibians are known or likely to occur on refuge lands. The most notable of these is the Federally threatened Cheat Mountain salamander which occurs in high elevation spruce and hardwood forests.

Ken Sturm/USFWS

American toad

Wetland areas provide habitat for pool breeding amphibians such as wood frogs, spotted salamanders, and American toads. Many pool breeding sites on the refuge are artificially created impoundments or historical ruts in logging roads or rail grades. Two species of frog reported in Canaan Valley but without recent documentation are American bullfrogs and leopard frogs (Pauley 2002). The most ubiquitous species of frog is the northern spring peeper which is found throughout the valley in all wetland habitat types. Wetland habitats with moss cover often provide habitat for four-toed salamanders, however this species uses hardwood forests during the remainder of the year.

Upland habitats such as high elevation spruce forests, mid and low-slope northern hardwood forests and old field areas provide habitat for most salamander species. Lungless salamanders (Plethodontidae) are the dominant amphibians in the refuge's forested habitats. Cheat mountain salamanders are found in small pockets of high elevation mixed spruce forest, but red-backed salamanders are the most common species in refuge forests. Large salamander species in woodland habitats include Wehrle's salamander and northern slimy salamander.

Reptile species are poorly documented in Canaan Valley. Only one study indicates an effort to inventory reptile species (Michael 1993) and no reptiles were reported from his field investigations. Refuge staff observations have confirmed the presence of 9 snakes, with two other species likely to occur. The timber

rattlesnake may occur in higher elevations of the refuge but no observations have been made to document its presence within the Canaan Valley watershed.

Two turtles have been confirmed on the refuge. The common snapping turtle is apparently the most abundant species and is found throughout the refuge, mostly associated with beaver ponds and oxbows. The eastern box turtle was originally not known from Canaan Valley, but observations of two individuals (a male and female) in 2005 and 2006 document its presence in the area.

Invertebrates

Only a few studies have been conducted on invertebrates on the refuge. Two inventories were conducted by Butler (1981, 1987) on Freeland Run for aquatic invertebrates. The inventory was conducted as part of an evaluation of a nearby sewage treatment facility. Butler noted a combined total of 22 species representing 25 families of invertebrates (Butler 1988). Additionally it was noted that over the sampling period, numbers of aquatic invertebrates were reduced indicating that Freeland Run had been altered reducing its ability to support a full diversity of aquatic life (Butler 1987).

A study of carabid beetles was conducted on the refuge in 1999 by the USFS. A total of 98 species were collected during the study. Of this, 23 were new records for the State (Davidson and Acciavatti 1999). This study documented 25 percent of the recorded State invertebrate records occurring in Canaan Valley. Freeland Tract had the greatest diversity of carabid beetles as well as harboring 10 new State records. These were species with more northern distributions and their discovery on the Freeland Tract extended their known range distribution further south in the eastern United States.

The refuge began a dragonfly and damselfly inventory during the 2005 field season. To date a total of 14 species of damselfly and 33 species of dragonfly have been collected from refuge tracts. While none of the odonate species collected on the refuge are globally rare, at least 13 of the species are listed as State species of concern. The diversity of odonates found on the refuge is remarkable and is an indicator of wetland health and quality.

There are several invasive pest invertebrate species on the refuge. Balsam wooly adelgid has infected most stands of balsam fir on the refuge and surrounding areas. This aphid species has been known in Canaan Valley since at least 1993. Most trees affected by the adelgid succumb within a few years. Additionally, hemlock wooly adelgid has been found at the State Park where it has killed many trees in a drainage area adjacent to the ski lodge. This species of adelgid poses a significant threat to riparian and forested wetland areas on the refuge.

One mussel species, the creeper *(Strophitus undulates)*, has been found on the refuge. This species was documented in 2000 in the Blackwater River on the Beall Tract. Habitat for mussels may be limited to the areas of the river flowing through Middle Ridge where river substrate may be more suitable. No surveys have been conducted for the distribution of this species on the refuge or within the Blackwater River drainage. Fingernail clam, a freshwater clam species, has been found in Freeland beaver pond and several surrounding streams on the refuge.

Butterflies and moths have been sporadically surveyed on the refuge and efforts are ongoing to further document these species. Monarchs and various swallowtail and fritillary species are commonly seen. At least three State species of concern, the Atlantis fritillary, the pink-edged sulphur and Harris's checkerspot have been documented on the refuge.

A survey of land mollusks on the refuge began in 2007 as a part of a statewide atlas project. While species collection and identification is still ongoing, 82 species of land snails have been documented from the refuge, including one species, *Ventridens arcellus,* which had not been collected from Tucker County in over thirty years and is a classic high elevation species often associated with limestone outcroppings. While the State rank of *V. arcellus* is currently under review, it is probable that the species will be included on the State species of concern list as an S1 or S2 species. Two snail species found on the refuge have been identified as potentially new to science (Dourson 2009). Two slugs, one native and one introduced, and at least two species of aquatic snails have also been documented from the refuge during this survey. Land snail abundance and diversity can be used as an indicator of forest and soil health.

Invasive and Exotic Wildlife Species

European starlings occur most commonly at the south end of the refuge in grassland and small woodlot habitats. As aggressive cavity nesters, they undoubtedly compete with native species such as eastern bluebirds, house wrens and tree swallows for available nest sites. Several non-native species of fish have been introduced into the Blackwater River and tributaries. Many of these introductions have occurred as a result of angler bait releases. As mentioned before, both balsam and hemlock wooly adelgid have been documented on the refuge.

Federally Endangered and Threatened Species

The refuge provides habitat for one threatened and one endangered species. The threatened Cheat Mountain salamander and the endangered Indiana bat have both been documented on the refuge. The West Virginia northern flying squirrel which occurs in refuge forests was de-listed as an endangered species in September 2008. The bald eagle, delisted in August 2007, uses the refuge during migration. Both the West Virginia northern flying squirrel and the bald eagle, although delisted, remain priority species for Service protection and management.

USFWS

Bald eagles

Both the Cheat Mountain salamander and West Virginia northern flying squirrel have only been documented on Cabin Mountain in the south eastern portion of the refuge. Both species require high elevation mixed spruce and hardwood forests. Cheat mountain salamanders occur in

patchy distributions above 3,800 feet and are likely limited by alterations in forest cover through historical unmanaged fires and logging activities. The smallest population of the salamander occurs on Cabin Knob with a known occupied habitat of only 0.5 acres. The largest known site on the refuge occupies at least 20 acres closer to Bald Knob.

In 1967, the Federal Government listed the Indiana bat *(Myotis sodalis)* as endangered because of declines in their numbers documented at their seven major hibernacula in the Midwest (USFWS 2007a). At the time of their listing, Indiana bats numbered around 883,300. Surveys in 2007 numbered the Indian bat population at 513,000 bats which in a 9.4 percent increase over the 2005 estimate and is also the highest estimate reported since systematic surveys began in the early 1980s. The 2007 range-wide population increase is attributed to significant population increases in Indiana, New York, Kentucky, and West Virginia (data is available from the Service at *http://www.fws.gov/midwest/Endangered/mammals/inba/*). More recent range-wide population estimates are not currently available. However, the emergence of White Nose Syndrome in 2007 and associated mortality in subsequent years has likely reduced populations of these bats in affected areas, including New York, Vermont, New Hampshire and Pennsylvania. With the discovery of White Nose Syndrome in Virginia and West Virginia in 2009, further mortality is likely to occur.

Indiana bats were documented on the refuge for the first time through acoustical monitoring conducted by the USFS in 2003 (Ford 2003). Indiana bats were found foraging at two locations in the south end of the refuge. The refuge began conducting acoustical surveys in 2005. These surveys have documented three likely Indiana bat observations in the same location as the 2003 survey during 2005, 2007, and 2008. Additionally, acoustical surveys documented one new location for the species during 2007. Indiana bat calls have been documented from the refuge in the months of May, July, August, and September. It is probable that these bats were migrating and using the refuge as summer habitat for a maternity colony, since no known hibernacula occur within Canaan Valley. Because acoustical surveys are not 100 percent accurate and the Indiana bat has a call similar to the more common little brown bat, future surveys will include mist net operations to further document the use of the refuge by this endangered species.

Even though they are delisted, bald eagles are still protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act and remain a species of management priority for the Service. Bald eagles use the refuge primarily from late fall to early spring. Generally bald eagles observed are juveniles although adults are seen each year. Up to six bald eagles have been observed together on the refuge at one time. Typically eagles are seen singly during winter months foraging over the wetland areas in the northern portion of the refuge. No known nesting occurs in the vicinity of Canaan Valley.

State Listed Species

West Virginia does not have State threatened or endangered species legislation. However, the State does maintain a list of tracked wildlife and plant species. These are referred to as State species of concern and have been noted in previous sections where appropriate. Rare species are assigned ranks by the WVDNR Natural Heritage Program and global ranks by NatureServe.

Canaan Valley has at least 73 documented plants and 69 animal species recognized as either Federally threatened or endangered, or considered rare and ranked as a State species of concern. The number of rare animals documented on the refuge is expected to increase with continuing surveys of invertebrate species. The complete list of rare species known or expected to occur on the refuge is attached as appendix A.

Special Uses

Scientific Research

It is a Service policy to encourage and support research and management studies to provide scientific data which will help refuge staff develop appropriate management decisions on national wildlife refuges. Priority is granted to studies that contribute to the enhancement, protection, use, preservation, and management of native wildlife populations and their habitats. All special use permits issued for research specify that they be conducted in a manner to cause minimal effects on wildlife and habitat. Canaan Valley refuge has consistently worked with a variety of university, State, and Federal entities on mutually beneficial research projects.

Public Access, Education and Recreational Opportunities

This section describes the public access, education and recreation opportunities at Canaan Valley refuge. See map 3-3 for existing public use opportunities on the refuge. Recreation features and access points on the refuge are available from the refuge website at *http://www.fws.gov/canaanvalley/CVNWR-trails.htm*.

The refuge does not have a visitor use plan. However, we implement many visitor opportunities and programs. Additionally, the refuge visitor's center was recently renovated to include new interpretive displays and landscaping to improve the visitors' experience. With the help of volunteers, the refuge has continued to improve trails on the refuge including the construction of an Americans With Disabilities Act compatible boardwalk on the Freeland Tract. A total of 31 miles of refuge roads and trails are maintained for priority public uses and are accessible by pedestrian (including cross-country skiing and snowshoeing), bicycling, and horseback. During winter months an additional 10 miles of commercially run cross-country ski trails are open as part of the White Grass Touring Center. Wildlife watching trails (including winter ski trails) provide year-round wildlife viewing opportunities to thousands of visitors annually.

The refuge has developed environmental education programs with the help of interns from local colleges and universities. Guest speakers are recruited for weekend programs. Refuge staff also provide a small number of programs, depending on their individual workloads.

Public Access

The refuge is open daily from one hour before sunrise until one hour after sunset. There are currently five access points for trails: Freeland Road, Forest Road 80, Cortland Road, Camp 70 Road and A-frame Road. Visitors may also float through the refuge by small watercraft, canoe, or kayak when water levels allow it. Refuge entrance and programs are currently all offered free of charge.

Wildlife-Dependent Recreation

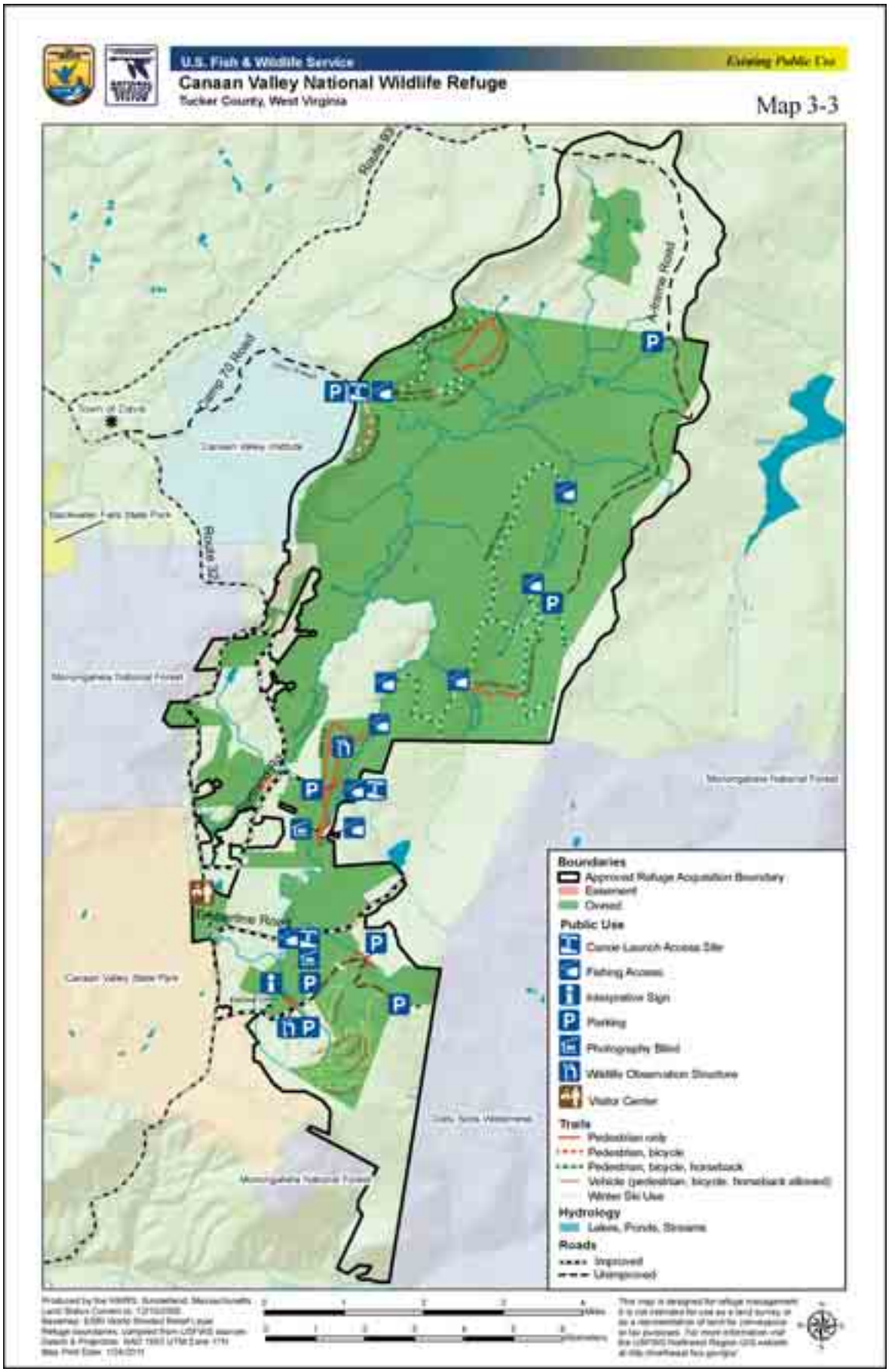
More than 20,000 people per year visit the refuge to participate in a variety of wildlife-dependent recreational and educational activities. These include wildlife observation, photography, interpretation, environmental education, hunting and fishing. A 31-mile road and trail system and Visitor Center support these activities.

Wildlife Observation and Photography

Wildlife observation and photography promote understanding and appreciation of natural resources and their management on all lands and waters in the refuge system. Per the 605 FW 4 and 5 policies, we strive to follow these guiding principles for wildlife observation and photography opportunities at the refuge:

1) Provide safe, enjoyable, and accessible wildlife viewing and photography opportunities and facilities;

2) Promote visitor understanding of, and increase visitor appreciation for, America's natural resources;


U.S. Fish & Wildlife Service
Existing Public Use
Canaan Valley National Wildlife Refuge
Tucker County, West Virginia
Map 3-3
Route 93
Allegheny Road
Camp 70 Road
Town of Davis
Canaan Valley Institute
Blackwater Falls State Park
Route 32
Monongahela National Forest
Canaan Valley State Park
Boundaries
Approved Refuge Acquisition Boundary
Easement
Owned
Public Use
Canoe Launch Access Site
Fishing Access
Interpretive Sign
Parking
Photography Blind
Wildlife Observation Structure
Visitor Center
Trails
Pedestrian only
Pedestrian, bicycle
Pedestrian, bicycle, horseback
Vehicle (pedestrian, bicycle, horseback allowed)
Winter Ski Use
Hydrology
Lakes, Ponds, Streams
Roads
Improved
Unimproved

3) Focus on providing quality recreational and educational opportunities, consistent with Service criteria describing quality found in 605 FW 1 Part 1.10; and,

4) Minimize conflicts with visitors participating in other compatible wildlife-dependent recreation activities.

Mary Konchar

Wildlife photography

Although the refuge offers quality wildlife observation and photography experiences year round, the most popular seasons for this activity are summer and winter. The refuge's location, with its wildlife diversity and mosaic of habitats and trail access to those habitats, makes it a popular place for birdwatchers. In fact, Canaan Valley refuge is considered by many to be one of the best birding areas in West Virginia. The refuge's trail system currently offers a variety of opportunities for visitors interested in short or long trail segments and options for trail loops. Volunteers help to maintain the trails through the Adopt a Trail program administered by the Friends of the 500th. A boardwalk, constructed by the Friends of the 500th and the Youth Conservation Corps (YCC), provides access to a viewing platform overlooking a beaver pond and a stand of balsam fir for physically disabled visitors. Pedestrian trails are also available for cross country skiing. Currently, twenty-three miles of the trail system are open for bikes and twenty-two miles are open for horse-back riding. Dogs are permitted if kept on the trail and on a leash while on the refuge. Dogs may also be used for certain types of hunting. Wildlife observation is also conducted by refuge visitors entering the refuge by canoe or kayak. A detailed list of the different access points and trails on the refuge follows.

Freeland Road Access: Freeland Road provides access to two short pedestrian trails (Freeland Trail and Idleman's Run Trail) and to Forest Road 80 (FR80).

- *Freeland Trail (0.24 mi):* Nice views abound on the Freeland Trail. A short universally accessible boardwalk trail leads through a wet field to a spring-fed beaver pond. Around the pond, visitors may walk to a stand of balsam fir.

- *Forest Road 80 (2.0 mi):* Forest Road 80 is a maintained gravel road through forested habitat, including spruce forest at the summit. It is open for pedestrians, bicyclists, horseback riders, and licensed vehicles. It provides access from the valley to Dolly Sods Wilderness Area.

- *Idleman's Run Trail (0.39 mi):* A short pedestrian path runs through forest along Idleman's Run through a northern hardwood forest. Visitors can create a loop by walking down Forest Road 80 and returning to the parking area at the beginning of Idleman's Run.

Cortland Road Access: This provides access to the Beall (pronounced bell) trails. These trails are open for pedestrian use only. A total of 4.5 miles of trail can be hiked on Beall.

- *Beall North Trails (3.2 mi):* Beall north trails pass through forest, field and wet swale habitats, with a spur to a small bog and another spur to the Blackwater River.

- *Beall South Trails (1.3 mi):* Offer visitors good opportunities for viewing and hearing grassland birds, before dipping into the forest, down to the Blackwater River.

Camp 70 Access: Camp 70 Road (0.8 mi) leads to the Camp 70 Loop Trail, the Swinging Bridge Trail and the Brown Mountain Trails. The one mile section of Camp 70 Road that is on the refuge is currently a State road which has been unmaintained for many years. This section of road traverses the refuge and provides access to the Loop Trail at the end of the road.

- *The Camp 70 Loop Trail (2.8 mi round trip):* This trail travels east from the Camp 70 parking area. This extension of the State road is open for pedestrian, horse, bicycle and vehicle use, until the loop at the end, which is closed to vehicles. Traveling this trail, visitors start in the woods, and gradually the valley opens up before them. At the ending loop there are excellent views of the valleys, wetlands and close-up views of beaver ponds.

- *The Swinging Bridge Trail (1.1 mi):* This trail crosses the Blackwater River and provides access to refuge land on Canaan Mountain and connects to Canaan Valley Institute land which is also open for recreational use. This trail is open for pedestrian and bicycle access.

- *The Brown Mountain Trail (2.4 mi):* This trail is open to pedestrian, horse, and bicycle use. It is a pleasant trail through forest land, with a gently increasing grade. It leads to the Brown Mountain Overlook Trail (1.96 mi), a loop which provides a beautiful overlook of the refuge's wetlands. The Brown Mountain Overlook Trail is open for pedestrians only.

A-Frame Road Access: The rest of the refuge trails are accessible from A-frame Road.

- *A-frame Road (4.8 mi in the refuge):* This is a public access route open for pedestrian, horse, bicycle and vehicle use. From route 93 to the parking lot at the end of the gravel A-frame Road is nine miles, 4.8 miles through the refuge and 4.2 miles through private land. For most of its length the road passes through the forested slopes of Cabin Mountain. In a few places, there are nice "overlook" views of the refuge. The primary parking area is near the beaver ponds along Glade Run. Parking is also permitted on the side of the road, wherever it does not impede traffic.

- *The Valley Overlook Trail (0.06 mi):* This is a short steep climb from A-frame Road, shortly after the road enters the refuge, to a clearing on the slope of the northeastern side of the refuge. On a clear day, visitors experience a beautiful view of the entire valley from this spot. The refuge currently wants to re-route the trail to reduce its gradient, making it accessible for more visitors. This trail is open to pedestrians.

- *The Cabin Mountain Trail (2.0 mi):* This trail begins at the A-frame Road parking area. It also provides access to Sand Run Trail. It begins with views of the Glade Run beaver ponds, then travels through forest habitat. Excellent views of the refuge and the entire Canaan Valley can be seen from the summit of this trail. This trail is open to pedestrian, horse, and bicycle use. A variety of forest birds and wildlife can be encountered on this trail.

- *Cabin Mountain Spur (0.7 mi):* This trail begins at the parking lot at the end of A-Frame Road. It travels through forested habitats to overlooks on Cabin Mountain. The overlook on Cabin Mountain Spur is on private land, after leaving refuge land. Visitors should have the permission of the landowner before traveling there. This trail is open to pedestrian, horse, and bicycle use.

- *Sand Run Trail (0.94 mi):* Sand Run Trail starts off of Cabin Mountain Trail. The trail goes through forested habitat down to the valley floor, travels through wetlands, crosses a stream and rises to meet Middle Valley Trail. This trail is open to pedestrian use only.

- *South Glade Run Crossing (0.9 mi):* This trail starts shortly after Cabin Mountain Trail starts its gradual climb. This trail is similar to Sand Run trail in that it goes through forested habitat, wetlands, and crosses Glade Run, then rises to meet Middle Valley Trail. This trail is open to bicycle, horseback, and pedestrian use.

- *Middle Valley Trail (6.2 mi):* The south end of Middle Valley Trail meets the border of Timberline residential community. The north end of the trail turns east, crosses Glade Run, then travels uphill to A-frame Road. Middle Valley Trail provides an opportunity to experience the refuge's wetlands, grasslands, and forests. Alder thickets, which attract a variety of unique plant and animal species, can be viewed on the northern portion of the trail. This trail is open to pedestrian, horse, and bicycle use.

- *Blackwater View Trail (1.4 mi):* The Blackwater View Trail begins near where the Middle Ridge Trail borders the Timberline residential community. It then travels down the slope of Middle Ridge to the Blackwater River. This trail is open to pedestrian, bicycle, and horseback use.

Interpretation

The refuge's interpretive mission is as follows: By interpreting the biological treasures entrusted to the refuge's care, visitors will understand what we do and be motivated to play an active role in environmental concerns here and at home.

A new visitor center was opened to the public in summer 2001. The visitor center has an interpretive exhibit room with displays that focus on the Canaan Valley, the Service and the Refuge System. A 20-person audio/visual room, with full audiovisual capacity, is used for the Refuge Orientation Video, special events, lectures, and training sessions. New exhibits were installed in 2006, and a native plant garden was installed for outdoor interpretation in 2007. In fiscal year 2008, the visitor center was open 234 days, serving 5,778 visitors.

The visitor center is open Monday, Wednesday, and Friday from 8:30 am to 3:00 pm, and on Saturday from 10:00 am to 4:00 pm, as staff and volunteers are available. During the peak summer season the visitor center is generally open seven days a week, depending on the availability of interns and volunteers. When available, trained refuge volunteers staff the information desk, answer questions, hand out brochures, and sell items from the cooperating association sales outlet. The Friends of the 500th, a non-profit support group, operates the sales outlet and helps support refuge projects and programs.

Refuge staff and volunteers conduct special events throughout the year to help people learn more about, and contribute to management of the refuge's fish and wildlife resources. Offsite events include booths at the Mountain State Forest Festival, Hooked on Fishing Not on Drugs (HOFNOD) Expo, and the Tucker County fishing derby. Onsite special events include Woodcock Round-up for Earth Day, Migration Bird Count for International Migratory Bird Day, Wild School day for children, and the Valley Vibes Program, a monthly program for families on the local area's natural history. The refuge also hosts a variety of volunteer work days for fence removal, tree planting, and a Christmas Bird Count. In 2008, volunteers contributed 702 hours to these special events.

Interpretive tours are given to help visitors learn more about the refuge's fish and wildlife resources. The refuge also partners with White Grass to provide environmental education and interpretive tours during the winter months. Tours and programs are led by staff, volunteers, or researchers on the refuge. In Fiscal Year 2008, 55 on-site interpretive programs served 822 visitors. This includes 35 interpretive walks on the refuge, with 408 people attending, and 20 indoor interpretive programs, with 414 participants attending.

Fishing

Per the 605 FW 3, we strive to follow these guiding principles for recreational fishing opportunities at the refuge:

1) Effectively maintain healthy and diverse fish communities and aquatic ecosystems through the use of scientific management techniques;

2) Promote visitor understanding of, and increase visitor appreciation for, America's natural resources;

3) Provide opportunities for quality recreational and educational experiences consistent with criteria describing quality found in 605 FW 1.6;

4) Encourage participation in this tradition deeply rooted in America's natural heritage and conservation history; and

5) Minimize conflicts with visitors participating in other compatible wildlife-dependent recreational activities.

A compatibility determination was completed and approved in 2003 for fishing on the refuge. Current numbers of anglers using the refuge is estimated at 550 per year. The most popular locations for fishing access include the Blackwater River (along Timberline Road and Rt. 32) and beaver ponds in the north end of the valley.

Anglers must have a valid State license to fish on the refuge. Anglers can access rivers, streams, or ponds wherever a road or trail intersects these waterways. Most anglers fish for trout. Fishing activity is highest after the State stocks rivers and streams.

Hunting

The refuge first opened for hunting in 1996. The most recent Hunt Plan and Environmental Assessment were revised in 2007. The refuge prepares annual hunt programs, seeks State review, and makes revisions to the refuge hunt program when necessary. For example, in 2002 the refuge began requiring hunters to obtain refuge hunting permits on an annual basis. The hunt program is managed to meet refuge priority public use goals, and manage deer populations. See map 3-4 for the existing refuge hunt map.

Approximately 98 percent of the refuge is currently open to hunting, with most seasons following the State seasons. Areas closed to hunting follow the original 1996 hunt plan and most tracts in the southern portion of the refuge are closed to rifle hunting due to community safety concerns.

The following are guiding principles of the hunting program, according to new Fish and Wildlife policy (605 FW 2):

1) Manage wildlife populations consistent with Refuge System-specific management plans approved after 1997 and, to the extent practicable, State fish and wildlife conservation plans;

2) Promote visitor understanding of and increase visitor appreciation for America's natural resources;

3) Provide opportunities for quality recreational and educational experiences;

4) Encourage participation in this tradition; and

5) Minimize conflicts with visitors participating in other compatible wildlife-dependent recreational activities.

Hunting is permitted in accordance with State seasons and regulations, Federal laws, and refuge-specific regulations. Except for spring turkey season, the refuge is closed to hunting from March 1 to August 31. The refuge began issuing formal hunting permits during the 2002 season after the acquisition of the Main Tract. An annual average of 1,819 refuge hunt permits has been issued since the 2002 season. In fiscal year 2007, hunters spent an estimated 690 hunter-days on the refuge.

The following game species may be taken on refuge lands during applicable seasons: white-tailed deer, black bear, wild turkey, ruffed grouse, mourning dove, waterfowl, coot, rail, gallinule, snipe, woodcock, rabbit, hare, squirrel, red fox, gray fox, raccoon, bobcat, woodchuck, coyote, opossum, and striped skunk. All other species of wildlife are protected. Hunters must carry a valid State hunting license, refuge hunt permit and a photo ID to hunt on the refuge.

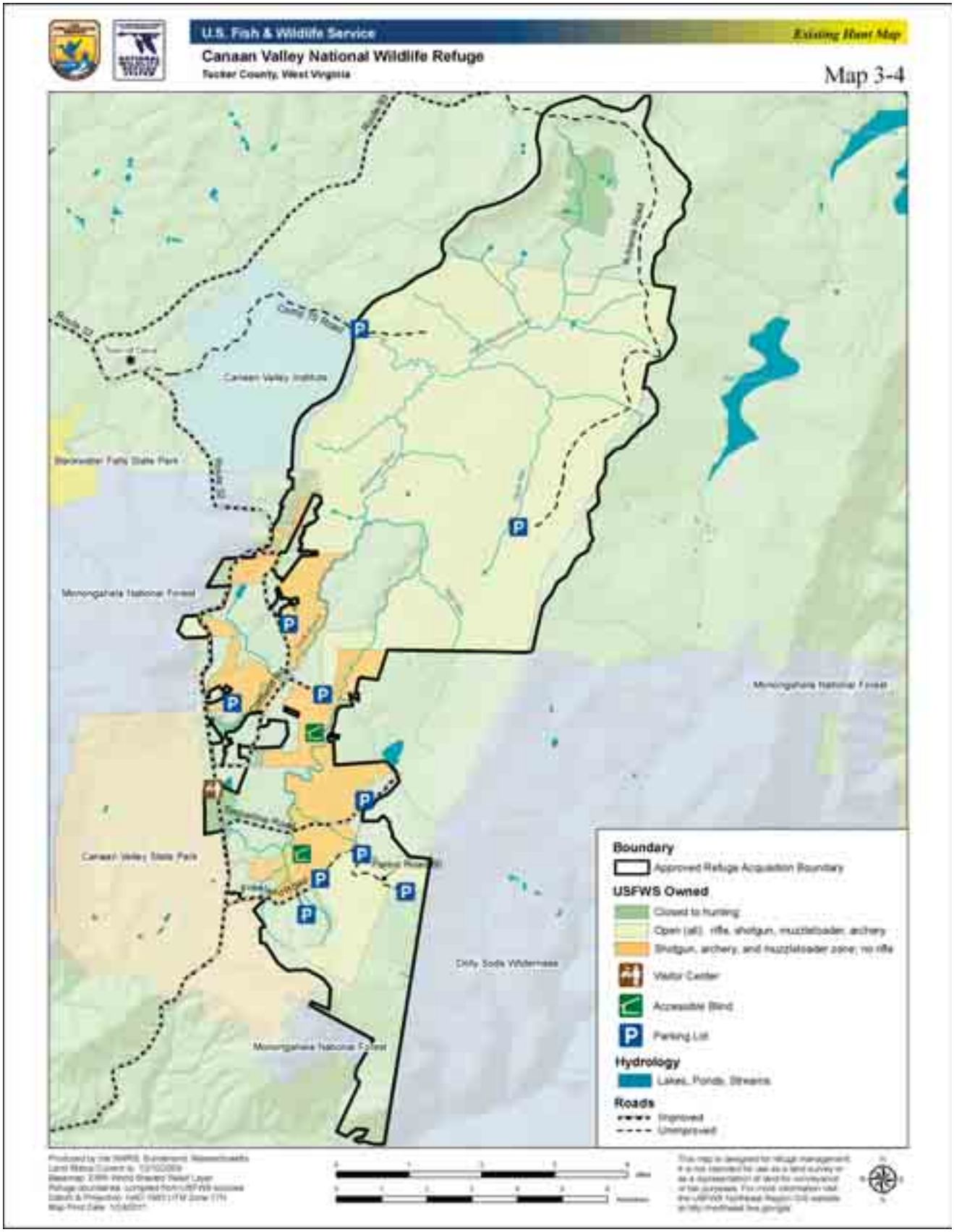
Dog training and field trials are not permitted on the refuge. However, hunting dogs are permitted for raccoon, grouse, woodcock, and black bear hunting seasons, according to State and refuge specific regulations.

Environmental Education

Per the 605 FW 6, we strive to follow these guiding principles for environmental education opportunities on the refuge:

1) Teach awareness, understanding, and appreciation of our natural and cultural resources and conservation history.

2) Allow program participants to demonstrate learning through refuge-specific stewardship tasks and projects that they can carry over into their everyday lives.


U.S. Fish & Wildlife Service
Existing Hunt Map
Canaan Valley National Wildlife Refuge
Tucker County, West Virginia
Map 3-4
Canaan Valley Institute
Blackwater Falls State Park
Monongahela National Forest
Canaan Valley State Park
Dolly Sods Wilderness
Boundary
Approved Refuge Acquisition Boundary
USFWS Owned
Closed to hunting
Open (all): rifle, shotgun, muzzleloader, archery
Shotgun, archery, and muzzleloader zone; no rifle
Visitor Center
Accessible Blind
Parking Lot
Hydrology
Lakes, Ponds, Streams
Roads
Improved
Unimproved

3) Establish partnerships to support environmental education both on- and off-site.

4) Support local, State, and national educational standards through environmental education on refuges.

5) Assist refuge staff, volunteers, and other partners in obtaining the knowledge, skills, and abilities to support environmental education.

6) Provide appropriate materials, equipment, facilities, and study locations to support environmental education.

7) Give refuges a way to serve as role models in the community for environmental stewardship.

8) Minimize conflicts with visitors participating in other compatible wildlife-dependent recreation activities.

The refuge maintains a small environmental education program. Teachers and youth group leaders may make reservations to bring classes to the refuge for environmental field trips. Staff or volunteers assist with school field trips as time and schedules permit. Teachers may also lead their own field trip, tying in field activities to what the students are learning back in the classroom. The Friends of the 500th help schools pay for buses for student field trips to the refuge.

The refuge environmental education programs reach many area school children. In 2008, 345 students attended on-site programs and 153 students attended off-site programs.

Marquette Crockett/USFWS

First grade field trip, Freeland Tract

The refuge partners with a local group, Tucker County Connections that hosts a three-day camp for County's fifth grade students. The goal of the camp is to connect local students with their environment through interactive educational programs related to local culture, human and natural history. The refuge hosts a field trip for the fifth graders as part of their three day camp. Refuge staff also helps with other activities as schedules permit.

The refuge provides environmental education programs for the local Girl Scout day camp, located at Blackwater Falls State Park. Each year, the Girl Scouts focus on two badges related to nature and outdoors that they work on during the three days of camp. Staff works with the park naturalist to plan and present activities for the Girl Scouts to meet the badge requirements related to natural history and the environment.

The refuge also presents a one day program called Wild School Day to educate the County's sixth grade students about fish and wildlife. Ten to twelve stations teach students about fishing skills, aquatic habitats, boating, raptors, snakes, birds, and more. The whole refuge staff gets involved, as do staff from the WVDNR, the USFS (Monongahela National Forest), Canaan Valley Institute, and refuge volunteers.

Teachers and youth leaders may borrow curriculum materials from the refuge library to help them prepare lessons about the environment both at school and on field trips. Currently the Friends of the 500th are working to catalog library materials. Once cataloged, the Friends will advertise the availability of materials in the library.

Cultural Resources

Service cultural resource staff in the regional office review construction projects and changes to buildings on the refuge for potential to affect archeological sites and historical structures. The Service consults with the West Virginia Department of Culture and History (the West Virginia State Historic Preservation Office [SHPO]) in compliance with the National Historic Preservation Act during these projects. In preparation for the CCP, the Service prepared archaeological overviews for the refuge. These include pre-contact period archaeological sensitivity maps and a field reconnaissance by the Tucker County Highlands History and Education Project that yielded historic archaeology site inventory forms, locations, and descriptions for historic period resources on the refuge. Structures over 50 years old are inventoried and evaluated by an architectural historian as needed.

Four archaeological surveys have been conducted on lands the refuge now owns. Two of these were field surveys in areas once proposed for construction projects. In 1995, Cultural Resource Analysts, Inc. conducted a survey involving field testing for a planned resort expansion now included in refuge ownership. This survey identified the historic Freeland farmstead building sites, including the house, springhouse, storehouse, and privy. Census records showed that in 1880, James Freeland, who came to Canaan Valley in 1872 as one of the first settlers, with Isaac and Manerva Freeling (sic.) lived in the house with Isaac and Manerva's two daughters. A third child died in 1889.

In 2002, Mid-Atlantic Archaeological Research located the only known prehistoric archaeological site on the refuge. This prehistoric site yielded sparse chert flakes and a biface fragment in shovel pits. These results were interpreted as showing evidence of an ephemeral camp or resting spot as people hunted or sought other resources. The Service altered the location of the proposed building project to an area which contained no archaeological sites.

A third small project-oriented survey by Service staff revealed no sites during subsurface testing.

In addition to these archaeological field surveys, a prehistoric archaeology overview was contracted to Michael Baker Jr., Inc. in 2007. The reconnaissance overview study, "Prehistoric Archaeological Background Study for a Comprehensive Conservation Plan of Canaan Valley National Wildlife Refuge, Tucker and Grant Counties, West Virginia," included no field work. The report contains palaeoenvironmental information about the refuge and develops a model of prehistoric site location. Using variables such as slope, historic disturbance and distance to water, a map of high and medium potential sites for prehistoric resources was created. However, the report notes that due to the extensive timbering, farming and fire history of Canaan Valley, many sites on the valley floor may be heavily disturbed. The greatest potential for preserved prehistoric sites may be under the relatively recently formed peat deposits. These sites would not be found through shovel test pits.

A corresponding overview of historic settlement and development has been produced for the CCP by a committee of the Friends of the 500th, the Tucker County Highlands History and Education Project (TCHHEP). This overview summarized the early settlement and development of Canaan Valley by European Americans and included a field component. The work of TCCHEP identified 76 sites on or near refuge land which were considered potential historic archaeological sites. A subset of these sites was investigated in detail, and all were recorded and identified in a report submitted to the refuge in 2007. One example of the work documented in the report is a grave site located in a wooded section of the Main Tract. Investigations by the TCHHEP found that the general

location was the home site of George W. Leatherman. According to TCHHEP, Leatherman was a very early settler of Canaan Valley purchasing land totaling over 2,300 acres in 1875. The grave includes a head and footstone formed from sandstone slabs. The headstone indicates the burial of G.S.L. in 1880 and could be the oldest grave in Canaan Valley. This document will prove invaluable for avoiding negative impacts to historic resources during habitat management and visitor services development at Canaan Valley National Wildlife Refuge.

Ken Sturm/USFWS

A headstone belonging to a member of the Leatherman family and located on refuge-owned land.

Chapter 4

Ken Sturm/USFWS

Hermit Thrush

Management Direction and Implementation

- Introduction
- Development of Refuge Goals, Objectives, and Strategies
- General Refuge Management
- Refuge Goals, Objectives and Strategies

Introduction

This CCP includes an array of management actions that, in our professional judgment, work toward achieving the refuge purposes, the vision and goals for the refuge, and State and regional conservations plans. In our opinion, it will effectively address the key issues. We believe it is reasonable, feasible, and practicable.

In all program areas, this CCP will enhance the quality and sustainability of current resource programs, develop long-range and strategic step-down plans, and promote partnerships.

Development of Refuge Goals, Objectives, and Strategies

We presented the refuge goals in chapter 1. Developing refuge goals was one of the first steps in our planning process. Goals are intentionally broad, descriptive statements of the desired future condition for refuge resources. By design, they are less quantitative, and more prescriptive, in defining the targets of our management. They also articulate the principal elements of refuge purposes and our vision statement and provide a foundation for developing specific management objectives and strategies.

Objectives are essentially incremental steps toward achieving a goal; they also further define the management targets in measurable terms. Objectives provide the basis for determining more detailed strategies, monitoring refuge accomplishments, and evaluating our success. U.S. Fish and Wildlife Service (Service) guidance in "Writing Refuge Management Goals and Objectives: A Handbook" (USFWS 2004a) recommends that objectives possess five properties to be "SMART": (1) specific; (2) measurable; (3) achievable; (4) results-oriented; and (5) time-fixed.

A rationale accompanies each objective to explain its context and why we think it is important. We will use the objectives to write refuge step-down plans. We will measure our successes by how well we achieve those objectives.

We next identified strategies for each of the objectives. These are specific actions, tools, techniques, or a combination of those that we may use to achieve the objective. The list of strategies under each objective represent the potential suite of actions to be implemented, and by design, most will be further evaluated as to how, when, and where they should be implemented in refuge step-down plans.

We developed a habitat management map, a public use map, and a hunt map to accompany the text. Using Geographic Information Systems (GIS) mapping tools and data sets, the habitat maps are intended to help readers visualize where the refuge will conduct habitat management strategies on the ground. The habitat management maps are not meant to identify exact locations for implementing a particular strategy on the ground. Explanation of habitat management strategies are detailed further in the objectives section under each goal. It will be up to our refuge staff to decide during the implementation phase what specific strategy applies to a particular site, at what level or timing it should apply, and exactly where it applies on a given site. These actions will be detailed in the annual Habitat Management Plan (see "Refuge Step-Down Plans" below) and annual work plans.

The public use maps are intended to show the reader where the refuge will add new infrastructure for visitor use, such as new trails and new observation platforms. In some cases, the Service will need to conduct additional NEPA analysis before deciding where to build new trails and other infrastructure. Engineers and other professionals will assist with this analysis. The hunt maps illustrate which areas of the refuge will be open to hunting.

General Refuge Management

We primarily developed our management direction hierarchically, from goals to objectives to strategies. However, we also found that many actions we wanted to highlight either relate to multiple goals or represent general administrative or compliance activities. We present those below.

Developing Refuge Step-down Plans

Service planning policy identifies 25 step-down plans that may be applicable on any given refuge. We have identified the six plans below as the most relevant to this planning process, and we have prioritized them. Sections of the refuge Habitat Management Plan (HMP) which require public review are presented within this document and will be incorporated into the final version of the HMP. We will also develop an annual HMP and Habitat and Species Inventory and Monitoring Plan as the highest priority step-down plans. These are described in more detail below. They will be modified and updated as new information is obtained so we can continue to keep them relevant. Completion of these plans supports all five refuge goals.

The following step-down management plans are to be completed as follows:

- A Habitat Management Plan (HMP), immediately following CCP approval (see discussion immediately below).
- An Annual Habitat Management Plan (AHMP), within 1 year of CCP approval (see discussion below).
- A Habitat and Species Inventory and Monitoring Plan (HSIMP), within 2 years of CCP approval (see discussion below).
- Fishing Plan within 2 years of CCP approval.
- A Visitor Services Plan, within 3 years of CCP approval.
- A Law Enforcement Plan, within 3 years of CCP approval.
- Facilities and Sign Plan, within 3 years of CCP approval.

Habitat Management Plan (HMP)

A HMP for the refuge is the requisite first step to achieving the objectives of goals 1–3. The HMP will incorporate habitat objectives developed herein, and will also identify "what, where, how, and when" actions and strategies will be implemented over the 15 year time frame to achieve those objectives. Specifically, the HMP will define management areas, define treatment units, identify type or method of treatment, establish the timing for management actions, and define how we will measure success over the next 15 years. In this CCP, the goals, objectives, and list of strategies under each objective identify how we intend to manage habitats on the refuge. Both the CCP and HMP are based on current resource information, published research, and our own field experiences. Our methods, timing, and techniques will be updated as new, credible information becomes available. To facilitate our management, we will regularly maintain our GIS database, documenting any major vegetation changes on at least a 5-year basis.

Annual Habitat Management Plan and Habitat and Species Inventory and Monitoring Plan (AHMP, HSIMP)

The AHMP and HSIMP for the refuge are also priorities for completion soon after CCP approval. Like the HMP, these plans are also vital for implementing habitat management actions and measuring our success in meeting the objectives. The AHMP is generated each year from the HMP, and will outline specific management activities to occur in that year. The HSIMP will outline the methodology to assess whether our original assumptions and management actions are, in fact, supporting our habitat and species objectives. Inventory and monitoring needs will be prioritized in the HSIMP. The results of inventories

and monitoring will provide us with more information on the status of our natural resources and allow us to make more informed management decisions.

Refuge Staffing and Administration

It is important to recognize that additional staffing and funding will be necessary to implement the CCP. In appendixes F and G we identify the level of funding and staffing needs based on this management action. However, our budgets are determined annually by Congress and distributed through our Washington and Regional offices before arriving at field stations. Therefore, the refuge does not have total control over its annual allocation of resources. Below we describe activities related to staffing, administration, and operations. Implementing these activities supports all our refuge goals.

Operational Budgets and Permanent Staffing
One of our objectives is to sustain annual funding and staffing levels that allow us to achieve our refuge purposes, as interpreted by the goals, objectives, and strategies. Many of our most visible projects since refuge establishment were achieved through special project funds that typically have a 1- to 2-year duration. While these funds are very important to us, they are limited in their flexibility since they typically can not be used for any other priority project that may arise. As previously mentioned, funding for land acquisition is derived primarily from two sources—the Land and Water Conservation Fund and the Migratory Bird Conservation Fund. Funds from these sources are generally directed at specific acquisitions.

A Regional Plan was developed in FY 2007 to implement a new approach to budgeting. The goal of base budgeting was to have a maximum of 75 percent of a refuge station's budget cover salaries and fixed costs, while the remaining 25 percent or more will be operations dollars. The intent of this strategy was to improve the refuge manager's capability to do the highest priority project work and not have the vast majority of a refuge's budget tied up in inflexible, fixed costs.

Appropriateness and Compatibility Determinations

Chapter 1 describes the requirements for appropriateness and compatibility determinations. Appendix B consists of approved appropriateness and compatibility determinations to support the activities in the CCP. We will only allow activities determined compatible that meet or facilitate refuge purposes, goals, and objectives (603 FW 2) (2000).

When the Service acquires land within the current acquisition boundary in full, fee-simple ownership, we will consider public access and compatible public recreation, and other refuge uses, consistent with what we currently allow on the existing refuge lands. Each acquisition is reviewed for compatible priority public uses which may get incorporated into the management of that parcel. When a conservation easement, or a partial interest, is purchased, the Service's objective is to obtain all rights determined necessary to ensure protection of Federal trust resources on that parcel. Typically, at a minimum, the purchase will include development rights. However, we may also seek to obtain the rights to manage habitats, and/or to manage public use and access, if the seller is willing and we have funding available.

Wildlife-Dependent Recreational Program

With the assistance of the Service's Regional Visitors Services Review Team, two public use program emphases have been determined for this refuge: wildlife observation and hunting. This determination was based on careful consideration of our natural resources, existing staff, operational funds, existing and potential facilities, and which programs we will be most effective in providing "quality" opportunities for visitors. The community survey we conducted with assistance from the U.S. Geological Survey (USGS) in 2007 (Sexton, N.R., et. al., 2009) indicates that self-guided interpretation and wildlife observation, and hunting

Mary Konchar

Birdwatching

are highly desired in the area. While all of the priority public uses are important, wildlife observation and hunting will receive greater emphasis. As always, we look to our partners, friends, and/or other volunteers to help develop and assist with the refuge's public use programs.

Refuge Operating Hours

The refuge is open from one hour before sunrise to one hour after sunset, seven days a week, to ensure visitor safety and protect refuge resources. However, the refuge manager has the authority to issue a special use permit to allow others access outside these timeframes. For example, research personnel may be permitted access at different times if necessary for successful completion of a research project.

Commercial and Economic Uses

All commercial and economic uses will adhere to 50 Code of Federal Regulations (CFR), Subpart A, §29.1 and Service policy which allow these activities if they contribute to the National Wildlife Refuge System (Refuge System) mission, or refuge purposes and goals. Allowing these activities also requires the Service to determine appropriateness and prepare a compatibility determination and an annual special use permit outlining terms, conditions, fees, and any other stipulations to ensure compatibility.

Reserved Rights

While purchasing land to complete the refuge boundary the Service has acquired land with reserved rights, rights-of-way, leases and other agreements. Currently there are over 37 reserved rights listed in realty files for land owned by the refuge. Most include rights for mineral extraction (oil and gas predominately) and rights to run power and gas lines across refuge lands to serve commercial and residential interests. The refuge will follow policy guidance when any of these reserved rights are exercised. Specifically we follow 50 CFR 29.21-9, ensure compliance under the refuge compatibility policy (603 FW 2) and biological integrity, diversity and environmental health policy (601 FW 3). Depending on the location and the extent of disturbance required to exercise reserved rights on refuge lands, other laws may apply. In general, the refuge will coordinate with all private parties exercising their rights to ensure the protection of refuge resources. The refuge will issue special use permits as necessary to manage these uses and to ensure that impacts to refuge resources are as low as possible.

Distributing Refuge Revenue Sharing Payments

As we describe in chapter 3, we pay annual refuge revenue sharing payments to counties based on the acreage and the appraised value of refuge lands in their jurisdiction. These annual payments are calculated by a formula determined by Congress, which also appropriates funding. We will continue those payments in accordance with the law, commensurate with changes in the appraised market value of refuge lands, or new appropriation levels dictated by Congress.

Community Relations

Knowing that public lands cannot survive without a constituency that supports them, the refuge will continue to build relationships that effect sound stewardship through partnerships developed in the communities we serve. We will continue to work within community forums such as the Tucker County Chamber of Commerce and town meetings, Rotary and other venues. Refuge staff will maintain an ongoing dialogue with our congressional delegation, the State of West Virginia, the Tucker County Commission, local elected officials, the business community and refuge neighbors. We will foster a spirit of cooperation with all of our stakeholders and be transparent in our management of lands entrusted to us by the American people.

Cultural Resources

As a Federal land management agency, we are entrusted with protecting historic structures and archaeological sites on our land which are eligible for, or listed on, the National Register of Historic Places. Service cultural resource managers in the regional office keep an inventory of known sites and structures and ensure that we consider them in planning new ground disturbing or structure altering changes to the refuge. They consult with the West Virginia Division of Culture and History (West Virginia's State Historic Preservation Office [SHPO]) concerning projects which might affect sites and structures, and conduct or contract archaeological or architectural surveys when needed. Projects can usually be redesigned to avoid affecting National Register eligible sites or structures or the Service would plan mitigation for the effects in consultation with the SHPO. The Service's existing practices with reference to National Historic Preservation Act compliance will continue. An architectural historian will inventory and evaluate historic structures on the refuge. When changes on the refuge involve structures over 50 years old, the Service will comply with Section 106 of the National Historic Preservation Act on a case by case basis.

Land Acquisition

Currently, the refuge comprises 28 tracts and protects 16,193 acres of wildlife habitat and wetland communities. We will continue to pursue acquisition from willing sellers of the 8,932 acres of land that remains privately owned in the refuge's approved acquisition boundary, potentially expanding the refuge's total acreage to approximately 25,000 acres. The remaining lands to be acquired include wetlands, riparian areas, grasslands, and upland forested habitats that provide important resting, nesting, and feeding locations for a host of migratory birds (waterfowl, wading birds, shorebirds, raptors, and songbirds) and threatened and endangered species. They also contain wetlands and rare plant communities. Upland communities also provide critical connections to protect and maintain the integrity of wetland habitat, one of the primary objectives in the establishment of the refuge.

Our preference will be to acquire new lands in fee simple since that method ensures full management control and flexibility. However, the method of acquisition will also take into consideration the needs and desires of the present landowner. As we acquire these lands, we will manage them according to the goals, objectives, and strategies of the CCP.

As land is evaluated for acquisition by the Service, the habitat types, habitat connectivity, related wildlife populations and plant community values are taken into consideration. Once acquired, management activities planned for new

property are considered relative to the amount of particular habitat types the property contains as well as the spatial relationship between habitat types on the property relative to habitat types on adjacent refuge land and other protected lands. These relationships help determine the types of potential management activities which the Service may apply to the new land acquisition. For example, new land acquisitions which contain pasture or other grassland habitat may be considered for continued grassland management for grassland obligate bird species if there are at least 50 acres of grassland within the newly acquired property or it is contiguous with existing refuge lands currently under grassland management. Lands which contain wetland habitat will be protected and management may include improving the buffering capacity of adjacent uplands by increasing riparian corridors if necessary and conducting restoration actions to prevent erosion or habitat fragmentation. Land which contains edge hardwood forested communities and aspen stands will be considered for successional forest management to provide young dense vegetation for priority early successional bird species. Conversely, forested habitat which is contiguous with stands of forest on existing refuge lands will be protected and restoration applied to improve forest interior breeding bird habitat or maintain movement corridors between the refuge and other protected lands in the watershed.

Any management activities considered will relate directly to priority migratory birds, threatened and endangered species protection and to the other purposes for which the refuge was established.

Youth Conservation Corps

We will maintain the annual Youth Conservation Corps (YCC) program which has generally consisted of a crew of four to five persons (15-18 years old), and a crew leader. This has been a popular program in the local community because local youth employment opportunities are limited. The crew accomplishes many important tasks in support of our visitor services programs, biological programs, and maintenance needs.

National Natural Landmark

The Canaan Valley was designated a National Natural Landmark (NNL) in 1974, a program managed by the National Park Service (Park Service). The NNL is currently 24,763 acres of which 16,054 are within the refuge. The purpose for the designation was to protect the relict boreal ecosystem, the high diversity of habitats, large areas of wetlands and opportunities for outdoor education and recreation in the valley. The Service will uphold the founding purposes for the establishment of the NNL and the refuge will work with the Park Service to further the purposes of the NNL in keeping with the purposes of the refuge and the mission of the Service.

Invasive Species

The Refuge System has identified management to control the establishment and spread of invasive plants as a national priority. Fortunately, on this refuge, the threat is currently low. However, our objective is to ensure no new invasive plant species become well established, and we will manage to control the spread of what does exist. To the extent possible, we will physically remove invasive species where they are encountered. We will use approved herbicides when determined by the refuge manager to be necessary to control invasive plants, after regional office review and approval. Of particular concern on the refuge are existing stands of multiflora rose, yellow iris, Japanese stilt grass, and garlic mustard. Other species such as purple loosestrife and Japanese knotweed are found nearby but have not yet been documented on refuge property.

In conjunction with the HMP and HSIMP, we will develop a list of species of greatest concern on the refuge, identify priority areas with which to be vigilant, and establish monitoring and treatment strategies. Refer to the National Wildlife Refuge System Invasive Species Management Strategy released in May 2003 (USFWS 2003) for additional tools, processes, and strategies. The 2003 report is complimented by a technical report issued in May 2004 by USGS and others,

titled: The Invasive Species Survey: A Report on the Invasion of the National Wildlife Refuge System (Simonson et al. 2004). These reports together give both a status review and a management strategy for combating invasive species. In addition, we will stay abreast of Service policy revisions currently being reworked to facilitate implementation. Other strategies will include:

- Institute proper care of all refuge equipment to avoid introduction or transport of invasive plants;
- Require researchers on the refuge to take steps to prevent transportation of terrestrial invasives, aquatic invasives and pathogens;
- Work with State and Federal agencies to prevent introduction of invasive species;
- Implement outreach and education programs, including signage, where appropriate, and actively support State initiatives on this topic; and,
- Develop special regulations on the refuge as warranted to control the spread of invasive species.

Implementing this program supports refuge goals 1-3 relating to the conservation of all wetland and upland habitats

Monitoring and Abatement of Wildlife and Plant Diseases

The Service Manual chapter on Disease Prevention and Control is not yet published. Until it is, we derive guidance on this topic from the Refuge Manual and specific directives from the Service Director. We will abide by the Refuge Manual and any specific directives when monitoring and abating wildlife and plant diseases.

USFWS

Canaan wetland

The Refuge Manual (7 RM 17.3) lists three objectives for disease prevention and control:

1) To manage wildlife populations and habitats so the likelihood of disease contraction and contagion are minimized;

2) To provide for early detection and identification of disease mortality when it occurs; and

3) To minimize losses of wildlife from disease outbreaks.

These objectives were published in 1982. Since that time, in addition to diseases that cause serious mortality among wildlife, more attention has been given to those diseases that are transmitted through wildlife to humans.

One serious wildlife disease receiving considerable attention worldwide is avian influenza. Of particular concern is the highly pathogenic Eurasian form (H5N1). In 2006, all refuges were instructed to prepare an Avian Influenza Surveillance and Contingency Plan. The plan for Canaan Valley refuge was approved in December 2006 and discusses methods for dealing with this disease.

In West Virginia, chronic wasting disease (CWD) is also of concern. This disease is a progressive brain

and nervous system disease found in deer and elk that ultimately causes death of infected animals. CWD was first documented in Hampshire County, West Virginia in 2005. The West Virginia Division of Natural Resources (WVDNR) has implemented control and monitoring actions since then which have resulted in the documentation of 45 deer testing positive for CWD in Hampshire County. Monitoring efforts have so far not confirmed CWD presence in deer anywhere else in the State. A CWD management plan for the refuge was approved in 2006.

Protecting Wetlands and Rare Plant Communities

The CCP recognizes the refuge's wetland complex as one of our most important management and conservation responsibilities. The wetlands in the valley represent the largest contiguous wetland complex in the State of West Virginia. These wetlands were also fundamentally important in the establishment of the refuge and are highlighted as important community types in both the West Virginia Conservation Action Plan (2006) and the U.S. Forest Service Final Land and Resources Management Plan (2006). The refuge protects at least 73 documented plant species of concern and much of the wetland area is comprised of unique and rare plant communities on a State and regional level. The Canaan Valley supports some of the State's largest and most stable populations of rare plant species, such as glade spurge and Jacob's ladder. More information about the rare plant species and communities the refuge supports and protects can be found in Chapter 3.

Research

Research will continue as a priority especially where related to wetlands, wildlife species of concern, and their habitats. Generally, we will approve permits for research projects that provide a direct benefit to the refuge or that will inform our decisions on managing natural resources for biological or public use programs on the refuge. The refuge manager also may consider requests that do not relate directly to refuge objectives, but instead relate to the protection or enhancement of native species and biological diversity in the region and support the goals of ecoregional conservation teams, such as the Atlantic Coast or Eastern Brook Trout joint ventures and the Central Appalachian Spruce Restoration Initiative (CASRI) working group.

All researchers are required to submit detailed research proposals following the guidelines established by Service policy and refuge staff. Special use permits will also identify the schedules for progress reports, the criteria for determining when a project should cease, and the requirements for publication or other interim and final reports. All publications will acknowledge the Service and the role of Service staff as key partners in funding and/or operations. We will ask our refuge biologists, other divisions of the Service, USGS, select universities or recognized experts, and the WVDNR to peer review and comment on research proposals and draft publications, and will share research results internally, with these reviewers, and other conservation agencies and organizations. To the extent practical, and given the publication type, all research deliverables will conform to Service graphic standards.

Some projects, such as depredation and banding studies, will require additional Service permits. The refuge manager will not approve those research projects until all required permits are received and the consultation requirements under the Endangered Species Act have been met.

Adaptive Management

We will employ adaptive management as a strategy to ensure we respond quickly to new information or events. The need for adaptive management is very compelling today because our present information on refuge species and habitats is incomplete, provisional, and subject to change as our knowledge base improves.

We will adapt our strategies to respond to new information and/or spatial and temporal changes or environmental events that may or may not have been predicted. We will continually evaluate management actions, both formally and informally, through monitoring or research, to consider whether our original

assumptions and predictions are still valid. In that way, management becomes a proactive process of learning what really works.

The refuge manager is responsible for changing management strategies if they do not produce the desired conditions. Significant changes may warrant additional NEPA analysis and public comment. Minor changes will not, but we will document them in project evaluation reports, or in our annual reports.

Generally, we can increase monitoring and research that support adaptive management without additional NEPA analysis, assuming the activities, if conducted by non-refuge personnel, are determined to be compatible by the refuge manager. Many of our objectives identify monitoring needs. Our HSIMP will determine what is planned in the foreseeable future. Implementing this strategy supports all five refuge goals.

NEPA requires site-specific analysis and disclosure of impacts in an environmental impact statement (EIS) for all major Federal actions. Other routine activities that have been found, individually and cumulatively, to have no significant effect on the environment, are categorically excluded from the NEPA requirements to prepare detailed environmental documents. Those generally include administrative actions.

Removing Surplus Structures and Site Restoration

The refuge will continue to address surplus structures currently located on Service-owned lands, and will develop a plan for removing structures on lands that are acquired in the future. Surplus structures include old hunting cabins, barns and hunting platform structures that are in disrepair and are not needed for Service use. These structures are not necessary and affect the aesthetic values of the refuge. Additionally most of these structures are not sound and therefore create a public safety issue. The refuge has worked with the West Virginia Department of Environmental Protection (WVDEP) Rehabilitation Environmental Action Plan (REAP) program to help remove most of these old, dilapidated structures.

The Service will also continue to address unnecessary access roads and skid trails located on Service-owned lands, and will develop a plan for removing these types of roads on lands that are acquired in the future. Following is a list of actions we will undertake to manage surplus structures and unnecessary access roads and skid trails:

- Within 3 years of acquiring property that includes a structure, determine if the structure is surplus to refuge needs and, if it is, remove the structure, assuming funding is available. The refuge will restore the site by re-grading it to natural topography and hydrology and revegetate it to establish desirable conditions.

- Within 5 years of CCP approval, inventory and assess all access roads, logging roads and skid trails within the refuge, and implement procedures to retire and begin to restore unnecessary forest interior, and secondary roads to promote watershed and resource protection. All off-road (ORV) and all–terrain vehicles (ATV) trails, and all unauthorized trails, will be eliminated to restore and protect refuge habitats and wildlife.

- Within 3 years of acquiring property that has access roads, logging roads, or skid trails, implement procedures to retire and restore any unnecessary roads to promote watershed and resource protection.

Implementing this program will support refuge goals 1-3 by protecting wetlands from erosion and sedimentation, by reducing transportation pathways for invasive species, and by helping to remove edge habitat.

Unexploded Ordnance: Public Safety and Remediation

As explained in chapter 2, "Affected Environment," the refuge recently became aware of the presence of unexploded ordnance left over from military training activities during World War II on refuge lands. To what extent refuge lands were used for target practice activities is unknown. Therefore, under this management action, we will coordinate with the Army Corps of Engineers to develop a step-down management plan on unexploded ordnance in order to addresses public safety and remediation.

Land Conservation Partnerships

We will continue to participate in land conservation partnerships with the goal to permanently protect and sustain Federal trust resources and other unique natural resource values in the Canaan Valley area and the Allegheny Highlands ecosystem. An important component of this commitment is to improve connectivity between existing conservation tracts and preserve public access. There is currently work towards encouraging conservation partnerships to evolve into a dynamic, landscape-level, multi-partner effort. The list of existing and potential partners is extensive and includes the Service, other Federal agencies, State agencies, private conservation organizations, local communities, private landowners, and private businesses. An example of these efforts is the CASRI a multi-agency, Non-Government Organization (NGO), and private land owner effort to conduct red spruce restoration throughout the Allegheny Highlands of West Virginia. Additionally, a public lands working group was established in 2007 to discuss conservation, public use, and other common issues with public land owners in the Canaan Valley area.

Managing Conservation Easements

The refuge currently is responsible for the management of two separate easements totaling 44 acres. A conservation easement is a legal agreement voluntarily entered into by a property owner and a qualified conservation organization such as a land trust or government agency. The easement contains permanent restrictions on the use or development of land in order to protect its conservation values. One easement managed by the refuge is within Canaan Valley, while the other, a Farmer's Home Administration (FmHA) easement is located in Crawley, WV. The refuge will still maintain management responsibilities for these easements including consultation with easement owners, invasive species control, inventory and survey requirements, boundary marking and law enforcement.

It is difficult to predict how much time and effort these responsibilities will require in the future. However, the refuge manager will continue to be responsible for managing conservation easements. If we were to begin sustained and systematic monitoring of these easements, rather than only the current opportunistic enforcement and invasive species control, the time commitment will be substantially greater than it has been to date. We do not anticipate having the staff available to monitor on a regular basis, but it is possible and desirable to begin a modest inventory, monitoring and invasive species control program on an annual basis on the easements.

The refuge will also consider additional conservation easements with private landowners. We will work with our realty office and other State, Federal and non-profit agencies to develop and leverage easement acquisitions when opportunities arise.

In the late 1980s to the mid-1990s, the Farmers Home Administration (FmHA) acquired many properties in central and southwest Virginia through foreclosure sales. Under the terms of a Memorandum of Understanding (MOU) between FmHA and the Service, a review team consisting of Service staff, and staff from the Natural Resources Conservation Service (NRCS), Farmers Home Administration, and Agricultural Stabilization and Conservation Service evaluated the properties for their conservation value. Based on the reviews, and prior to these properties being resold, permanent conservation easements were placed on some of these properties to protect wetlands and other important

wildlife habitats. Responsibility for enforcing and monitoring these easements rests with the Service, and that responsibility was delegated to the closest refuge manager.

The refuge staff has been conducting invasive species control operations at the Crawley easement as well as reposting boundaries and working with the land owners on trespass issues. Additionally, the staff was involved in working with the land owners to develop an access road to their home site within the easement boundary in 2001. These projects typically require two to three days of staff time to prepare for and conduct operations. In the past three years, the staff has spent an average of six staff days a year working on easement management issues.

The Service is in the process of reviewing and evaluating how refuges manage FmHA easements. Until a final decision is made on whether to change the status quo, we will continue to employ the following strategies to discharge our responsibilities in managing these easements:

1) Respond to reports of violations or possible violations as they become known. Work with landowners, utilizing partnerships where possible, to cooperatively resolve and remedy the violations. If necessary, work with the Regional Solicitor or US Attorney's Office to ensure remediation and future compliance; and

2) Develop a process to begin regular inventory and monitoring of FmHA easements so that each easement is visited annually. Work with partners and other Service offices to assist where possible. Conduct control operations for invasive species yearly on at least one visit.

Fire Management

The use of prescribed fire has been identified as a potential management tool for grassland and early successional habitat management in the CCP. The refuge will evaluate and use fire as a management tool when appropriate. Further details and guidance on using prescribed burns for habitat management can be found in the refuge's Fire Management Plan, which was approved in 2002 and revised in 2004. It is available by request (contact the refuge), or as a download on the planning website.

USFWS

Prescribed burns

Climate Change

The refuge recognizes that conditions related to global climate change may affect our ability to meet long term biological objectives. Across the Appalachian region, current observations have shown average temperatures to have risen more than 1.5°F; winter average temperatures by 4°F. In general, spring is arriving earlier, summers are growing hotter, and winters are becoming warmer and less snowy.

Utilizing the TNC Climate Wizard program we analyzed the potential temperature and precipitation changes predicted for West Virginia by the year 2050 using an average of the three main climate models (MIROC3.2, CSIRO-MK3.0 and UKMO-HADCM3). Annual precipitation was predicted to increase an estimated 10 percent; however most change was predicted during the months December–May. The warmer months of the year June–August indicated a 0-3 percent decrease in precipitation from historic conditions. Additionally July temperatures showed an increase of about 5° F. The Climate Wizard modeling program is considered more accurate for prediction of future temperature change than for precipitation and mostly from a continental perspective. As such more specific predictions at the State scale must be viewed as a coarse estimation based on best available climate modeling at this time. Future information will continually be sought to evaluate and model the potential effects of climate change on refuge resources.

Field et al (2007) reports that several species of animals in North America are responding to the effects of climate change. For example the increase in average spring temperatures have led to earlier nesting for 28 migrating bird species on the east coast of the U.S. (Butler 2003) and to earlier egg laying for tree swallows (Dunn and Winkler 1999). Several frog species appear to be responding by initiating breeding calls 10 to 13 days earlier than a century ago (Gibbs and Breisch 2001).

Information from Audubon's Christmas Bird Count found 58 percent of observed species are wintering significantly more north in latitude over the past forty years. Rising winter temperatures create more suitable habitat for species which previously wintered in more southern locations (Audubon 2009). Recommendations include protection of migratory bird habitat and improve it's resiliency through increasing connectivity and condition of existing habitat (Audubon 2009).

Habitat specialists, like many peatland dependent bird species, are expected to be even more heavily impacted by climate change effects due to their increased sensitivity to vegetation changes. Areas such as Finzel Swamp in Maryland have been studied to analyze the local effect of the peatland community on the avian assemblages. Results indicated that Finzel Swamp and areas such as Canaan Valley currently provide refugia for a unique and distinct bird species which contribute to the avian diversity of the State and region. This diversity could be lost over time if temperature changes greatly influence the peatland community persistence in high elevation Appalachian wetlands. (Yeany 2009).

Another example of the possible effects of climate change on the region is found with predicted effects on stream temperatures and their subsequent impact on native fish species. The Intergovernmental Panel on Climate Change (IPCC) (2007) estimates that a significant increase in average annual air temperature is projected to eliminate a large percent of the habitat of brook trout in the southern Appalachian Mountains. This effect is predicted well outside the planning window for this document. However, some actions can begin now to help mitigate predicted temperature increases in the region, such as reforestation of riparian corridors to improve shading effects.

Areas like Canaan Valley that are experiencing changes in average temperatures could also serve as some of the more important and resilient areas of the Appalachians due to higher elevations, existing and potential future plant communities, and frost pocket conditions. For example, the refuge's active role in spruce restoration on the refuge and throughout the region is thought to be a way to help reduce the severity of climate stresses on the variety of rare and endemic species associated with these forests and high elevation wetlands. Increasing historic conifer cover in headwater streams may help reduce the overall warming effects and help maintain coldwater fisheries on the refuge such as brook trout and redside dace.

Warmer winters and possible increased drought conditions could have the effect of increasing insect infestations on balsam fir, Eastern hemlock and American beech. The balsam and hemlock wooly adelgids which have infested stands of balsam fir and are beginning to affect hemlock stands in Canaan could increase in abundance with warmer winter temperatures and more generations may be produced if summer temperatures prolong the season. Drought conditions stress trees which can also increase their susceptibility to insect pests (IPCC 2007).

Maintaining and protecting the peatlands on the refuge will help regional carbon sequestration goals. Peatland communities are known to sequester greater amounts of carbon than other soil types. Analysis should be conducted to determine how climate change may influence the changes in peatland areas on the refuge, possibly moving them towards drier and therefore a more woody plant community type. If this occurs the potential conversion of peat soils may affect the amount of carbon sequestered in refuge wetlands.

Climate change will also likely create an increase in vegetative growth due to the increase of CO_2 in the atmosphere. With an increase in carbon dioxide one may expect an increase in photosynthesis and biomass production. Combining this information with predicted climate changes one may hypothesize that an increased vegetative productivity during a prolonged growing season combined with a possible decrease in summer precipitation could create drought stress conditions, particularly in the late summer. Increases in precipitation during the winter and spring months may exacerbate flooding conditions during snow melt.

Recommendations for forest management include planning for changes in plant communities and maintaining and increasing native and natural diversity to create a more resilient forest community. This may apply to the spruce forest habitat the refuge currently manages. Currently the spruce forest on refuge lands is fragmented and exists in relatively small patches. Through restoration work it may be possible to increase the patch size and connectivity closer to historic stable conditions of this northern forest type soon enough to help improve its resiliency to changes in average and seasonal temperature and precipitation patterns over the next 50 years.

Larger, mature trees with well established root systems will likely fare better during drought conditions than smaller less developed trees. Additionally a more mature and contiguous conifer cover in the higher elevations will help perpetuate cooler temperatures on the forest floor creating more conducive conditions for natural regeneration and perpetuation of associated wildlife such as the threatened Cheat Mountain salamander. Increasing the acreage of red spruce through restoration will likely increase the refuge's role in carbon sequestration as shade tolerant species like spruce are known to accumulate more carbon over time. Also, an increase in forest cover and mature forest stands will increase the carbon sink characteristics of the refuge forest habitat. Given the relatively high elevation and frost pocket conditions it is possible that habitats in Canaan Valley may develop into regionally significant refugia for vulnerable species.

Refuge plans for maintaining and increasing spruce cover fall into the category described by Millar et al 2007 as "resistance to change." In this paradigm management of an ecosystem so that it is more suited to resist the influence or forestall the undesired effects of climate change is pursued. In the case of the red spruce ecosystem in the central Appalachians, this may be the best course to take given the high biological diversity and sensitivity of species tied to this ecosystem. Additionally, restoring areas historically in red spruce forest will help lend resilience to this forest ecosystem (Millar et al 2007).

Several species may be used to monitor the long term effects of climate change to the refuge's biota. For example, spruce reliant song birds such as the blackburnian warbler may be an excellent indicator of the quality of the refuge's conifer forest habitat relative to climate change. Balsam fir represents one of 109 plant species that have distinctly northern ranges but are able to persist in the Valley. Twenty-three of these species and varieties have been reported from five or fewer locations in West Virginia (Hudgins and Scott 1988). One or several of these plant species could be used for long term climate change monitoring. Focal species tied to these unique habitats are likely to be the "canary in the coal mine" for changes in habitats tied to climate change. The refuge's list of focal species includes many of these and will incorporate their status into the continued adaptive approach to management during uncertain climate change scenarios.

The Service currently has a draft Strategic Plan for addressing climate change which will help guide refuge actions including planning, strategic habitat conservation, and adaptive management practices that will help us address climate change effects on refuge resources. Generally the refuge will continue to work with partners and encourage research and monitoring activities which will help build an information base with which to monitor changes and develop strategies to mitigate significant impacts over time. We will use adaptive management to evaluate conditions as they relate to our ability to meet our management objectives and integrate new management decisions into existing plans based on sound science and best professional judgment.

Wilderness Review

Refuge System planning policy requires that we conduct a wilderness review during the CCP process. The first step is to inventory all refuge lands and waters in Service fee simple ownership. Our inventory of this refuge determined that two areas met the eligibility criteria for a wilderness study area as defined by the Wilderness Act. However, the planning team decided not to recommend

Mary Konchar

Bobolink

wilderness designation at this time. The results of the wilderness review are included in appendix C.

Wild and Scenic River Review

Service planning policy also requires that we conduct a wild and scenic rivers review during the CCP process. We inventoried the river and river segments which occur within the refuge acquisition boundary area and determined that five river segments met the criteria for wild and scenic river eligibility. These river segments and their immediate environments were determined to be free-flowing and possess at least one Outstandingly Remarkable Value. However, we are not pursuing further study to determine their suitability, or making a recommendation on these river segments at this time because we believe the entire river lengths should be studied (not just those on refuge lands) with full participation and involvement of our Federal, State, local, and non-governmental partners. The results of our Wild and Scenic River inventory are included in appendix D. This management action will provide protection for free-flowing river values, and other river values, pending the completion of future comprehensive inter-jurisdictional eligibility studies.

Conducting Additional NEPA Analysis

NEPA generally requires site-specific analysis and disclosure of impacts in either in an environmental assessment (EA) or in an EIS for all major Federal actions. Other routine activities or general administration are categorically excluded from NEPA requirements to prepare detailed environmental documents.

Most of the major actions in this document are described and analyzed in enough detail to comply with NEPA, and will not require additional environmental analysis. Although this list is not all-inclusive, the following projects fall into that category:

- Opening the refuge to fishing by amending 50 CFR 32.68;
- Implementing changes to the hunt program within the scope of the 2007 hunt plan and EA;
- Creating a Research Natural Area; and
- Enhancing our priority public use programs.

Plans that have already undergone NEPA analysis include the current fire management plan (2004), the current hunt plan (2007) and the furbearer management and trapping plan (2004). Those environmental documents can be requested from refuge headquarters.

We recognize that some of the actions in this plan are not described in enough detail to comply with NEPA, largely because we did not have the necessary information at the time to provide these details. These actions, which will require further NEPA analysis, include:

- Create new trails and trail connections.
- Construct a parking area, platform and interpretive kiosk where A-Frame Rd. enters the refuge.
- Create new boat launch sites.
- Construct an environmental education pavilion on the Beall Trail in the vicinity of the Blackwater River.
- Convert Delta 13/Camp 70 into a road suitable for vehicular access.

We will pursue additional NEPA analysis on these actions once we develop more site-specific details.

Refuge Goals, Objectives and Strategies

Introduction

The following goals, objectives and strategies include an array of management actions that, in our professional judgment, work best towards achieving the refuge's purposes, vision, and goals, and will make an important contribution to conserving Federal trust resources of conservation concern in West Virginia and the central Appalachians. These management actions will most effectively provide low-impact, wildlife-dependent recreation and address the significant issues identified in chapter 2. We believe these management actions will enhance the quality, effectiveness, and sustainability of our management priorities. We also believe these actions are reasonable, feasible, and practical within the 15-year timeframe.

Our management direction as described below is designed to balance the conservation of a mixed forest matrix landscape with the management of early successional habitats and the protection of wetlands for which we believe the refuge can make the most important ecological contribution within the Canaan Valley watershed, Allegheny Highlands and the Refuge System. The habitat types we describe support a wide variety of Federal trust resources, in particular, birds of conservation concern identified in the BCR 28 region, Physiographic Area 12 and wetlands. For each habitat type objective we identify "focal species", whose life and growth requirements will guide management activities in that respective habitat type. Focal species were selected because they are Federal trust resources, identified as priorities in local or regional resource planning documents, or Canaan Valley provides significant habitat for populations of those species. Focal species represent species whose habitat needs, in our opinion, broadly represent the habitat requirements for a majority of other Federal trust species and native wildlife and plants dependent on that respective habitat type. See appendix E for a full description of the process for selecting focal species and priority habitats for the refuge. Our management direction also addresses the Refuge System's mandate to consider managing refuge habitat under the Biological Integrity and Diversity and Environmental Health policy (601 FW 3) (2001).

Under this management direction the refuge will attempt to increase deer harvest by facilitating the removal of more deer from the refuge and by opening more tracts to rifle use. We will officially open the refuge to fishing by amending 50 CFR 32.68, and we will promote fishing opportunities. To facilitate opportunities for wildlife observation and photography we will create trail connections that will offer longer trail routes and that will allow users to travel from the north end of the refuge to the south end, and vice versa, while mostly staying on refuge lands. We will expand the visitor center hours and we will build a new environmental education pavilion. We will also increase the number of environmental education and interpretation programs being offered on and off the refuge. As a result of this increase in infrastructure for visitor services we expect that visitor use will increase by 15 percent.

In this CCP we present a staff of 12.5, which is the recommended number of positions in the 2008 staffing model. Staffing models were developed to answer the following basic question: "What level of staffing is needed to operate and manage a station to achieve the station's purpose, contribute to the mission and goals of the Refuge System, and comply with the Refuge Improvement Act and other laws, regulations, and policy?" Earlier efforts suggest there are 10 functional categories that describe the work we do or need to do on stations in the Refuge System. These are: wildlife and habitat, visitor services, facilities and equipment, maintenance, realty, planning, communications, business

management, information technology, law enforcement, and fire management. The model gives a total number of full time employees needed at a station to do the work, but management must still decide the best mix of disciplines to do that work and whether to deploy part-time, seasonal or permanent employees. To support the expanded biological and visitor services programs in this CCP, we will convert our administrative assistant and park ranger term positions into full time, permanent positions, and we will add a refuge operations specialist position, a permanent seasonal maintenance worker, a permanent park ranger position, and a permanent biological technician.

Map 4-1 illustrates the refuge's predicted habitat management strategies, map 4-2 illustrates the predicted refuge hunt strategies, and map 4-3 illustrates the predicted public use strategies.

GOAL 1

Maintain and perpetuate the ecological integrity of the Canaan Valley wetland complex to ensure a healthy and diverse wetland ecosystem providing a full range of natural processes, community types, and native floral and faunal diversity.

Objective 1.1 (Forested, Shrub and Herbaceous Wetlands and Open Water)

Within 15 years, maintain and improve the biological integrity, diversity and environmental health of the 5,573-acre refuge wetland complex and prioritize management actions to improve an index of ecological integrity by 10 percent, to limit invasive plant infestation to standards established by NatureServe, and to limit excessive deer browse which inhibits natural succession and regeneration. Management will emphasize and reflect the composition, function and diversity of this habitat type as it will occur under natural environmental influences.

Rationale

The refuge currently protects 5,573 acres or 67 percent of all wetland habitats within the Canaan Valley watershed. The wetlands of Canaan Valley represent almost 30 percent of the total wetland acreage in the State (Evans et al. 1982).

As early as 1974, Canaan Valley was officially recognized as a regionally significant wetland area through the designation of 15,400 acres as a NNL, administered by the Park Service. The extensive wetlands and diversity of plant species, particularly plants more typical of northern latitudes, were cited as the primary purposes for the NNL designation (NPS 2000).

In all of the founding documents including the 1979 EIS and 1994 EA, the importance of the wetlands was emphasized as a reason for establishing Canaan Valley refuge:

- "Canaan Valley's wetland and wildlife habitat resources are considered nationally significant." (USFWS 1994b, USFWS 1994c).
- "(Canaan Valley's wetland area)...is listed as a priority for protection in the Service's Regional Wetland Concept Plan, and considered by the State of West Virginia as the most important wetland in the State." (USFWS 1994b, USFWS 1994c)
- "… (Canaan Valley)…contains the largest known freshwater wetland area in the central and southern Appalachians" (NPS 2000).
- "The purpose of the refuge acquisition is to insure the ecological integrity of Canaan Valley and the continued availability of its wetland, botanical, and wildlife resources to the citizens of the United States" (USFWS 1979).

The importance of protecting wetlands in Canaan Valley was further defined through one of the enabling legislative acts, the Emergency Wetlands Resources Act, used to establish the refuge and further detailed in Chapter 1.

Wetland habitats are considered critical components of functioning ecosystems. The State Wildlife Action Plan (2006) notes that wetland habitats harbor up to 23 percent of the State's plant species and that wetlands are one of the State's most critically important habitat types. Because less than one-half of one percent of the State's land area occurs as wetlands, those communities and related species are of high conservation value. Wetland types are also noted as rare community types in the USFS Monongahela Forest Plan (USFS 2006). These facts emphasize the importance of the refuges' role in the State's wetland protection and conservation efforts.

Maintaining and perpetuating the ecological integrity of the wetland complex in Canaan Valley fits well with the Refuge System's Biological Integrity, Diversity, and Environmental Health Policy (601 FW 3). This policy prescribes that refuges maintain and restore, where appropriate, the "biological integrity, diversity, and environmental health" of the Refuge System. It provides refuge managers with an evaluation process to analyze each refuge and recommend the best management direction to prevent further degradation of environmental conditions, and where appropriate and in concert with refuge purposes and System mission, restore lost or severely degraded components. By providing for the full range of natural processes and native floral and faunal diversity, the refuge will be implementing the policy.

The primary known threats to the ecological integrity of the wetland complex in Canaan Valley are past land use practices (including excessive and destructive public use), an unchecked beaver population, an abundant white-tail deer population, invasive and exotic pests, and atmospheric deposition. We developed management strategies to ensure that these specific threats, with the exception of atmospheric deposition, are addressed. To identify, prioritize, and abate the most important of these and other unknown threats to the integrity of the wetland complex, we will develop an index of ecological integrity. Once created, adaptive management actions will strive to improve the index score over the 15 years of this comprehensive plan.

Invasive pest control, hydrologic restoration, and deer abundance reduction are targeted as important management actions prior to the creation of the index of ecological integrity. Invasive plant species such as purple loosestrife, Japanese knotweed, garlic mustard, and Japanese stiltgrass pose imminent threats to the wetland communities. These species have been documented within Canaan Valley or Tucker County, but have limited occurrence on the refuge. By thorough monitoring and rapid control, we will contain their spread to no greater than the thresholds established for individual invasive species by NatureServe, (Faber-Langendoen et al 2008) with emphasis on controlling their encroachment into sensitive or rare plant communities. According to the NatureServe protocol, areas are ranked "excellent" to "poor" based on the percent total abundance (percent of invasive species relative to the native species) of key invasive plant species. A threshold of 3 percent total abundance is cited as "good" and will be applied to invasive plant species such as purple loosestrife or Japanese knotweed which are a particular threat to the refuges' habitats. We will strive to prevent any new occurrences of invasive plants that are already below a 3 percent total abundance threshold, and we will not allow plants to exceed a 3 percent threshold once they are established.

Historical land use practices have altered the hydrologic regime of the wetlands and adjacent slopes draining to the wetlands. Impact reports of past off-road-vehicle (ORV) use in Canaan Valley detail direct loss of vegetation, colonization by non-native plant species and excessive erosion (Stout 1992, USFWS 1993). Railroad grades, roads, and trails impede the flow of surface and subsurface water in some areas, channelize water flow in others, impound water, and accelerate soil erosion and stream sedimentation. Bartgis and Berdine (1991) note that roads and trails divert water from their original drainage patterns in Canaan Valley. This can result in some drainages becoming drier while others accelerate erosion by being forced to carrying more water.

Zeedyk (2002) documented many instances in Canaan Valley where existing roads and trails were channeling water away from historical wetlands and in some cases causing erosion and sedimentation of bog and other wetland communities. These problems have "profoundly if not irreversibly altered" the extent, depths, characteristics, and function of the wetlands on the Main Tract (Zeedyk 2002). Although some of the impacted areas may have stabilized since their disturbance, identifying and remediating the sources of continuing degradation is a high priority in restoring the environmental health of the wetland complex.

Mary Konchar

Whitetail deer

Deer abundance appears to have suppressed woody regeneration in Canaan Valley following logging in the early 1900s and the livestock grazing in the mid- to late-1900s. Observations from deer exclosures in Canaan Valley show a marked increase in number, height, and diversity of woody stems inside the exclosure compared with similar habitat outside the exclosures (USFWS 2006a). Recent observations from a forest inventory study indicate a lack of seedling hardwoods developing in the refuge forest understory. For example only 5 percent of inventoried northern hardwood and cherry forest plots had greater than the necessary number of regenerating stems per plot to be considered to have adequate small advanced reproduction (USFWS 2006a).

Studies of deer herbivory of Jacobs's ladder, a priority conservation plant species (G3-globally vulnerable), show that browse impacts can be significant. Flaherty (2006) found some Jacob's ladder with up to 69 percent of flowering stems browsed on the refuge. Browse rates this high, if continued over many years, could limit natural reproduction and the expansion or even replacement of plants within a population. Deer herbivory, when browse pressure is high, can alter the growth, reproduction and ultimately survival of plants within a specific population (Alverson and Waller 1997, Cote et. al 2004). The browse pressure that the deer population exerts in Canaan Valley may threaten the reproduction and persistence of sensitive plant species and the processes of natural succession and woody encroachment.

Literature suggests that high deer densities impact woody regeneration in central Appalachian hardwood forests. Altered species composition and reduced diversity of woody and herbaceous plant species were found at densities over 20 deer per square mile (deCalesta 1994). Locally, deer were found to impact balsam fir regeneration in Canaan Valley (Michael 1992b). Deer densities based on number of bucks killed per square mile differ and range from 17 to over 30 on refuge lands between 2002 and 2006 (WVDNR, USFWS unpublished data). Surveys conducted in the Timberline Homeowners development by the WVDNR estimated

46 deer per square mile in 2003 and 59 deer per square mile in 2004. Current management of deer in Tucker County targets a density of 25-30 per square mile (Taylor 2009). Refuge observations and forest inventory data suggest that current deer densities are affecting balsam fir survival and impacting forest understory development. Managing the deer population to maintain species diversity and natural processes is an integral component of maintaining the health of the wetland complex.

Strategies:

Within 0-3 years of CCP approval:

- Identify locations where existing railroad grades, road grades, and trails have altered natural hydrologic processes such as surface and sub-surface water flow, evaluate those sites where remediation will benefit the wetland complex, and prioritize these sites for remediation. Methods will include but are not limited to the placement of culverts and permeable fill to restore flow through developed grades and trails, breaching roads, trails and rail grades blocking flow, recontouring and filling deeply incised areas.

- As part of the Habitat Management Plan (HMP) process, develop individual, site specific restoration plans that will maintain and/or improve the integrity of the wetland complex.

Within 3-5 years of CCP approval:

- Remediate, where appropriate, identified impacted areas so that natural processes are restored and soil erosion is reduced. Incorporate prescriptions and implementation strategies in HMP and Annual HMP as appropriate.

- Identify appropriate ecological integrity index metrics that measure both the intrinsic value of the wetland complex as well as the wildlife species that depend on these habitats. Perform initial measurements within palustrine and riparian communities. Facilitate partnerships and research to guide the development of the index and monitoring metrics and improve our knowledge and understanding of the wetland complex.

Within 5-10 years of CCP approval:

- Evaluate effectiveness of the monitoring protocol and integrity index, and determine appropriate time interval for continued long-term monitoring.

Within 10-15 years of CCP approval:

- Continue long term monitoring of integrity index metrics, implementing changes as appropriate to adapt to new information and monitoring results.

Throughout the Life of the CCP:

- Map and evaluate wetland areas impacted by erosion, sedimentation and hydrologic disturbance.

- Minimize all refuge activities that will cause unnecessary disturbance to refuge wetland communities.

- Conduct breeding bird surveys in wetland communities to monitor trends especially for birds of conservation concern.

- Work with partners (universities, colleges, NGOs, and Federal and State agencies) on wetland monitoring and research projects.

- Conduct biannual breeding amphibian call surveys and annual vernal pool monitoring.

- Permit and encourage deer hunting, particularly for does, on refuge land with a goal to maintain a population no greater than the ecological carrying capacity of the landscape. See goal 4, Objective 4.1, for specific strategies on managing the refuge's deer population.
- Work with the WVDNR and surrounding land owners to encourage increased deer harvest, particularly for does, on lands adjacent to the refuge. See goal 4, Objective 4.1, for more details.
- Conduct baseline inventory and monitoring projects in coordination with State and regional wetland inventory and research initiatives. Projects may include amphibian nesting and anuran breeding surveys, and dragonfly inventories.
- Conduct annual deer herd surveys for density estimation.

Objective 1.2 (Forested Wetlands)

Manage and protect 132 acres of wetland conifer forest and woodland to perpetuate their associated flora and fauna, prevent inundation by beaver activity over 10 percent of the land area of these communities for greater than 2 years, and conduct restoration activities where practical to ensure regeneration, natural succession, and persistence of these communities. Benefiting species of concern include balsam fir, Blackburnian warbler, Canada warbler, and Indiana bat.

Rationale

A small portion of refuge wetlands are currently forested with red spruce, eastern hemlock, balsam fir, and associated species, compared to the reports from the late 1800s of the extensive red spruce forests throughout the valley. Recent modeling efforts conducted in collaboration with the multi-agency high elevation conifer work group indicate that Canaan Valley likely supported the greatest extent of wetland conifer forests in the State prior to logging activities. Today 2 percent, or 132 acres, of the refuge wetlands are coniferous forest. Red spruce, balsam fir, and Eastern hemlock are the dominant species in this forest type. Red maple, black ash, serviceberry, black cherry, yellow birch and mountain ash are co-dominants. These forests occur on low lying wetland sections of the refuge's Freeland and Cortland Tracts, along the major riparian corridors such as the Blackwater River through Middle Ridge and in isolated low-lying seep and riparian areas throughout the Main Tract, which is the 9,176-acre tract of land in the northern part of the refuge.

Steve Maslowski/USFWS

American black duck

The spruce-fir swamp communities are rare within the State, region, and worldwide. NatureServe lists the five conifer swamp associations occurring in Canaan Valley as S1-S2 (vulnerable to highly vulnerable to extirpation in the State) and G1-G3 (somewhat to highly vulnerable to extirpation globally). A survey of plant communities in the

Allegheny Mountain Section of the Central Appalachians listed Canaan's conifer swamps as rare because of the limited distribution of wetlands within the region and the presence in Canaan's wetlands of regionally rare plants (Fortney et al. 2005). Community types recognized by the WVCAP associated with these wetlands (floodplain forests and swamps, high Allegheny swamp) are listed as high to very high conservation priorities (WVDNR 2006). For example, balsam fir, a dominant canopy species in nearly 20 acres of forested wetlands, is a State species of concern and is nearing the southern extent of its distribution in Canaan Valley.

The conifer swamps harbor many wildlife species considered by the State as "Species in the Greatest Need of Conservation" and by PIF as priority migratory bird species for BCR 28. These species include Canada warbler, Blackburnian warbler, and mammals such as southern watershrew, bog lemming, Appalachian cottontail, and possibly the Federally endangered Indiana bat (PIF 2003, Rich, T.D. et al. 2004, WVDNR 2006).

The known threats to the conifer swamps are invasive insect pests, invasive exotic plants, an unchecked beaver population, an abundant white-tail deer population, and atmospheric deposition. A narrow ecological niche for balsam fir wetland communities and the restricted range of red spruce and balsam fir to the high elevations in the Central Appalachians also limit the conifer swamps. The threats from and management strategies for invasive plants and deer browse pressure are addressed in Objective 1.1.

Exotic pest control is an important management action to perpetuate the conifer swamp communities. Balsam and hemlock woolly adelgid are immediate and severe threats to the balsam fir and hemlock components, respectively, of the forested wetlands. Since its arrival in Canaan Valley in the mid-1990s, balsam woolly adelgid has infested all balsam stands, resulting in a decline in the number of live balsam firs, killing approximately 30 percent of the mature balsams between 1995 and 2005, and limiting reproduction and regeneration. Because of the limited distribution of balsam fir in the State, apparent complete adelgid infestation of fir throughout the State, and lack of regeneration, management concern for balsam fir communities has increased.

Hemlock woolly adelgid is also an immediate and severe threat to the hemlock component of the forested wetlands. Hemlock woolly adelgid arrived in Canaan Valley in the early 2000s, but appears to be moving slowly through the hemlock population. Little mortality from hemlock woolly adelgid is known from Canaan. No effective treatments for these pests in native, dispersed wetland stands are known. Encouraging the refuge to serve as an experimental control site or using approved biological, chemical, or mechanical control methods for the adelgid helps promote the persistence of two important components of the wetland conifer swamps.

In addition to the impacts of the balsam and hemlock woolly adelgids, deer browsing eliminates many of the naturally regenerating balsam and hemlock seedlings. Reducing deer browse in Canaan Valley helps ensure the regeneration of balsam, hemlock, and their associated forested wetland species. Planting balsam seedlings grown from seeds collected in Canaan Valley and grown in nurseries maintains an important component of the conifer swamp communities and maintains the unique local genotype of this species. Deer exclosures help protect natural and planted seedlings within existing and historical balsam fir stands. Without active management to replace seedling presence, balsam communities will develop into even-aged stands, highly susceptible to adelgid infestation without younger trees to replace them. Many stands on the refuge

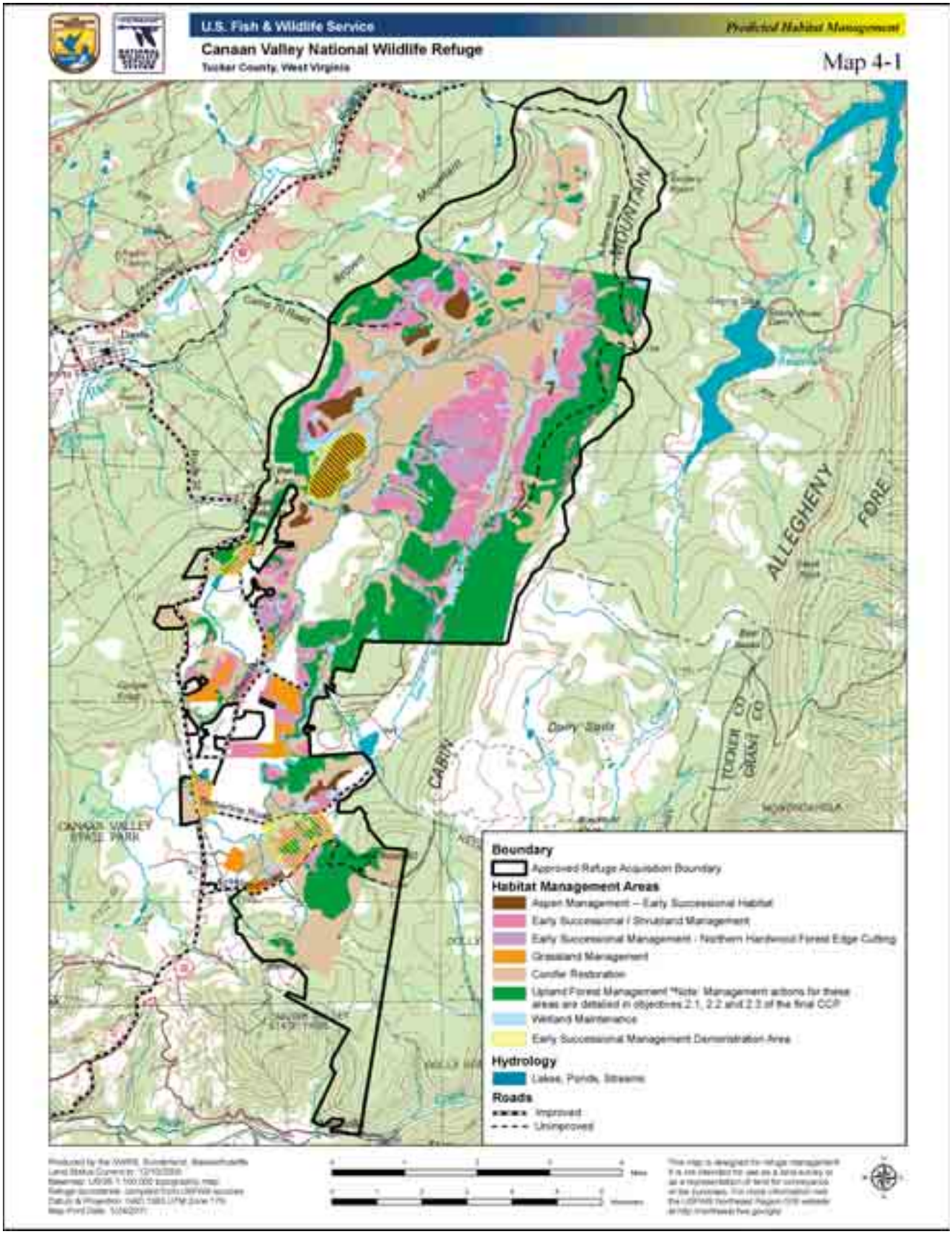
suffering from adelgid infestation have become highly susceptible to wind-throw events. This opens the canopy and permits new seedling growth of typically browse resistant woody species. Without seedling replacement and understory establishment through planting efforts, a dramatic shift in the wetland forested community and loss of the balsam fir component will likely result.

Restoration efforts for areas which are currently forested and areas which were historically forested but have not regrown since the historical logging and fires will be evaluated during the HMP process for management actions. Locations of existing conifer forest will be priority sites for restoration planting to increase the areal extent of and connectivity between patches. Potential restoration sites for conifer forest are identified on Map 4-1 and include both upland and wetland sites. Identified areas on the map generally indicate locations within which the refuge will consider conducting conifer forest restoration management actions. Much of the wetland habitat which was formerly conifer/mixed hardwood swamp forest historically, likely could not support a self sustaining forest at this time. Fires and logging activity followed by years of grazing in some areas have created conditions not suitable for natural tree succession. We will consider site suitability, ecological context and practicality measures while making the decision for locations of restoration actions.

Beaver activity and the flooding of low lying areas is a natural and important disturbance process in Canaan Valley. The natural landscape mosaic of flooded areas and old ponds in various stages of succession maintains a diversity of plant communities unique to Canaan Valley and provides niches for several uncommon plant species. With few natural predators, however, the beaver population threatens sensitive plant communities with prolonged inundation. Bottomland forested communities, especially balsam fir stands, are particularly vulnerable due to their limited distribution and have experienced a 40 percent reduction in area between 1975 and 1997 (Fortney and Rentch 2003). Limited and regulated trapping of beaver ensures the protection of targeted wetland plant communities and species of concern (Bonner 2005). The refuge initiated a beaver management program through the development of a furbearer management plan

Ken Sturm/USFWS

Tree chewed by beaver


U.S. Fish & Wildlife Service
Predicted Habitat Management
Canaan Valley National Wildlife Refuge
Tucker County, West Virginia
Map 4-1
Boundary
Approved Refuge Acquisition Boundary
Habitat Management Areas
Aspen Management – Early Successional Habitat
Early Successional / Shrubland Management
Early Successional Management - Northern Hardwood Forest Edge Cutting
Grassland Management
Conifer Restoration
Upland Forest Management *Note: Management actions for these areas are detailed in objectives 2.1, 2.2 and 2.3 of the final CCP
Wetland Maintenance
Early Successional Management Demonstration Area
Hydrology
Lakes, Ponds, Streams
Roads
Improved
Unimproved
CANAAN VALLEY STATE PARK
ALLEGHENY MOUNTAIN
FORE
CABIN
Dolly Sods
TUCKER CO
GRANT CO

and environmental assessment, approved in 2003. Beaver management is aimed at reducing the threat of inundation of rare plant communities by proactively trapping through a special use permit issued by the refuge.

Balsam fir is singled out in this objective as a species of concern because of its rarity in the State (it is on the southern edge of its distribution), and because of the diversity of threats impacting the population's persistence in Canaan Valley. Balsam woolly adelgid causes mortality of mature trees, limiting reproduction and regeneration. Deer browsing eliminates many of the naturally regenerating balsam seedlings. Perpetuating this species in Canaan Valley protects an important component of the most vulnerable conifer swamp communities and maintains the unique local genotype of this species. Current partnerships have successfully funded the collection and propagation of local balsam fir stock for restoration purposes on the refuge through a combination of volunteer support, staff time, grants, and limited station funds. Restoration work to conserve balsam fir as a species and as part of a rare plant community will continue to be an emphasis on refuge lands. Future restoration work may require additional funding emphasis from the refuge if balsam fir resumes a precipitous decline as was seen in the early 2000's.

The Indiana bat is a Federally listed endangered species and a trust resource of the Service. Primary foraging habitats include wetland and riparian areas, bottomland forests and edge habitats. Roost trees are typically in wooded wetlands, bottomland and floodplain forests, as well as upland habitats. Habitat loss and degradation, overutilization for scientific purposes, disease and predation, environmental contaminants, and the inadequacy of existing regulatory mechanisms for summer habitat threaten the population viability of the Indiana bat across its range. The Indiana Bat Draft Recovery Plan (USFWS 2007a) calls for the conservation and management of hibernacula and adjacent lands, summer habitat, and winter populations, for the monitoring of populations on Federal lands, and for the development of public outreach and information programs (Recovery Actions 1, 2, and 4). If Indiana bats are using the refuge for foraging and roosting, then protecting, maintaining, and improving habitat quality on the refuge will contribute to the viability of the species and its recovery. The conservation of this endangered species is now more important than ever as white nose syndrome spreads across the range of the Indiana bat.

Acoustical recordings from 2003, 2006, 2007, and 2008 suggest Indiana bats are using riparian corridors and beaver ponds on the refuge for summer foraging habitat. Mist-netting will provide visual confirmation of their presence, reproductive information, the types of refuge habitats used, and the seasons they are using the refuge habitats. Summer use indicates a potential for maternity colonies to be located on or near the refuge. As a key stage in the life cycle of the species, it is imperative to know the location of maternity colonies and protect them from disturbance. Radio telemetry of lactating or recently lactating female bats found on the refuge will define the habitats and locations that are important for this endangered species.

Gathering more information about use of the refuge by this endangered species will allow more informed management decisions and ensure the protection and improvement of habitats used as roost or maternity colonies.

Strategies:
Within 0-3 years of CCP approval:
- Identify, map, and prioritize communities and locations where no more than 10 percent loss of forested wetland plant communities from inundation by beaver activity will be tolerated.

- Survey for Indiana bat presence and habitat use using mist nets and acoustic monitoring equipment along 90 percent of riparian and wetland communities and determine appropriate conservation and management actions.

- Contact agency partners and other organizations to find training to develop expertise within refuge biological staff to operate acoustical monitoring devices, conduct mist net surveys, correctly identify bat species by sound and sight, and receive the appropriate permits for handling the species.

- Determine summer roosting and foraging locations in Canaan Valley using radio telemetry of Indiana bats captured in mist nets.

Within 5-10 years of CCP approval:

- Assess the quality and extent of any occupied Indiana bat habitat and implement forest management techniques to improve the quality of at least 20 percent of potential habitat. This may include creating areas of standing dead hardwood trees near wetland and riparian habitat by selective girdling operations.

Throughout the Life of the CCP

- Work with volunteers to support bi-annual spruce and fir planting projects in wetland and riparian communities.

- Support cone collecting and seed extraction of conifer species through volunteer support.

- Partner with the U.S. Department of Agriculture (USDA) NRCS (Alderson, WV) to store and propagate conifers for restoration purposes.

- Focus planting on habitats currently supporting small aggregations of spruce and fir.

- Support conifer planting efforts through grant funding with minimal use of station funds.

- Work with university partners and other researchers to evaluate spruce restoration techniques and prioritize locations for restoration activities.

- Participate in the multi-agency Red Spruce MOU.

- Maintain and monitor balsam fir exclosures to evaluate impacts of deer browse on balsam fir reproduction, growth and the success of associated wetland plant species.

- Conduct beaver pond use and development surveys focused in high priority locations to determine potential of community loss through beaver activity.

- Issue special use permits for people to trap beaver in order to prevent prolonged inundation of high priority locations as directed by refuge staff. Beaver trapping will be strictly a management action tied directly to the protection of rare plant communities and refuge infrastructure as outlined in the furbearer management plan.

- Perpetuate conifer wetland forest by working with partners to propagate and plant Canaan Valley balsam fir and red spruce within the extent of current and historical ranges.

- Work with partners to evaluate and implement methods for controlling balsam woolly adelgid.

- Construct deer exclosures when necessary to protect balsam seedlings from deer browsing.

Objective 1.3: (Shrub and Herbaceous Wetlands)

Manage and protect 5,060 acres of wet shrublands and herbaceous wetlands to perpetuate their associated flora and fauna, prevent inundation by beaver activity over 10 percent of the land area of these communities for greater than 2 years, and conduct restoration activities where practical to ensure regeneration, natural succession, and persistence of these communities. Benefiting species of concern include alder flycatcher, American woodcock, pink-edged sulfur butterfly and many herbaceous wetland plant species.

Rationale
Like the forested wetlands discussed in Objective 1.2, the shrub and herbaceous wetlands are both maintained over time by and susceptible to inundation by beaver activity. Beaver activity and the flooding of low lying areas is a natural and important disturbance process in Canaan Valley. The natural landscape mosaic of flooded areas and old ponds in various stages of succession maintains a diversity of plant communities unique to Canaan Valley and provides niches for several uncommon plant species. With few natural predators, however, the beaver population threatens sensitive plant communities with prolonged inundation. Limited and regulated trapping of beaver ensures the protection of targeted wetland plant communities and species of concern (Bonner 2005).

See also rationale for Objective 1.2.

Strategies:
Within 0-3 years of CCP approval:
- Identify, map, and prioritize communities and locations where no more than 10 percent loss of shrub/herbaceous wetlands from inundation by beaver activity will be tolerated.

- Conduct bimonthly acoustical monitoring surveys (May-September) along streams and beaver ponds to detect presence of Indiana bats.

Throughout the Life of the CCP
- Map and evaluate wetland areas impacted by erosion, sedimentation and hydrologic disturbance.

- Minimize all refuge activities that will cause unnecessary disturbance to refuge wetland communities.

- Conduct breeding bird surveys in wetland communities to monitor trends especially for birds of conservation concern.

- Work with partners (universities, colleges, NGOs, and Federal and State agencies) on wetland monitoring and research projects.

- Conduct biannual breeding amphibian call surveys and annual vernal pool monitoring.

- Plant alder seedlings to increase patch size and management capability of alder/tall wetland shrub habitat.

Objective 1.4: (Open Water/Aquatic)

Manage and protect 55 miles of stream and a dynamic beaver pond system (currently 85 acres) for cold water fish species and breeding and foraging migratory birds by ensuring adequate riparian cover, limiting anthropogenic disturbance, and allowing the process of beaver pond formation and succession to occur naturally. Benefiting species include brook trout, redside dace, American black duck, American bittern, wood duck, and southern water shrew.

Rationale
Streams, rivers, beaver ponds, and other open water bodies in Canaan Valley provide habitat for species of concern such as brook trout, redside dace, black ducks, wood ducks, and American bitterns. High quality wetland and cold water riparian habitat is scarce and frequently degraded in the State and in the High Allegheny Plateau region of the Central Appalachians. Degraded riparian habitat in West Virginia is noted to be the second greatest environmental stressor in the State and within the Mid-Atlantic highlands overall. West Virginia has a low percentage of wetland acres and has lost an estimated 24-57 percent of historical wetland communities from development and alteration (WVDNR 2006). Wetlands are considered uncommon and are noted as extremely important for wetland dependant plant and wildlife communities (WVDNR 2006, Tiner 1996). As the largest wetland in the State with the headwater tributaries to the Blackwater River, Canaan Valley is an important resource for maintaining open water-dependent species.

Brook trout are an indicator species for the quality of the cold water fisheries in the region. Although once abundant, channelizing and impounding of streams, logging that removed shade and cover from streamsides, soil erosion, sedimentation, acid mine drainage, and competition from non-native fish has led to the extirpation of brook trout in 25 percent of the streams in its historical range in West Virginia. The remaining population is classified as "Greatly Reduced" with 85 percent of brook trout existing in highly fragmented populations lacking connectivity to other suitable or occupied stream segments (Hudy et al. 2005). Redside dace, a species with similar habitat requirements that is rare in the State, likely faces similar reductions in population size and connectivity as a result of habitat fragmentation and degradation. This species was reportedly common in Canaan Valley in the 1940s and 1950s but is currently rare with documented population declines since 1978 (Cincotta et. al 2002).

The refuge was established in part to protect the valley's cold water habitats and their associated ecological systems. One of the founding authorities (Emergency Wetlands Resources Act of 1986, 16 U.S.C. 3901-3932), the final EIS (USFWS 1979), and final EA (USFWS 1994a) for the establishment of the refuge, point to the conservation of wetlands, protection of water quality, and preservation of cold water fisheries as a primary focus for refuge management. The continued degradation of habitat in the region and subsequent fragmentation of the brook trout populations warrants an ongoing focus in refuge management for protecting cold water habitats. The Service, Eastern Brook Trout Joint Venture, and the WVDNR recognize the importance of this focus and similarly emphasize the protection, restoration, and maintenance for populations and habitats of brook trout and other aquatic species of concern (Moss et al. 2007, EBTJV 2007, and WVDNR 2006).

There are eight tributaries either entirely or partially on the refuge which have current or historical records for brook trout. Those streams or sections of stream outside of refuge boundaries can be focus areas for joint habitat management projects to protect water quality and the riparian corridor. Areas on the refuge which have historical records for brook trout should be evaluated for water quality and the associated riparian forest cover for possible management actions.

Increasing forest cover of riparian corridors protects water quality for aquatic species such as brook trout and redside dace by shading streams (slowing heat gain), reducing sedimentation, and providing woody debris for habitat structure. A 100 meter forested or tall shrubland buffer on each side of perennial, intermittent, and ephemeral streams exceeds the West Virginia DEP's recommended 30 meter buffer for erosion control and sedimentation and provides

the shading, stabilization, and woody debris inputs that benefit cold water fish habitat (WVDOF 2001, EBTJV 2005). A forested buffer, when greater than 90 percent canopy closure and at least 25m wide on each side of the stream, allows the stream to retain normal stream temperature behavior with minimal daily and seasonal temperature fluctuations (Wilkerson et al. 2005). Wider riparian forest corridor widths support greater numbers of breeding birds, especially those considered area-sensitive species (Peak and Thompson 2006, Fischer 2000). Using the 100 meter width will ensure that riparian corridors protect aquatic habitats and improve migratory bird habitat. Limiting gaps in canopy cover along a stream to less than 100 meters allows the stream to recover to near normal temperature behavior if the stream subsequently flows through closed canopy forest (Wilkerson et al. 2005).

Sedimentation of streams from upland soil erosion and disturbance inhibits the development of brook trout eggs and reduces reproductive success. Small amounts (<1 percent) of fine sediment (<0.063mm) in the spawning bed substrate can negatively impact brook trout recruitment in Appalachian headwater streams (Hartman and Hakala 2006). Rehabilitating the extensive logging roads, skid trails, railroad grades, and currently degraded streams can decrease sedimentation and allow for greater reproductive success and potential new restored habitat for brook trout and redside dace. The restoration of degraded wetland and upland areas is addressed in Objective 1.1.

Improving riparian forest cover also provides habitat for a diversity of other wildlife species including migratory birds, amphibians, and mammals. Studies indicate that increasing riparian area increases avian species richness (Stauffer and Best 1980; Triquet, McPeek, and McComb 1990; Keller, Robbins and Hatfield 1993; Kilgo et al. 1998) and that narrow buffer zones are less likely to contribute to high water quality goals (Houlahan and Findlay 2004). Semlitsch (1998) recommended riparian buffer strips greater than 165 meters to maintain viable populations and communities of Ambysomatid (mole) salamanders and to maintain the connection between wetlands and terrestrial habitats to preserve the biodiversity of remaining wetlands. The range of recommended widths of riparian habitat for birds is broad. Fischer and Fischenich (2000) cite recommendations that range from 15 meters for stopover use during migration, to 100 meters to maintain nesting habitat for area sensitive species of birds. Kilgo et al. (1998) recommended the width of bottomland hardwood forest to be at least 500 meters to maintain a complete avian community.

American black ducks, American bitterns, wood ducks, and other waterfowl use the headwater wetlands and impounded water of beaver ponds in Canaan Valley during migration and the breeding season. The scarcity of suitable habitat within the State and range-wide population declines places black ducks and bitterns on the State species of concern list. Wetland habitats are noted as a high conservation priority in the WVCAP and provide habitat for a large number of species listed as State conservation priorities. As the largest wetland in the State harboring these sensitive species, the refuge can play an important role in the protection and management of naturally functioning open water wetland habitats. Open water habitat is relatively rare and isolated in the valley, being formed by beaver activity and to a lesser extent historical railroad and road grades impounding water flow. Acreage of pond habitat changes over time as beaver populations fluctuate.

In addition to the primary refuge purpose directing wetland conservation (Emergency Wetlands Resources Act of 1986, 16 U.S.C. 3901-3932), the final EA (USFWS 1994a) prepared prior to land acquisition lists as an objective providing and developing habitat for waterfowl consistent with preservation of existing ecosystems. Protecting the streams and the open water habitat created by beaver

Ken Sturm/USFWS

Glade Run wetlands

ponds for breeding and migratory waterfowl on the refuge continues to be a high priority, as it provides habitat otherwise scarce in the region. Actively creating impoundments to further maximize species productivity, however, is precluded by the importance of protecting the unique wetland system that is maintained by the naturally occurring and succeeding beaver ponds. The formation of new beaver ponds, desirable for the creation of waterbird habitat, may directly conflict with other priorities of the refuge and the persistence of sensitive plant communities. The protection of rare plant communities (forested wetlands) from beaver pond inundation is addressed in Objective 1.2.

Protecting open water habitats is important for the variety of wildlife and plant communities that rely on these limited habitats on the refuge. Disturbance and harassment of breeding waterbirds can be an important stressor affecting their foraging behavior and reproductive success. Due to the limited quantity of pond habitat on the refuge, these areas could have a disproportional amount of disturbance associated with fishing or other recreational activities.

Disturbance to waterfowl from recreational fishing access is of particular concern because fishing is permitted year-round in West Virginia. Humans walking off-trail have been shown to cause greater disturbance (greater area of influence, flush distance and distance moved) to wildlife than walking within trail corridors (Miller et al. 2001). Predictability of disturbance (on trail vs. off trail) has been cited as a major factor in impacts to wildlife. Walking off trail is considered less predictable to wildlife and typically more disruptive (Trails and Wildlife Task Force 1998, Miller et al. 2001, Knight and Cole 1991). Requiring anglers to use designated public use trails to access fishing areas will help limit this type of disturbance. Nonetheless, once anglers access pond habitats, disturbance of wildlife associated with those sites is likely.

The strategies listed below will help the refuge achieve its objective of providing suitable open water and aquatic habitat with minimal disturbance to support and enhance the population viability of black ducks, bitterns, and other waterfowl species as well as protecting other wildlife species associated with aquatic habitats on the refuge.

Strategies:
Within 0-3 years of CCP approval:

- Survey stream and river segments to document locations of existing populations of brook trout and redside dace. We will focus on these areas for riparian corridor restoration.

- Identify riparian corridors and springs with less than 90 percent forest cover within a 100 meter and 500 meter buffer of the stream or spring. Prioritize locations for reestablishing forest within 100 meters of the stream and improving forest cover within 500 meters of the stream, with highest priority given to stream reaches with less than 50 percent forest cover for greater than 100m along the stream.

- Identify effective management techniques for enhancing brook trout populations and develop a management plan for implementing the strategies. Strategies may include stocking native (local genotype) brook trout, removing brown trout from headwater tributaries and seeps, and in-stream habitat restoration.

Within 3-5 years of CCP approval:

- Begin riparian restoration to increase canopy cover and corridor width by planting native tree and tall shrub species, using local seed source when possible, and allowing the regeneration through natural succession of woody species.
- Evaluate need and feasibility of translocating redside dace from elsewhere in the State to suitable locations within the refuge, and if translocation is deemed feasible, establish timeline for reintroduction
- Implement cold water fisheries restoration plan.

Throughout the Life of the CCP

- Work with WVDNR and other partners to support inventories of cold water habitat to document persistence of native brook trout and redside dace.
- Use the framework provided in the Interagency Status Report on the Fisheries Resources of the Upper Blackwater River in West Virginia (Moss et al. 2007) to plan future management actions on stream and river habitats.
- Protect from disturbance isolated beaver ponds and river habitats that support nesting, feeding and roosting areas for migratory birds by allowing public access only from approved public use trails where they intersect stream or corridors or pond habitat.
- Allow the dynamic nature of beaver pond formation and evolution where bottomland forested and rare plant communities are not threatened.
- Inventory and monitor priority wildlife and plant species in this habitat type.
- Conduct acoustical monitoring to detect foraging locations of Indiana bats during breeding and migration seasons.
- Conduct priority wildlife monitoring activities to track wildlife population trends associated with aquatic resources.
- Work with partners and adjacent land owners to improve riparian cover within the Canaan Valley watershed.

Objective 1.5: (Research Natural Area)

Establish a Research Natural Area (RNA) to participate in the national effort to preserve examples of major wetland ecosystem types; to provide research and educational opportunities for scientists and others in the observation, study, and monitoring of the environment; and to contribute to the national effort to preserve a full range of genetic and behavioral diversity for native plants and animals.

Rationale

RNAs exist to fulfill three objectives, outlined in the Refuge Manual (8 RM 10) as follows: first, to participate in the national effort to preserve adequate examples of all major ecosystem types or other outstanding physical or biological phenomena; second, to provide research and educational opportunities for scientists and others in the observation, study, and monitoring of the environment; and third, to contribute to the national effort to preserve a full range of genetic and behavioral diversity for native plants and animals, including endangered or threatened species.

Federal land management agencies have developed a national system of RNAs since 1927. The RNA designation is an administrative designation to establish areas on which natural features and processes are preserved with minimal human intervention for research and education purposes. The established refuge policies

(8 RM 10) provide the only protection for these areas and there are no separate Federal regulations which apply.

In this management action we will designate a portion of the refuge's central wetland complex to be included in the Research Natural Areas system. The area under consideration is the core wetland complex and consists of several different distinct community types including palustrine marsh, beaver influenced wetlands, wetland shrub swamp and peatland. Although much of the wetland on the refuge falls into these general plant community categories, this central wetland area was chosen for nomination due to its size, contiguous habitat and the ability to delineate boundaries mostly based on natural features and topography. For the purposes of this discussion we will call this area the Blackwater Research Natural Area (BRNA).

The BRNA will consist of 754 acres and will be bounded generally by the western edge of the wetland complex along the Blackwater River to the south and west, Middle Ridge to the East and a portion of Glade Run to the north. It is approximately 97 percent wetland and 3 percent upland habitat. Plant communities within the BRNA include: 227 acres of herbaceous wetland, 470 acres of shrub wetland and 8 acres of open water/aquatic habitat. A limited number of upland habitat type acres are included in the BRNA for practical purposes. These acres are physically located within the larger wetland complex and they contribute to making the BRNA a more manageable unit.

Of the wetland types, the shrub wetland communities are broken out to include 277 acres of blueberry, 108 acres of St John's wort, four acres of speckled alder, 58 acres of viburnum, 23 acres of black chokeberry, and one acre of spirea tall shrub thicket. Most of the shrubland habitat exists as either narrow bands (alder) or scattered shrubs within a saturated moss-dominated or emergent wetland. Therefore the habitat suitability for hunted species such as American woodcock is low and the designation will have little effect on the hunter opportunity for game species.

RNAs may be categorized according to biological and physical features, management criteria and classification systems. The BRNA supports many of the qualifications for biological features. As a component of the largest wetland complex in the State of West Virginia as well as containing the largest contiguous peatland and shrub swamp plant communities, it meets the criteria of an ecological community that illustrates characteristics of a physiographic province or biome. The BRNA exhibits a prime example of high elevation/Central Appalachian wetland plant communities.

The cool, moist climate of the valley has maintained favorable growing conditions for northern plant species following the last glaciation. Balsam fir represents one of 109 plant species that have distinctly northern ranges but are able to persist in the valley. Twenty-three of these species and varieties have been reported from five or fewer locations in West Virginia. The area is mixed with northern-affiliated plant species as well as several species considered endemic to the Central Appalachians and some southern high elevation species reaching their northern-most extent. Botanists have recorded 73 State species of concern in Canaan Valley. Twenty-eight species are listed as critically imperiled (S1) by the WVDNR Natural Heritage Program. NatureServe and the network of Natural Heritage programs rank four species (Appalachian blue violet, glade spurge, Appalachian oak fern, and Jacob's ladder) as globally vulnerable (G3). These facts meet the biological criteria established for RNAs including allowing relic flora to persist from earlier periods, and a habitat which supports a vanishing, rare or restricted species.

Much of the area under consideration was subject to community altering disturbances from the late 1800s through the late 1990s. Logging, fires, grazing and unrestricted off-road vehicle use caused great impacts to the wetland complex of the planned BRNA. However, following refuge acquisition and protection, much of the wetland plant communities have begun the slow process of natural restoration and succession. Because of this area's disruptive past and subsequent protection, the BRNA meets the criteria for an ecological community significantly illustrating the process of succession and restoration.

The proposal to designate the BRNA is consistent with the establishing legislation for the Canaan Valley refuge, as detailed in the Emergency Wetland Protection Act (1986). Establishing the core wetland complex as an RNA will elevate the significance of the area for research and educational opportunities supported by the refuge and identified in founding documents (USFWS 1979, USFWS 1994a). The establishment of the BRNA will help fulfill a stated purpose of the refuge by "insuring the ecological integrity of Canaan Valley and the continued availability of its wetland, botanical, and wildlife resources to the citizens of the United States" (USFWS 1979). Additionally the Station Management Plan (USFWS 1994c) notes that "Canaan Valley is by far the largest of the relict boreal ecosystems found in the high elevations of the central and southern Appalachian Mountains…Canaan Valley presents an outstanding scientific opportunity by virtue of its size, diversity and central location for the establishment of a research/ educational center for study of these unique ecosystems." The BRNA will be used to fulfill the development of wetland ecological integrity indices and serve as a reference area. It will be promoted widely to explore long term research and monitoring of climate change, wetland succession and other aspects of wetland ecology and biology. The establishment of the BRNA will help achieve the goals stated in these founding documents for the refuge.

Upon designation a site specific natural area management plan will be written for the BRNA, concurrent with the refuge HMP. The RNA plan will detail use objectives and restrictions, management objectives and maintenance details, and protection objectives and practices. Generally we expect the BRNA to meet all the objectives outlined in the Refuge Manual for protection, access, structures and management. There are possible hydrologic restoration actions which could occur within the planned BRNA, however these will require temporary actions aimed at preventing degradation of the wetland and will therefore not violate the objectives for management of RNAs.

The Refuge Manual states that a RNA "must be reasonably protected from any influence that could alter or disrupt the characteristic phenomena for which the area was established." Therefore, if predator removal or other disruption of the community processes has created conditions under which certain species multiply beyond normal limits and pose a disruptive threat, especially to vegetation, refuge management can include controlling these populations. For this reason we will continue to permit hunting for white-tailed deer and beaver trapping as population management tools. High deer densities have impacted natural regeneration, succession and likely distribution and abundance of plant species and communities in Canaan Valley. Allowing deer hunting within the BRNA will be required to fulfill the objectives for which the RNA will be established, in other words, to protect the wetland plant communities and provide exemplary opportunities for research and education. Allowing beaver trapping also fulfills the objectives for which the RNA will be established by protecting plant communities, especially the bottomland forest communities. Other consumptive and non-consumptive recreation will be restricted as is consistent with RNA guidance in the Service Refuge Manual (8RM10).

Strategies
In addition to strategies mentioned in Objective 1.1 (where appropriate relative to the management policy for RNAs)

Within 0-3 years of CCP approval:
- Complete a site specific management plan for the Blackwater Research Natural Area.
- Post boundaries as consistent with RNA policy (8RM10).

Throughout the Life of the CCP
- Conduct outreach to research agencies and institutions to develop an active program for wetland related research activities within the BRNA.
- Permit deer hunting as outlined in the refuge Hunt Plan and EA.
- Permit beaver trapping as outlined in the Furbearer Plan.
- Use the BRNA as a focal area in which to conduct monitoring for wetland ecological integrity.

GOAL 2

Perpetuate the ecological integrity of upland northern hardwood and northern hardwood-conifer forests to sustain native wildlife and plant communities, including species of conservation concern, for the development of late-successional forest characteristics, and to perpetuate the biological diversity and integrity of upland forest ecosystem.

Objective 2.1: (Northern Hardwood Forest)

Restore the 5,273 acres of northern hardwood forest to an unfragmented condition within and between refuge and adjacent lands (canopy cover greater than 80 percent, forest patches with a minimum distance of 600 m to non-forest edges, and maximum extent of forest acres) to maximize nesting and foraging habitat for forest interior migratory bird and other species of conservation concern. Benefiting species include scarlet tanager, black-throated blue warbler, worm-eating warbler, Eastern wood peewee, black bear, bobcat, and fisher.

Rationale
In this management action, we are proposing to maximize contiguous forest patches, with a target of greater than 7,400 acres. Important from a regional perspective; many migratory birds reach their abundance peaks in this region of the Central Appalachians. Managing and protecting contiguous forest will provide habitat for several species listed by the State as "species in the greatest need of conservation" including black-billed cuckoo, Cooper's hawk and southern pygmy shrew (WVDNR 2006). Refuge forests provide breeding habitat for PIF Area 12 priority species such as scarlet tanager and Eastern wood pewee. Additionally many migrating birds which are also species of conservation concern in the Eastern and Northern Biomes utilize the refuge's forested habitats. Examples include black-throated blue and Blackburnian warbler, both species of conservation concern in PIF BCR12 (part of the Northern Forest Biome) that comprised 17 percent of all landbird captures between 1958 and 2006 at the Allegheny Front Migration Observatory; five miles east of the refuge boundary (Rich, T.D. et al. 2004, Bell, R.K. 2006).

A block of forest at least 7,400 acres increases the probability of occurrence for several area-sensitive species and provides for the most sensitive species such as the black-throated blue warbler and scarlet tanager (Robbins et al. 1989; Betts et al. 2006). Reducing edge effects will improve and increase area-sensitive bird nesting habitat in refuge upland forests. Predation of bird nests decreases with

Steve Maslowski/USFWS

Scarlet tanager

increasing distance from the forest edge and has been documented to reach a minimum occurrence at 600 meters or greater from a forest edge (Wilcove 1985, Noss and Cooperrider 1994). As a surrogate for the distance from the edge at which forest interior is no longer affected by forest edge, forest patches will be maintained with a minimum radius of 600 meters to ensure high quality forest interior habitat. For this reason the refuge will strive to reduce fragmentation and prevent edge effects within a 600 meter radius of forest blocks.

The refuge will manage 5,273 acres of the current 6,400 acres of northern hardwood forest for area sensitive species. While this is less than the minimum target patch size for these species, approximately one-third of this forest is contiguous with forested areas of public and private lands and therefore contributes to this goal with the surrounding forest at a landscape scale. Future acquisitions have the potential to bring refuge forest ownership to the 7,400 acre target.

Achieving the minimum target patch size requires working with adjacent landowners and converting some early successional habitats to forest cover. Areas of early successional habitat that currently fragment forested habitat will be the focus for habitat conversion and will be detailed in the Habitat Management Plan. Partnerships to manage adjoining forest patches as contiguous forest with the refuge will increase the effective size of the upland forest in the Canaan Valley area. Continuity with adjacent forested habitat is important to allow movement corridors between other forested landscapes, particularly for area sensitive forest birds and far ranging mammal species. Larger forest blocks on a landscape level will help create resistance and resiliency to possible effects of climate change allowing the refuge to play a larger role in forest conservation in West Virginia.

Refuge forest habitat will be managed to maintain and improve existing forest habitat to attain the largest acreage forest patch while attempting to minimize the perimeter to area ratio and reduce irregularly shaped forest patches. Focusing on enlarging narrow forest segments and connecting core areas can increase population sizes of interior forest species and reduce the populations of edge species, which includes invasive species, in the core habitat area (Ewers and Didham 2007). Maintaining and improving the quality of forested habitat and reducing forest fragmentation on refuge property will aid in the conservation of wildlife tied to this habitat on adjacent lands and provide a link between forests on Cabin, Canaan, and Brown mountains to valley habitats in lower elevations.

Logging of large tracts just prior to refuge acquisition in 2002 left sparse, and in some cases, less than 20 percent forest canopy cover (USFWS 2006a). This canopy cover is deficient when compared with old growth northern hardwood and beech-maple-basswood forests which ranges in cover from 75 to 97 percent (Tyrrell et al. 1998). Ensuring that the refuge forest cover is at least 70-80 percent provides continuity of habitat for interior forest-dependent species (DeGraaf et al. 1992). The past logging activities have also created a forest fragmented by

logging roads and clearings (former pastures). Many studies have documented the biotic and abiotic changes relative to forest removal and edge creation within forested habitats (Davies-Colley et al. 2000, Marsh and Beckman 2004, Franklin and Forman 1987). Due to the large number of existing logging roads and recently logged forest on refuge lands, these biotic and abiotic effects could be negatively impacting a variety of terrestrial wildlife species, including amphibian populations.

Old logging roads and clearings create narrow corridors of forest fragmentation throughout the core areas of refuge forested habitat, increasing the likelihood of incursion by non-native species into the forest and impacting breeding habitat for forest interior migratory birds (Watkins et al. 2003). Fragmentation as a result of road construction can decrease soil moisture and humidity, increase average soil temperatures and increase wind penetration as well as affect the predation and competition rates among forest dwelling species (Marsh and Beckman 2004). Salamander species such as red backed salamanders are known to be tolerant of disturbance and less sensitive to landscape scale disturbances such as logging road fragmentation (Gibbs 1998).

Logging roads may also affect the predator density within a forested ecosystem. Current research is being conducted to evaluate the effect logging roads have on predators (snakes) in areas adjacent to occupied Cheat Mountain salamander habitat. Preliminary results from the refuge found no live snakes on Powderline ski trail (an old logging road) as compared to 69 at a Dolly Sods study site and 31 at a Timberline resort study site (Bradshaw 2010). Results and recommendations from this study will be used to guide refuge decisions on management options for logging roads and trails on refuge land.

Restoration of old roads and skid trails will help reduce edge effects throughout the refuge's upland forested habitat. Allowing old roads to regrow or actively restoring roads and clearings on the refuge can help prevent the spread of exotic plants to the interior forested landscape, reduce erosion, and protect aquatic resources (Watkins et al. 2003, Switalski et al. 2004). Improving continuity of habitat and reducing potential of invasive species spread will improve the biological integrity of this habitat. The refuge's northern hardwood forest also serves as an important connection to the high elevation wetlands and headwater tributaries of the valley, and harbors unique forested seep communities.

Strategies:

Within 0-3 years of CCP approval:

- Identify and map forest patch sizes (inclusive of adjacent public and protected lands); locations of fragmentation including logging roads; percent canopy cover; and locations with less than a 600-meter radius, and prioritize locations for restoration.

- Identify local seedling source, and if needed, propagate local genotypes of forest species, to provide sufficient stock for replanting forest gaps.

- Identify and map logging roads where natural forest regeneration is being suppressed by exotic vegetation, soil compaction or other reasons.

Within 5-10 years of CCP approval:

- Plant tree seedlings to reduce the number of fragmented forest gaps by 50 percent.

- Obliterate, re-contour, and revegetate old logging roads identified as high priority sites for restoration.

Within 10-15 years of CCP approval:

- Conduct restoration actions to encourage forested habitat regeneration, which will reduce logging road fragmentation. Methods include but are not limited to planting logging roads with native tree and shrub species and road obliteration/ re-contouring with heavy equipment.

Throughout the Life of the CCP:

- Work with partners to evaluate management options for promoting mature forest characteristics, forest species diversity, and understory development.
- Conduct breeding bird surveys in forest communities to monitor trends especially for birds of conservation concern.
- Protect the core spruce-dominated forests from disturbance, fragmentation, or invasive species infestation.
- Work with partners to experiment with methods to achieve late-successional characteristics.
- Allow forest succession to proceed to reforest recently logged areas such as Middle Ridge by reducing deer browse pressure and by planting with spruce and hardwood seedlings.
- Conduct priority wildlife monitoring activities to track changes in focal species and WVCAP priorities over time as a result of management actions.

Objective 2.2: (Northern Hardwood Forest Understory)

Restore structural and compositional diversity in the hardwood forest understory and mid-story (1-12 cm dbh size class) to provide nesting and foraging habitat for species of conservation concern such as black-throated blue and Canada warblers and maximize the persistence of herbaceous plant populations such as glade spurge and forest seep communities. Target structure and composition includes increasing the mid-story stem density, mid-story diversity index, and cover and diversity of herbaceous species.

Rationale

Recent forest inventory data (USFWS 2006) reveal a paucity of seedling and sapling-aged trees and shrub vegetation in the refuge's northern hardwood forest understory. Diversity of shade-tolerant tree species in the understory was lower than that of the canopy. Lack of regeneration and subsequent understory forest structure and diversity means a diminished quality of habitat for migratory birds dependent on midstory structure for breeding, a forest less resilient to stochastic and catastrophic events, and reduced capacity to sustain itself over time. Many long distance migratory birds appear to rely more heavily on well developed, multi-layered forests than resident and short-distance migrants (DeGraaf et al. 1998). In Canaan, the lack of midstory woody species is likely due to intense browse pressure of white-tailed deer leading to the wide-spread growth of New York and hay-scented ferns. This interaction has been found in other northern hardwood forests. In Allegheny northern hardwoods, Horsley and Marquis (1983) found dense hay-scented fern cover prevented the establishment of most woody species. Species such as Rubus and yellow birch, which could penetrate the fern cover, were browsed by deer. In locations where Rubus was able to become established, fern cover decreased.

Many declining forest bird species in BCR 28 are reliant upon forest habitat with dense understory development, historically caused by local disturbances. However, excessive deer browse and a lack of forest management have reduced the abundance of this important forest understory structure throughout the BCR

(Rich, T.D. et al. 2004). These conditions are prevalent on the refuge as a recent forest inventory documented in 2006 (USFWS 2006a). The Canada warbler, a species of conservation concern for BCR 28, often is found in mature forested habitat with tree gaps allowing for the development of localized understory shrub and sapling development. In West Virginia, this species was more prevalent in forested habitat where individual trees were cut simulating natural tree-throw (Maurer and Whitmore 1981). Abundant deer populations have been correlated with lower Canada warbler abundance indicating impacts of deer from the suppression and removal of forest understory vegetation (DeGraaf et. al 1991). Improved forest structure will also benefit other understory dependent migratory birds such as ovenbird, worm-eating warbler, black-throated blue warbler and mourning warbler.

Selective low-volume logging that mimics natural disturbances of a mature forest in approximately half acre patches has been associated with lower predation rates on successional and understory dependent species like indigo buntings. These temporary and scattered gaps create "edge" habitat in small patches that may not support large numbers or regular use of mammalian predators (Suarez et al. 1997). Additionally creating small tree gaps in forested habitat provides improved structure and food resources important for a variety of migratory birds (Noss and Cooperrider 1994, Rotenberry et al. 1995). Species of conservation concern reliant upon this type of habitat in BCR 28 include black-throated blue warbler, Canada warbler, Eastern wood peewee and worm-eating warbler. Other wildlife requiring understory seedling and sapling development such as small mammals and woodland salamanders will also benefit. Ensuring deer browse does not significantly impact woody species regeneration is essential in the development of this understory habitat type.

Maintaining ecosystem functioning and natural processes includes managing for the diversity of understory flora. Herbaceous plants are indicators of forest health and condition (Keddy and Drummond 1996). High levels of browse over long periods of time from white-tailed deer is linked to local extirpation of forb species (Jenkins et al. 2007; Carson, et al. 2005; Augustine and Frelich 1998). Deer browse of native plants may also be linked to increased invasive plant presence, particularly garlic mustard, in otherwise diverse ecosystems. When combined with canopy impacting invasive forest pests such as hemlock wooly adelgid, deer were found to exacerbate the problem of invasive species in forested communities (Eschtruth and Battles 2009).

Ken Sturm/USFWS

Fritillary butterfly on butterfly weed

Reducing browse pressure on browse-sensitive herbaceous plants will allow their persistence and perpetuate the natural diversity of flora as a component of an integral forest ecosystem. Glade spurge (S2G3) and the eastern rough sedge–wavy leaf moss sloping forested seep communities (S3G3) occur in the refuge's northern hardwood forests and are considered vulnerable to extirpation, by the WVDNR and NatureServe. The persistence of these globally vulnerable conservation targets will benefit from the reduction of browse pressure.

Exotic forest pests such as beech bark disease, maple anthracnose, Asian longhorn beetle, woolly adelgids, and emerald ash borer threaten the health of the refuge's northern hardwood forests. Public education and outreach on the threats exotic pests pose to the forest and the role people play in bringing the pests to the area will assist in preventing or diminishing the introduction of new pests. Management responses to control exotic pests vary by species and adapt to the current scientific understanding of the species. As threats appear, investigating the latest, best management practices will ensure the most appropriate response.

Strategies

Within 0-3 years of CCP approval:

- Identify and map forest stands with high woody species diversity of seedlings and low midstory density. Target these areas for increased deer harvest and/or exclosures.
- Locate forest seep communities and glade spurge populations and develop monitoring protocols to indicate the communities' and species' persistence.
- Develop and implement a monitoring plan for presence of forest pests and respond to the threats as practicable with the best current management strategies available.

Within 3-5 years of CCP approval:

- Develop a flexible outreach and education program to reduce potential threats of forest pests and limit visitor use as necessary to prevent the spread of these pests.
- Establish and monitor five deer exclosures with controls to increase woody species recruitment, to act as refugia for browse-sensitive herbaceous and woody species, and to demonstrate the severity of deer browse pressure on the forest ecosystem in Canaan.

Within 5-10 years of CCP approval:

- Monitor stem density and species richness of understory development management areas to determine effects of deer browse on regeneration.

Within 10-15 years of CCP approval:

- Improve habitat structure for refuge focal species through thinning and/or other stand improvement operations. Methods include, but are not limited to girdling operations, single tree or group selection cuts of up to one-half acre in size with cutting cycles of 15 to 20 years in order to maintain understory development.
- Identify and prioritize even-aged stands for single tree fall disturbance to increase age class diversity.

Throughout the Life of the CCP

- Work with partners (State, Federal, and private communities) to manage deer densities on the refuge and surrounding lands in Canaan Valley that are compatible with objectives of understory woody and herbaceous forest development and protection.

Objective 2.3: Mature Northern Hardwood Forest

Restore late-successional forest characteristics in the northern hardwood forest to improve habitat for the threatened Cheat Mountain salamander, the West Virginia northern flying squirrel, and other amphibian, mammal, and migratory bird species of conservation concern. Target characteristics include increasing density of snags, increasing downed coarse woody debris, and increasing the density of large trees (>50cm dbh).

Rationale

Mature, late-successional forest in West Virginia and in the High Allegheny Plateau is scarce. Although 78 percent of the State is forested, currently less than 1 percent occurs in stands 90 years old or greater (USFS 2006). Historical accounts indicate that most of the trees in Canaan Valley were cut. Mature forest stands, uncut and greater than 200 years old, are absent from the valley. Periodic harvesting within the valley focused on removing black cherry and maples. The resulting forest communities are young and deficient both in species and forest structure diversity.

Late-successional forests, those forests 100-200 years old and regenerating after cutting or disturbance, are ecologically significant as reservoirs of biodiversity and habitat for late-successional dependent species. Diverse, healthy, and naturally resilient forests are an important component of a sustainable ecological system and provide habitat for a variety of species dependent upon mature forest characteristics. This forest sere is the link in the continuum from early successional habitat following disturbance and old-growth conditions.

Late-successional forests are characterized by large trees and snags, abundant coarse woody debris, a deep organic soil layer, and specific lichen and moss species living on dead wood (Whitman and Hagan 2004). Species dependent on these characteristics tend to be non-charismatic, such as mosses, lichens, fungi, and insects (Hagan and Whitman 2004). Providing habitat for these species maintains biodiversity that is likely to have implications for the ecological integrity of the forest system, even if those implications are currently unknown.

The refuge is imbedded in a forested area. The surrounding public and privately owned forests are not intentionally managed for late-successional stages. However, the recent Monongahela National Forest Plan (USFS 2006) notes that future mature forest stands will become established in wilderness areas and other areas of special interest. Dolly Sods, a wilderness area managed by the Monongahela, borders the south-east corner of the refuge. By managing for late-successional northern hardwood forest, the refuge can contribute to the development of late-successional characteristics over a larger landscape in

David Seals

Northern hardwood forest

the Allegheny highlands. This objective contributes to the biological integrity, diversity, and environmental health of the landscape surrounding the refuge, which complies with Service directives (601 FW3 3.7(c)).

Managing for late-successional forests also provides for the continuity of diversity and integrity of the area's forests. This continuity means that over centuries, the presence of large trees and coarse woody debris continues, regardless of local disturbances. Limiting manipulation of the northern hardwood forest to the simulation of natural disturbances (single tree fall gaps) and limiting early successional management to the edges of the forest ensures this continuity.

Improving late successional characteristics of forest stands will benefit focal species such as the threatened Cheat Mountain salamander and the recently delisted northern flying squirrel on the refuge. Increasing coarse woody debris and moving towards a more mature forest with a closed canopy will help improve micro-habitat conditions for the Cheat Mountain salamander as well as all terrestrial woodland salamander species. Increased coarse woody debris will also increase foraging opportunities for the northern flying squirrel through increased presence of fungal (truffle) growth. Larger trees with more interconnected branches, snag formation, and promotion of spruce regeneration will improve general habitat conditions for the West Virginia northern flying squirrel. Migratory birds of concern such as saw-whet owl and brown creeper will benefit from increased cavity availability and sloughing bark for nesting opportunities.

The 15 year scope of our CCP falls far short of the decades used to measure tree growth and stand development in the mixed forest. This objective requires consideration of a much longer timeframe within which to measure and achieve results. As such, our expectation is that it will take at least 100 years to accomplish this objective given the current state of refuge forested habitat. This timeframe is based on our prediction of how long it will take to achieve the forest and stand composition and structural characteristics targeted for our refuge focal species identified in the objective statement.

Strategies:
Within 0-3 years of CCP approval:
- Survey for Indiana bat presence and habitat use using mist nets and acoustic monitoring equipment in upland forested habitats, particularly near potential roosting areas, and determine appropriate conservation and management actions.

- Determine summer roosting and foraging locations in Canaan Valley using radio telemetry of Indiana bats captured in mist nets.

Within 5-10 years of CCP approval:
- Identify and map stands with late-successional characteristics by compiling regionally appropriate indicator characteristics (e.g. presence of certain moss and lichen species, number of snags per hectare, and number of trees > 50 cm dbh per hectare) and surveying stands for presence of these indicators.

Within 10-15 years of CCP approval:
- Improve habitat structure for refuge focal species through thinning and/or other stand improvement operations. Methods include, but are not limited to, girdling operations, reserve shelterwood cuts, or single tree or group selection cuts of up to one-half acre in size with cutting cycles of 15 to 20 years in order to maintain understory development. Retain approximately 6 snags > 15cm dbh per acre.

- Identify and prioritize even-aged stands for single tree fall disturbance and other silvicultural treatments to increase age class diversity.

- Develop monitoring metrics for inclusion into the HMP such as percent coarse woody debris, number of snags and measures of micro-topography and structural complexity.

Throughout the Life of the CCP
- Monitor breeding bird response to management.

- Conduct monitoring surveys for Cheat Mountain salamander and northern flying squirrels associated with this habitat.

Objective 2.4 (Mature Conifer Spruce / Mixed Forest)

Advance late-successional characteristics in 214 acres of coniferous and mixed coniferous forests to maximize breeding and foraging habitat for Blackburnian warbler, black-throated blue warbler, saw-whet owl, West Virginia northern flying squirrel, Cheat Mountain salamander, fisher, and other wildlife species of special concern. Target characteristics include increasing density of large diameter spruce trees and snags, conifer canopy cover, cover of coarse woody debris, and increasing mid-story stem density (1-12 cm dbh size class). We will strive to achieve 60 percent occupancy by Blackburnian warblers in all spruce-dominated forests larger than 2.5 acres and increase occupancy by black-throated blue warblers by 10 percent over the next 15 years.

Rationale
Historical documents from the Canaan Valley area recall a time when a vast spruce forest covered the high Allegheny plateau, including the wetlands and uplands of the valley. The refuge currently protects approximately 32 acres of upland red spruce forest and 182 acres of mixed spruce-hardwood forest. Most of these stands occur on the high elevation ridges of Cabin Mountain. Red spruce forest classification was recently completed in the State and integrated into NatureServe. Rankings developed for the upland spruce communities on the refuge indicate they are either imperiled or vulnerable at both the State and global levels.

The red spruce forests of the refuge and the high Allegheny plateau harbor a unique, boreal assemblage of flora and fauna. Fisher, saw-whet owl, the recently de-listed West Virginia northern flying squirrel, and the Federally threatened Cheat Mountain salamander occur in the high elevation spruce forests. These and other species of the spruce forests find optimal habitat where late-successional characteristics are prevalent. The NNL designation (1974) and the refuge's 1979 EIS recognized the importance of protecting this unique, relict boreal ecosystem.

Maintaining the integrity and restoring the pre-settlement character of the spruce forests where practicable are mandated in the Service's Biological Integrity, Diversity, and Environmental Health Policy (601 FW 3) and continue to be relevant. By managing the existing red spruce forest for late-successional characteristics, 20 species identified in the WVDNR's Wildlife Conservation Action Plan (2006) as in greatest need of conservation concern in the State will benefit. PIF identified Blackburnian and black-throated blue warblers as priority species of management concern in BCR 28, and as species of high regional concern within Physiographic Area 12. Due to the disjunctive distribution of mixed spruce habitats within Area 12, existing habitat is considered a very high conservation concern (PIF 2003). Blackburnian warblers are experiencing a 3.8 percent decline per year within Physiographic Area 12 and even a steeper decline (9.0 percent decline per year) within West Virginia. Although range-wide trends for this

species are positive (0.8 percent per year), most studies indicate that the Canadian populations are responsible for this increase (Morse 1994).

Breeding habitat and seasonal territory for Blackburnian warbler has been found to average about 1.1 hectares (~2.7 acres) in forests similar to Canaan Valley: largely deciduous with patchily distributed conifers (Sherry and Homes 1985). Where spruce cover is denser, territories were smaller, typically between 0.4 and 0.6 hectares (~1 to 1.5 acres) in size. For this reason, we are using a minimum patch size of 2.5 acres as a management target for increasing the size of existing spruce cover for accommodating the assumed minimum territory for breeding Blackburnian warblers on refuge lands.

Black-throated blue warbler populations are considered stable within Physiographic Area 12. This species has a relatively small range and low densities even in suitable habitat. It requires dense understory structure for nesting which is generally poorly developed on the refuge due to heavy deer browse and fern encroachment following logging activities. This species is sensitive to structure and forest types which are restricted on the refuge and the central and southern Appalachians.

Increasing large spruce and snag density and coarse woody debris cover will ensure persistence and future expansion of existing Cheat Mountain salamander and West Virginia northern flying squirrel populations on refuge lands. The refuge's even-aged stands provide a different structure in the forest than the former uneven-aged stands. Applying silvicultural techniques to increase the late-successional characteristics of the spruce forests can restore structural diversity of the stands and provide higher quality habitat for these species (Rentch et al. 2007, Carey and Wilson 2001). The refuge entered into an MOU with partner agencies and organizations in 2006 which focuses efforts on the protection and enhancement of spruce habitat and late-successional characteristics.

Red spruce forests on the refuge and in the high Allegheny plateau are geographically and environmentally restricted and their former extent has been reduced to more or less isolated, small patches by logging and the regeneration of northern hardwoods replacing the spruce stands. This scarcity of habitat increases the risk posed by environmental threats to the ecosystem. Improving the quality of the existing spruce stands will provide increased resiliency to the threats facing these high elevation forests on the refuge.

Strategies:
Within 0-3 years of CCP approval:
- Identify all forest stands greater than 2.5 acres where red spruce is dominant. These stands will become the baseline breeding habitat locations for focal migratory bird species.

- Develop and implement a forest understory habitat management plan for existing spruce forests which encourages shrub and sapling understory growth across large tracts of spruce dominated forest, retaining coarse woody debris and minimal removal of overstory cover.

Within 3-5 years of CCP approval:
- Improve habitat structure for refuge focal species through thinning and/or other stand improvement operations. Methods will include, but are not limited to, girdling operations, single tree or group selection cuts of up to one-half acre in size with cutting cycles of 15 to 20 years, and reserved shelterwood cuts. All management locations will be inventoried for Cheat Mountain salamander presence prior to cutting. We will consult closely with the Service's West Virginia Field Office (WVFO) and comply with the Recovery Plan recommendations during planning of cutting operations.

Throughout the Life of the CCP

- Conduct landbird point counts in spruce dominated forests to monitor focal migratory bird species breeding densities and track changes relative to habitat management.
- Conduct monitoring for focal species and other species of conservation concern in relation to spruce management areas.
- Protect the core of the spruce-dominated forests from disturbance, fragmentation, or invasive species infestation.
- Conduct monitoring surveys for Cheat Mountain salamander and West Virginia northern flying squirrel associated with spruce habitat.
- Work with partners to experiment with methods to achieve late-successional characteristics.

Objective 2.5 (Conifer Spruce / Mixed Forest)

Expand the areal extent of understory and canopy spruce by at least 25 percent in conifer and hardwood dominant forests to increase the potential future spruce-dominated forest and habitat for high elevation, conifer-forest dependent species such as Blackburnian warbler, black-throated blue warbler, saw-whet owl, fisher, West Virginia northern flying squirrel, and Cheat Mountain salamander.

Rationale

Historical accounts of forest communities within and surrounding Canaan Valley indicate they were heavily dominated by conifers, mostly red spruce, prior to the late 1800s. Red spruce is a component of the relict montane forest community in West Virginia. Spruce forests of West Virginia are listed as an "endangered ecosystem" by the USGS (Noss, R. F. 2000). They have experienced 85-98 percent decline from their original range. In Canaan Valley, this plant community has been severely degraded and in many locations entirely removed from the landscape following extensive logging operations and fires. Originally thought to cover as much as 500,000 acres, with some estimates as high as 1 million acres, red spruce and spruce/hardwood forests now cover less than 50,000 acres in the State. The refuge will work to increase the extent and quality of red spruce forests in the existing locations and others provided by historical information and ecological modeling. The extent of spruce forest predicted over the next 15 years will be only a piece of the long term restoration vision of the refuge. The HMP will provide greater detail in locations of planting and silvicultural treatments to further this goal.

The spruce forest of the West Virginia highlands provides unique habitat for a variety of wildlife species typical of more northern areas such as fisher, snowshoe hare, saw whet owl, and northern goshawk. In its WVCAP, WVDNR identified red spruce forest as a habitat "at-risk" with high conservation value. The WVCAP also identified 20 species in "greatest need of conservation" found in this habitat. Additionally, the threatened Cheat Mountain salamander and the recently de-listed West Virginia northern flying squirrel are found in close association with spruce forests. The lack of suitable habitat including the red spruce forest and the degraded and isolated condition of existing spruce forest were the primary reasons for listing the Cheat Mountain salamander and the West Virginia northern flying squirrel under the ESA, although the squirrel has recovered and was recently delisted. Increasing spruce forest on refuge lands will help improve local northern flying squirrel populations on refuge land.

Current stands of red spruce on the refuge are highly fragmented and exist almost entirely on the ridge line of southern Cabin Mountain or in isolated

pockets of riparian corridors and bottomland forest swamps. Many existing spruce dominated stands are not large enough to provide significant habitat for migratory species of concern such as Blackburnian warbler. Additionally, refuge stands are generally isolated patches without corridors or connectivity with other stands within the refuge or to neighboring forestlands.

Improving the size and connectivity of red spruce forest on the refuge will help long term management and protection of species with the highest need for conservation in the State and within the flyway. Surveys by refuge staff have documented populations of the threatened Cheat Mountain salamander which are apparently isolated from each other due to the changes in forest community and loss of spruce dominated forest stands. Connectivity between refuge and USFS red spruce forest will be important for the stability of the recently de-listed West Virginia northern flying squirrel on refuge lands.

This objective is consistent with the goals of the multi-agency MOU for the conservation of the red spruce–northern hardwood ecosystem established in 2006. The MOU emphasizes the need for land management agencies and other organizations to work towards the protection and restoration of the historic red spruce ecosystem in the Allegheny Highlands. Signatory agencies have begun a collaborative working group focused on red spruce restoration within the Allegheny highlands and identified the importance of spruce restoration within the Canaan area. Canaan offers a large expanse of potential wetland spruce forest habitat which is otherwise lacking throughout West Virginia. Modeling efforts indicate that most of the wetland habitat within Canaan Valley is consistent with requirements for red spruce forests and is a candidate area for restoration.

Achieving the desired conditions detailed in this objective requires more than the 15 year planning window of this document. Nonetheless, strategic habitat management and planning efforts must be begun now and throughout the course of this 15 year plan in order to set the foundation for conifer restoration efforts on this refuge. We do not expect to meet all species and habitat objectives within the time frame of this plan but will work towards these objectives through active restoration and planning efforts within the refuge and between the refuge and its partners.

The refuge has been an active member in the Central Appalachian Spruce Restoration Initiative (CASRI) a collaborative working group for the restoration and conservation of the red spruce-northern hardwood forest ecosystem. This group includes the U.S. Department of the Interior, Fish and Wildlife Service (West Virginia Field Office and Canaan Valley National Wildlife Refuge); U.S. Department of Agriculture Forest Service (Monongahela National Forest and Northern Research Station); State of West Virginia (Division of Natural Resources and Division of Forestry); The Nature Conservancy, and the West Virginia Highlands Conservancy, among others.

CASRI has been practicing Strategic Habitat Conservation (SHC) in West Virginia since its inception in 2007. Utilizing the scientific expertise of several State and Federal agencies along with capabilities provided by NGO's, universities and private organizations we have been able to apply specific resource goals over broad political and geographic boundaries. The recent increase of SHC collaborative work by the Service has reinforced the CASRI's activities and could help expand and coalesce efforts as part of a Landscape Conservation Cooperative within the Appalachian Geographic Area.

(See rationale for Objective 2.4 for further discussion on this topic.)

Strategies:
Within 3-5 years of CCP approval:
- Identify and prioritize areas with greatest potential for spruce regeneration with emphasis given to suitable soils and aspect, proximity to existing spruce stands and riparian areas, and gaps and fragmentation created by old logging roads.

- Locate and monitor Cheat Mountain salamander populations and use this information to help understand the impediments to the viability of the populations.

Within 5-10 years of CCP approval:
- Work with partners to experiment with silvicultural techniques that will increase long-term canopy dominance of red spruce.

Within 10-15 years of CCP approval:
- Improve Cheat Mountain salamander habitat to increase the population's viability.

Throughout the Life of the CCP:
- Work with partners to maintain and perpetuate a source of red spruce seedlings available for planting on the refuge.

- Plant spruce seedlings in high priority areas for regeneration in at least 20 acres a year.

- Collaborate with land management agencies and adjacent land owners to increase connectivity of spruce stands across management boundaries.

- Identify, connect, and enlarge spruce stands by under-planting existing vegetation with spruce seedlings.

GOAL 3

Provide and promote through active management a diversity of successional habitats in upland and wetland-edge shrubland, old field, grassland and hardwood communities to sustain early successional and shrubland specialists such as golden-winged warbler, American woodcock, brown thrasher, Eastern towhee, field sparrow, and other species of concern.

Objective 3.1 (Forested Wetland–Aspen Woodlands)

Manage 114 acres of successional aspen communities on a 15-20 year rotational basis so that 75 percent is continually maintained in early successional stages (0-15 year class) with a high stem density and less than 60 percent herbaceous ground cover, to perpetuate and potentially expand and improve aspen habitat for golden-winged warbler, American woodcock, brown thrasher, Eastern towhee, and other priority migratory bird species.

Rationale
Quaking aspen is an important habitat type for a variety of migratory and resident birds. Young dense regenerating stands are important foraging sites for woodcock and other song birds. Older stands provide suitable nesting habitat (Sepik et al. 1981). In Canaan Valley, aspen communities were found to have one of the greatest avian species diversity of all habitats studied. Between 1978 and 1993 a total of 33 species were documented during the breeding season using aspen stands in Canaan Valley (Michael 1993, Michael 1992a). Successional habitat created by aspen management may be particularly effective in Canaan where deer browse pressure is high. Aspen root suckers may outgrow deer herbivory pressure in one season thereby making it an effective community type to manage for early successional habitat.

The decline of early successional and transitional forest habitat in the northeast is concurrent with the decline of species dependent on this habitat type (Sauer et al. 2007, Fink et al. 2006). On a regional scale, loss of small farms, commercial and residential development, suppression of historically important disturbances such

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Aspen wetland

as fire, and decrease in large area clear-cutting contribute to the loss of early successional habitat (Brooks 2003, Lorimer 2001, Trani et al. 2001). The suite of birds reliant on this habitat type are of high conservation priority in BCR 28 and the State (PIF 2003, WVDNR 2006) and includes American woodcock, Eastern towhee, field sparrow, indigo bunting, and brown thrasher.

The refuge's extensive shrublands, old fields, and young forests currently provide early successional and shrubland habitat that is scarce in the region, State, and local area. Managing for early successional and shrubland habitats on the refuge will ensure the persistence and protection of this habitat, unavailable in the surrounding landscape (Dettmers personal communication 2007, Smith et al. 2007). This may be particularly significant relative to the local extent of available managed early successional and shrubland habitat. The refuge is surrounded by forested lands including the Monongahela National Forest (Dolly Sods Wilderness Area) and two State parks where early successional habitat management is not a priority.

One technique used to create and maintain early successional habitat in the northeast is cutting for the regeneration of aspen stands. When cut, girdled, or burned aspen vigorously root sprouts, creating a dense growth of sapling aspen stems. The resulting cover is preferred foraging ground for American woodcock, ruffed grouse, and a variety of nongame migratory birds. The HMP that will incorporate these disturbance techniques will be a priority to maintain a mosaic of regenerating aspen on the refuge and contribute to the available early successional and shrubland habitat.

Generally, aspen management will occur in a mosaic to ensure that multiple age classes prevail across the landscape. Management of aspen will focus on selective patch cutting so that within an aspen management area, multiple age classes of aspen are represented to provide the breadth of habitat requirements for a diversity of wildlife species (Gullion 1984). Aspen management will be primarily

performed with hand crews but may include the use of fire and heavy equipment such as a hydro-axe where appropriate. Management will focus on perpetuating and increasing aspen across the landscape with target patch sizes of 3 acres or greater. However, even small aspen stands have been shown to be important for a variety of neotropical migratory birds (Turchi T.M et al. 1995). Preferred aspen management to perpetuate the stand and provide abundant sprouting is to cut the entire stand, rather than selection or single tree cuts. (Gullion 1984).

Quaking aspen stands in Canaan Valley are a successional stage in the development of mixed conifer forested wetlands (Byers et al. 2007, E. Byers personal communication). These forested wetlands are of high conservation value as they occur in the State as an outlier population considerably south of this species' primary range (Byers et al. 2007). Preserving a portion of the aspen stands will allow the development of the late-successional stages of the wetland forests and decrease the opportunities for the invasion of non-native plant species.

Beaver are a natural force regenerating aspen in Canaan Valley. The beaver browse young and mature aspen stems, stimulating root sprouting and the creation of dense pockets of new aspen stems. When the beaver population is unchecked, however, their preference for aspen can deplete an aspen stand and prohibit the dense regeneration favored by early successional bird species. Beaver trapping will balance the important role beaver play in maintaining the mosaic of wetland communities including aspen stands (refer to Objective 1.2) with the interest in maintaining dense regenerating aspen stands. For more information on how the refuge will utilize beaver management to achieve habitat goals, refer to the compatibility determination for furbearer trapping (beaver) in appendix B.

American woodcock is a priority species of conservation concern and an important management species for recreational hunters. As a species occurring in Canaan Valley in greater concentration and abundance than other parts of the State, the refuge identifies woodcock as an important management species. The Service developed the *American Woodcock Management Plan* in 1996 to help stem the decline in American woodcock (USFWS 1996). In 2008 the American Woodcock Conservation Plan was distributed by the Woodcock Task Force and identified recent trends and made recommendations for conservation on a continental scale. Long-term trends show a statistically significant decline of 1.03 percent in the breeding population of woodcock from 1968-2009 and a 2.55 percent decline in West Virginia during the same time period (Cooper et al. 2009). Although the breeding index for woodcock in West Virginia has been positive showing numbers of singing males to be slightly higher than predicted values for the State, long term trends show a continued decrease in singing male woodcock (Kelley and Rau 2006). Recruitment rates (number of immature birds per adult female) for West Virginia in recent years were consistent with regional recruitment rates but on average still below the long-term regional average (1963-2007) (Kelley and Rau 2006). Changes in singing male populations in West Virginia show a deficit of 17,222 males compared to densities observed in the 1970s (Kelley and Williamson 2008). The major causes for these declines are thought to be loss and degradation of habitat on the breeding and wintering grounds, resulting from forest succession and land use changes (Dessecker and McAuley 2001, Dwyer et al. 1983, Owen et al. 1977, Straw et al. 1994).

The WVCAP identifies American woodcock as a Priority 1 species for conservation (WVDNR 2006) and the USFS Forest Plan lists it as a "vulnerable" species in the Monongahela National Forest (2006). Additionally, American woodcock has been noted as a priority for the Canaan Valley refuge in all of its founding documents (USFWS 1979, USFWS 1994a). Canaan Valley continues to support the largest documented fall migration habitat in West Virginia and

accounts for the largest percentage of woodcock harvest of any area in the State. Management of early successional habitat is necessary to maintain and improve habitat for this species for both nesting and migration habitat.

Woodcock require several different habitat conditions that must be in close proximity to one another. Functional foraging habitat for woodcock occurs on moist, rich soil dominated by dense shrub cover (75-90 percent). Young shade intolerant hardwoods and aspen create ideal habitat as feeding areas and daytime (diurnal) cover (Kelley and Williamson 2008). Other habitats include clearings for courtship (singing grounds), large openings for night roosting, and young second growth hardwoods (15-20 years) for nesting and brood-rearing (Kelley and Williamson 2008, Sepik et al. 1981; Keppie and Whiting 1994). Recommendations for the stabilization of early successional habitat are to focus on cutting mature forest types that are potentially suitable for woodcock habitat as well as allowing non-forested habitat to mature into habitat that will support woodcock (Kelley and Williamson 2008).

The refuge will work with partners such as the Wildlife Management Institute, universities, and the WVDNR to develop early successional habitat research and management demonstration areas that include a variety of early successional habitat types as described in Objectives 3.1, 3.2 and 3.3. The purpose will be to establish at least one site on the refuge which can demonstrate effective habitat management for priority early successional species of concern in BCR 28, such as American woodcock, Eastern towhee, and Canada warbler. Several areas are indicated on map 4-1 for potential demonstration sites where a mosaic of plant communities will be managed together to best meet the needs of priority early successional migratory birds. The refuge, in consultation with its partners, will establish at least one site for these purposes. If management capability permits, research needs develop, partner support is sufficient, and the action does not conflict with the objectives for older growth forest management elsewhere in this plan, other demonstration sites will be included under this management action. Management methods within demonstration areas may include forest cutting, mowing, grazing, and prescribed fire. Monitoring and research will be emphasized to communicate results of management to the public and other State and Federal agencies.

Strategies

Within 0-3 years of CCP approval:

- Develop and implement a HMP detailing aspen management for successional wildlife habitat with an emphasis on improving breeding and foraging habitat for American woodcock, golden-winged warbler, and other migratory birds.

- Develop or adapt (from others) monitoring protocol consistent with the furbearer management plan to assess beaver activity near regenerating aspen stands and continue to manage beaver populations adjacent to aspen management areas to prevent excessive damage.

- Work with partners to establish early successional management demonstration sites which include aspen communities.

Within 3 to 5 years of CCP approval:

- Identify and designate aspen stands where perpetuation of natural succession to forested swamps will occur. New vegetation mapping will be sought to identify new aspen stands on refuge land.

Throughout the Life of the CCP:

- Conduct landbird point counts and woodcock singing ground surveys to assess performance of managed aspen habitats for meeting fundamental objective (Objective 3.1) and to determine the need for future management actions.

- Manage aspen annually through block cutting to promote early successional habitat and to prevent the loss of aspen habitat through successional development within the management areas.

Objective 3.2 (Northern Hardwood Forest–Edge Habitat)

Use accepted silvicultural practices within 1,130 acres of forest edge areas to create openings, promote understory development, and develop and sustain breeding and foraging habitat for American woodcock, Eastern towhee, brown thrasher, Canada warbler, and other species of concern.

Rationale

Northern hardwood forests comprise approximately 6,400 acres on the refuge, occurring primarily on the slopes of Cabin, Brown, and Canaan mountains and along Middle Ridge. Shrubland and old field meadows typically surround the forest on the more gentle toe-slopes before transitioning to wetland communities. Pockets of northern hardwood forest, less than 8 acres, occur within the toe-slope shrublands and meadows. Together, these forested islands account for nearly 500 acres of forested habitat. However, with less than 100 m buffering their edge and interior, they function entirely as edge habitat and provide little benefit to forest interior species.

The refuge is identifying these pocket-forest areas and a 100 meter-wide band at the edge of the main body of the northern hardwood forest as suitable for reverting to early successional habitat. The 100 meter-wide band of northern hardwood forest identified as suitable for cutting will be limited to protect sensitive plant communities and habitat features. Riparian buffers greater than 100 meters on each side of water features will be maintained. Rare or sensitive plant communities will be avoided, including areas with limestone-influenced soils. The forest gap along Sand Run and upper Glade Run is excluded in order to maintain the connectivity between the forests of Middle Ridge and Cabin Mountain. Areas will be prioritized based on their proximity to suitable breeding, foraging, and migration habitats and to other early successional habitat management activities.

Converting the forest islands and edges to early successional habitat will provide additional nesting habitat for priority species of concern such as brown thrasher, Eastern towhee, and American woodcock, post fledging habitat for forest bird species, and important migration foraging and staging areas. Early successional habitat is important as most species, especially migratory birds, associated with this habitat type are declining in the northeast (Sauer et al. 2005, Fink et al. 2006, DeGraaf and Yamasaki 2003). Providing successional habitat may be especially important on the refuge as the surrounding landscape is predominantly forested.

With the plan to increase early successional habitat by cutting forest, there will be a loss in extent of overall forested habitat and a slight reduction in the extent of forest interior habitat. However, we expect there to be minimal loss in habitat quality. The forested islands provide poor habitat for both forest interior and early successional species. Cutting along the forest edge may improve foraging habitat for forest interior bird species. Forest interior birds utilize successional vegetation as post breeding habitat (Chandler 2007, Vitz and Rodewald 2006, Vitz and Rodewald 2007, Denmon 1998, Pagen et. al 2000). Increased vegetative structure provides cover for inexperienced immature forest birds and more abundant food resources (particularly berry producing shrubs). Small patches of early successional habitat are important to post-fledgling, forest interior species and these species tend to avoid forest edges. This may indicate the potential importance of management to maintain discreet patches of early successional

Ken Sturm/USFWS

Blueberries

habitat in close proximity to forest interior breeding habitat for these species (Vitz and Rodewald 2006). Birds using Canaan Valley's forest interior habitat may benefit from regenerating forest adjacent to intact mature forest habitat (Dawson, personal communication 2007).

Management practices to convert forest edge to functional early successional habitat may include group selection, clear cuts or patch cuts of up to 5-15 acres in size. Sepik (1981) recommended patch cuts of 4 acres for woodcock management. Depending on deer browse impacts, some cuts may need to be larger. Cutting cycles and rotations may follow standard practices or be experimental to determine successful practices for Canaan Valley. Cutting cycles for northeastern woodcock habitat management typically range from 8 to 15 years and rotations from 20 to 40 years depending on habitat conditions. Canaan's management is expected to fall within these ranges. Some 3-5 acre openings may be permanently maintained primarily by mowing and brush clearing using mechanized equipment.

Management of this habitat will occur in a shifting mosaic of patches across the refuge as we implement decisions to allow fields, shrub, and young forest to transition to forest. Creating a series of variable-sized cuts along the forested toe-slopes of the refuge will allow early successional birds access to these newly created habitat types from adjacent suitable habitat along the forest-field edge. Because of the adjacent occupied habitat, successional forest edge cutting will serve to increase and improve the already existing habitat and ensure a continued availability of this habitat over time. Spacing of smaller cuts (0.2 acres or less) may be clustered to maintain an adequate level of early successional habitat across the landscape. Creation of a mosaic of smaller scattered forest cuts may prevent excessive nest predation typically associated with larger and permanently maintained openings (Suarez et al. 1997).

Due to the potential for Indiana bat use of upland forests in close proximity to wetland and riparian corridors the refuge will inventory management areas for bats prior to management actions. We will consult with the Service WVFO closely prior to conducting these operations.

Landbird point counts in regenerating successional habitat will be used to evaluate success of management actions for the targeted migratory bird species and fulfilling our objective. However, meeting this objective will also depend upon the impact of deer browse on desired woody regeneration. Therefore we will also evaluate regeneration success of cut forested habitat to determine the impact of white-tailed deer browse and fern encroachment on species diversity and succession of woody species. Deer densities on the refuge appear to be reducing forest regeneration. Recent harvest information (2002-2004) indicates that deer densities on the refuge may range between 17 to 30 deer per square mile (USFWS unpublished data, Gary Foster personal communication 2006) and a recent forest inventory on the refuge documented a lack of seedling and sapling forest species. A deer density that permits the success of successional forest development will be imperative to achieve this objective.

If woody regeneration success is not achieved (target stem densities, species diversity) or desired occupancy of focal migratory bird species is not met, the refuge will revise the management strategies to achieve this objective. This could include working with the WVDNR to decrease deer densities on the refuge and adjacent lands, fencing, and changing the size and spacing of cut areas. Target stem densities of regenerating hardwoods in one study were documented for northern hardwood forests as ranging from 91 to 297 stems per acre from 1 to

five years following a cut (Martin and Hornbeck 1989). Stem density, regenerating species diversity, presence and abundance of invasive species, and habitat use by targeted focal species will be used to evaluate the success of this objective.

Refer to rationale under Objective 3.1 for additional information on the importance of early successional habitat and demonstration site development.

Strategies:
Within 0-3 years of CCP approval:
- Develop and implement a Habitat Management Plan dealing with successional forest management plan for transitional hardwood forest communities.

- Develop and implement a monitoring plan to evaluate regeneration success relative to deer browse impacts and fern encroachment.

Within 3 to 5 years of CCP approval:
- Work with partners to establish early successional management demonstration sites, as described in the rationale for Objective 3.1, which include even aged stand management of forest edges

Throughout the Life of the CCP:
- Conduct landbird point counts during breeding and survey areas during migration to assess performance of managed successional hardwood forests for meeting fundamental objective above and to determine need for further management (set-back maintenance, selective thinning-out of tall tree species).

- Manage northern hardwood forest edge habitat through cutting of 10-15 acre blocks on a 15-20 year rotation to create openings, promote understory development, and sustain early successional habitat for American woodcock, Eastern towhee and other early successional species. Areas will be surveyed prior to cutting for the presence of Indiana bats. The refuge will use partnerships when necessary and available to conduct edge cutting operations.

Objective 3.3 (Shrubland and Old Field)

Allow natural succession to occur in 2,482 acres of old fields, convert 216 acres of grasslands, and maintain 853 acres of shrub communities 2-10 feet tall, interspersed with herbaceous openings to improve habitat for high priority, shrub-dependent birds of conservation concern such as golden-winged warbler, American woodcock, Eastern towhee, brown thrasher, and field sparrow.

Rationale
Shrub-dependent species are a declining bird group due to loss of early successional habitat. The PIF Continental Plan specifically recommends the management and protection of shrub habitat to help reverse declines of priority bird species (Rich, T.D. et al. 2004). This habitat type is also given a high conservation priority in the PIF Physiographic Area 12 plan (PIF 2003). In particular the plan notes the importance of high elevation areas providing naturally occurring shrub communities to support some of the most imperiled migratory birds of this habitat group. Shrub and old field habitats are also important for migrating land birds and raptors many of which are species of conservation concern from the Northern Forest and Eastern Biomes (Rich, T.D. et al. 2004). Management actions even on smaller tracts for shrub habitat can be effective as shrub dependent birds are not typically sensitive to habitat patch size and many will use small patches of shrub habitat (Watts 2000).

Shrub habitat comprised of various shrub species, or a diverse mix of young trees, provides an abundance of insect food for breeding birds which need to consume large amounts of protein for reproduction and feeding young. Many shrub species bear fruit in the fall which help boost the fat reserves for migrating or over-

wintering birds. The structural density in this habitat type provides cover from predators and shelter from harsh weather. Shrubby, early successional patches in close proximity to interior forest breeding territories are important for survival of fledgling forest birds, which feed on the abundant food sources in relative safety from predators in the dense foliage.

Planting alder may increase the amount of manageable alder habitat for woodcock in locations where soils are not saturated. These non-saturated areas provide suitable habitat for large numbers of earthworms, which are an important food source for woodcock. Alder in Canaan Valley currently grows mainly along flood plains of larger streams such as the Blackwater, North Branch, Little Blackwater, and Glade Run. Soil saturation is usually high in these sites with periods of flooding seasonally. Wet saturated soils are considered to be less functional as foraging areas for woodcock because of the low density of earthworms and higher density of herbaceous understory vegetation (Sepik et al. 1981, Weik pers.

Richard Baetsen/USFWS

American woodcock

comm. 2006, Williamson 2008). Propagation and planting of alder in drier sites adjacent to breeding and cover sites, although labor intensive, is an option to provide higher quality foraging habitat in alder cover. The refuge currently has an agreement with NRCS to propagate alder for this purpose. Sites for cutting alder will be evaluated prior to cutting to assess soil saturation and occurrence of other resources of concern. Typically we expect to inventory alder communities to identify drier alder sites for management which will be cut by hand crews. Size of the cut will depend primarily on hydrology and locations of plant communities of concern.

Old field habitat occurs as abandoned pasture or hay fields typically interspersed with hawthorn, spirea, St. Johnswort and other shrubby species. Some areas on the refuge appear to be slowly reverting to more woody species while others appear to be in a long term early successional/old field state. Fortney notes a slow shift from grass dominated habitat to shrub and young forest stands in a comparison of Canaan Valley habitats between 1975 and 1997. Similarly, the rate of early transitional forest types apparently slowed during the same period

(Fortney 1997). Density of grasses and bracken ferns as well as distance from seed tree sources and extensive deer browse pressure may explain the long term maintenance of this community type in Canaan Valley (Fortney and Rentch 2003). Nonetheless, the persistence of this open habitat interspersed with hawthorn and shrub thickets provides important habitat for a variety of breeding and migratory birds including field sparrow and northern harrier.

American woodcock favor woody succession habitats on moist soils where worms are abundant and use the shrubby forest floor for nest sites. Because of the high moisture content, these areas tend to be composed of woody vegetation in either shrubs or young tree species or both. Woodcock also need more open, short-grass habitat for singing and display territory during the breeding season, so shrublands in close proximity to short grasslands are ideal. Eastern towhee and brown thrasher prefer drier shrubby habitats such as are typically found along forest and field edges where vegetative growth is more complex and offers a variety of fruits, nuts, and insects among the leaf litter. Field sparrows favor old field/forest edges where woody encroachment, tall forbs, and shrubs are well-represented in an otherwise open habitat, and where they can quickly flee for cover in the adjacent forest. This scenario is frequently found in landscapes containing a mosaic mix of field and forest or in regenerating cut-over areas. Allowing old fields to develop into shrubby successional habitat is recommended as a management technique by the Woodcock Task Force (Kelly and Williamson 2008).

Under this objective the refuge will consider the use of prescribed grazing within the research demonstration areas to reduce herbaceous and woody vegetation, particularly under hawthorn savannah habitats. Dense hawthorns are important foraging areas for woodcock and are difficult to maintain utilizing mechanized equipment. Animals used for this purpose will be carefully managed to ensure stocking and duration meet habitat management goals of vegetation control. Once these goals are met, animals will be removed from the area. Should the refuge decide to use prescribed grazing, we will use the early successional demonstration areas as the evaluation site and we will develop a monitoring plan for vegetation response (both native and invasive species) as well as for wildlife response for targeted focal species. Before we employ prescribed grazing as a management tool we will need to write a compatibility determination for this use to ensure that grazing will not interfere or detract from the purposes for which the refuge was established or the mission of the Service.

Protection and management of these habitats will provide benefits to a diversity of other migratory birds and State species of concern. Both alder flycatcher and swamp sparrow are State species of concern that heavily utilize the shrub thicket habitats on the refuge. Invertebrate species of concern such as Atlantis fritillary and Harris' checkerspot utilize flowering plants in old field habitats for nectar sources such as ox-eye daisy, hawkweeds, milkweeds, and spirea (Allen 1997). Maintaining these shrub and old field communities will ensure that the refuge not only supports migratory bird species of concern on a regional context but also maintains local populations of State species of concern.

Refer to rationale under Objective 3.1 for importance of early successional habitat and demonstration site development.

Strategies:
Within 0-3 years of CCP approval:
- Develop and implement a shrub and old field habitat management plan as part of the overall HMP.

- Establish at least one demonstration area, easily accessible and visible from public access roads or trails, to demonstrate early successional management techniques and wildlife habitat response, as described in the rationale for Objective 3.1.

- Allow succession to occur on 216 acres of managed grassland and 2,482 acres of old field habitat to maintain and increase shrubland habitat.

- Identify and prioritize suitable locations for alder planting, conduct experimental plantings and monitor results.

- Identify locations where alder communities occur in unsaturated and drier soils, and prioritize and conduct experimental cutting for alder regeneration. Alder rotations will be approximately 20 years.

Throughout the Life of the CCP:

- Conduct landbird point counts during breeding, migration, or winter to assess performance of managed shrub and old field habitats for meeting the fundamental objective above and to determine the need for further management (set-back maintenance, selective thinning-out of tall tree species).

- Set-back succession by mowing or grazing 5-10 acre blocks of spirea, St. Johnswort and other fast growing shrub communities on a two to four year rotation to maintain singing ground habitat for American woodcock. Increased emphasis on shrub mowing will be in locations adjacent to other woodcock management areas or to accelerate habitat suitability of early successional bird habitat where it has been lost through successional development.

Objective 3.4 (Managed Grasslands)

Manage 315 acres of grassland habitat in fields no less than 50 acres by maintaining suitable herbaceous ground cover, bare ground coverage, vegetation height, grass-forb ratios and limiting invasive plant establishment to maximize breeding and migration habitat for grasshopper sparrow, Henslow's sparrow, bobolink, and other priority grassland dependent birds.

Rationale

Birds depending on early successional habitats such as grasslands are one of the fastest declining bird groups because of habitat loss and changes in farming practices. Grasshopper sparrows, for example, have declined at a rate of 3.6 percent per year across the U.S. from 1966 to1994 and declined 5.4 percent per year in the northeast between 1966 and 2007 (Sauer et al. 1995, Sauer et al. 2007). Habitat loss, conversion of pasture to intensive row crops, increased frequency of mowing, and lack of fire are cited as the causes of population declines of this and other grassland-dependent species (Vickery 1996). Development and fragmentation of grasslands has continued in Canaan Valley reducing available nesting and migration habitat outside of refuge ownership.

Grassland habitat is considered a moderate to low priority at the BCR and physiographic area scale but is a declining habitat type in West Virginia (PIF 2003, WVDNR 2006). The physiographic plan specifically mentions the importance of maintaining early successional habitats within the larger forested landscape and notes that maintaining land currently in grassland habitat will contribute to conservation objectives for these species throughout the Northeast (PIF 2003).

The refuge does have the potential acreage to help sustain local populations of some declining obligate grassland species. Many grassland birds breeding on the refuge (grasshopper sparrow, savannah sparrow, eastern meadowlark) require at least 20 acres of contiguous grassland habitat (Jones and Vickery 1997). Breeding

grassland birds were found to respond more to vegetative structure and vertical diversity than to field size on the refuge indicating that existing grassland acreage supports functional obligate grassland breeding bird populations (Warren 2001). Continued maintenance of intact functional grasslands on the refuge adds to local and regional grassland bird species conservation and provides areas where nesting is not disrupted by mowing, haying, or grazing activities.

The use of refuge grasslands by species like grasshopper sparrow, savannah sparrow, Henslow's sparrow, bobolink, and Eastern meadowlark adds to the avian diversity of the refuge. Additionally, five grassland birds listed as priority 1 and 2 species by the WVDNR use refuge grasslands as breeding or migration habitat thereby contributing to the State conservation of these species (WVDNR 2006). Research conducted by the Service at 13 national wildlife refuges in region 5 from 2001 to 2003 found Canaan Valley's breeding obligate grassland bird population to be one of the more diverse in the study. Additionally density of breeding grassland birds at Canaan ranked 5th out of the 13 refuges in the study (Runge et al. 2004).

The highest density of obligate grassland breeding birds averaged over three years of a regional grassland bird study (2001-2003) and three years of a productivity study (2002-2004) was 0.27 per acre (0.7 /hectare) for the two refuge grassland study sites. Savannah sparrows had the highest density of the four grassland obligate species found. Grasshopper sparrows have shown a positive trend following a prescribed burn on the Beall Tract and recent banding operations have documented site fidelity to this field for this species (USFS data unpublished). Applying these density estimates across all refuge fields managed for breeding obligate grassland birds, we can determine if management actions are meeting targeted occupancy and density measures. We can use the data to refine objectives in the future and determine if the desired field characteristics are correct for achieving the fundamental objective.

An additional measure to ensure the refuge is meeting this objective is to repeat productivity monitoring of grassland nesting species to ensure nest success meets or exceeds previous documented figures. Overall nest success of grassland species on the refuge was 63.7 percent during a 2002-2004 study. Periodic nest monitoring can help determine the effectiveness of refuge management actions. This will be particularly important as increasing amounts of suitable grassland nesting habitat adjacent to the refuge are either developed or fall out of active grassland management (hay production and grazing). Since the grassland bird productivity research was conducted, over 133 acres of private grassland habitat have been developed in Canaan Valley. These areas may affect productivity on refuge grasslands by increasing competition for nesting and foraging habitat, decreasing the amount of post-fledging dispersal habitat available and possibly increasing predation through alteration of habitat (home development increasing predator base and predator movement corridors).

By reviewing the nest success, relative abundance, contribution to local biological diversity, and peripheral benefits to other species of grassland birds, the refuge determines that continued grassland management is an important contribution to the refuge's biological resources. If future research determines that factors such as nest success or abundance are below levels which warrant continued active management for grassland obligate nesting species, the management regime may change to provide benefits to migrating landbirds, raptors, and small mammal using these fields.

The use of managed grasslands by migrating birds has not been well documented at the refuge. It is suspected that rank grassland habitat is important for a variety of land birds moving through the area, especially for sparrow species. However, open grasslands are also important foraging areas for raptors such as northern harrier (State conservation priority), and rough-legged hawk. Northern

harriers concentrate in Canaan Valley in the fall and spring, and have also been documented in June; however only one nesting record exists for this species in Canaan Valley from 1964. Rough-legged hawks winter in the Valley and forage in refuge grasslands. Another objective will be to provide forage and cover (August–February) for migrating land bird and raptor species including northern harrier, and rough legged hawk. Other priority species benefiting from grassland management include Henslow's sparrow, pink-edged sulfur, Harris'checkerspot, and Atlantis fritillary.

Strategies

Within 0-3 years of CCP approval:

- Develop and implement a management plan to improve grassland habitat for nesting and migratory bird species.

Within 3-5 years of CCP approval:

- Remove trees and fences which cause fragmentation and edge effects and consolidate adjacent fields separated by these edge-forming features into larger units to increase the percentage of effective interior habitat.

- Assess the use and evaluate the importance of managed grasslands to migrating landbirds and raptors.

Kent Mason

Bobolink pair

- Work with partners to establish early successional management demonstration sites which include grassland habitat.

Within 10-15 years of CCP approval:

- Work with private landowners and partners to encourage late haying and mowing of grasslands adjacent to refuge property.

- Work with private landowners to develop conservation easements and other land protection incentives to maintain grassland habitat in the surrounding area.

Throughout the Life of the CCP:

- Set back succession by a combination of mowing, haying, or burning on a three-year cycle or as needed to reduce woody encroachment on 315 acres (Beall north, Beall south, Cooper, Harper, Freeland, and Orders tracts) of grassland focused on breeding areas for grassland obligate bird species. Some fields require shorter rotations where soil moisture and proximity to colonizing tree and shrub species promotes competition with desired grasses and forbs. Maintaining rotations will ensure that standing vegetation is retained in some fields for migration habitat.

- Continue appropriate monitoring and survey programs as funding and staffing permits. The results of these surveys will trigger adjustments to strategies for management, or evaluation of objectives needing refinement. Examples of monitoring or surveys:

- Evaluate achievement of the fundamental objective (measure abundance, relative abundance, and density on selected fields annually throughout the life of the CCP) by conducting point counts established in grasslands for surveys during the breeding season (late May through June).

- Evaluate quality of grasslands for grasshopper sparrows by conducting periodic vegetation surveys (height, grass-forb ratio, and percent bare ground) during the breeding season at bird survey locations. If sparrow density or percent occupancy falls, and grass height, grass-forb ratio and percent bare ground are contributing factors, then the grassland management regime will be reevaluated.

GOAL 4

Visitors of all abilities enjoy opportunities for wildlife-dependent recreation and education to enhance public appreciation, understanding, and enjoyment of refuge habitats, wildlife, and cultural history.

Objective 4.1 (Hunting)

Within 5 years of CCP approval, at least 80 percent of hunters on the refuge will report having a high-quality experience.

Rationale

Hunting is one of the six priority public uses to receive enhanced consideration on national wildlife refuges according to the 1997 Refuge Improvement Act. Hunting is recognized in the Refuge System as a healthy, traditional outdoor past time, and is deeply rooted in our American heritage.

In many cases, hunting does not just offer a form of wildlife-dependent recreation. It also provides a means to keep animal populations in balance with the carrying capacity of the land. White-tailed deer hunting, for example, is not only a wildlife-dependent form of recreation but also a means to curb local deer population growth in the valley and better manage and meet habitat objectives for biodiversity. Reducing the deer herd on the refuge will enable success in managing early successional habitats for woodcock and other species. Deer hunting also provides assistance with statewide deer population control efforts. Also, local communities have relied on hunting to limit crop and landscape damage from deer, and to provide outdoor recreation.

In the strategies below we present several methods for increasing the deer harvest, such as providing access to deer in remote portions of the refuge. Opportunities for access may increase as we acquire more land within the refuge's approved acquisition boundary. We will expand hunting pressure on a broader, landscape level. A concerted effort is necessary to exert uniform pressure on the herd on and off refuge lands. At the same time we need to prevent deer from simply moving to adjacent lands which do not permit hunting. In the past, the WVDNR has worked with homeowners in Timberline to develop a special hunt on their land. However those efforts never came to fruition. Canaan Valley Resort State Park may have a management deer hunt in the future. We will also develop educational programs for visitors and hunters to explain what the carrying capacity for deer should be and why recreational hunting is needed to accomplish these goals.

While we plan to use feedback from hunters to help determine whether our strategies are contributing to a more high quality hunt, it will be important to remember that not all hunters have the same criteria for measuring the quality of a hunt. Some deer hunters equate a quality hunting experience with seeing a high number of deer, while other deer hunters may want more of a challenge. Furthermore, it is possible that woodcock hunters could be more satisfied with hunting on the refuge than deer hunters due to our proposal to create more early

successional habitat, as described in the above objectives. On the other hand, offering more areas for woodcock hunting may translate into more hunters, and this may not be a desirable outcome for some hunters.

Strategies

Within 0-5 years of CCP approval:

- Implement a simpler, streamlined permitting system for the hunting program. This system will require less administrative time, but will still provide staff with information about the hunt. It will utilize Office of Management and Budget (OMB) approved hunt surveys, and may be run with the State licensing system.

- Modify "no rifle hunting zones" on the refuge hunt map to open additional refuge lands to rifle hunting (see map 4-2).

- Provide a shuttle service to facilitate deer removal during the first week of gun season. Shuttles will carry deer in and out of areas along Middle Valley Trail and Camp 70 Loop trail. A stream crossing along Middle Valley Trail (either Sand Run or Glade Run) will be made stable for ATV traffic. Staff and volunteer hunters will establish and coordinate the shuttle service, plan the routes, schedule pick up times, and publicize the service throughout the hunting community. Success of this program will be evaluated based on anticipated increased hunter pressure and harvest from the center of the refuge. Modification or cessation of the program are options should it fail to meet the refuge's deer management goals.

- Open the Beall gate to allow hunters access to North Beall Road by licensed vehicle (only cars and trucks, no ATVs). Vehicles will follow the gravel road to the north, traveling an additional 0.8 mile towards the interior of the Main Tract, which is the 9,176-acre tract of land in the northern part of the refuge. Continued maintenance on the gravel road will be required.

- Close the Research Natural Area to all hunting according to Service policy, except for a deer management hunt.

- Request hunter participation in cottontail rabbit identification through collection of refuge harvested cottontail skulls. Work with the WVDNR for identification of eastern and Appalachian cottontails harvested on refuge lands.

- Provide outreach and education to promote understanding of the impacts of overabundant deer. This could include a section in the hunt brochure, a fall Visitor Center exhibit and a traveling exhibit.

- Gather deer population data and work with WVDNR, surrounding landowners, hunt clubs and other partners to reduce the deer herd in Canaan Valley by encouraging cooperative, managed deer hunts.

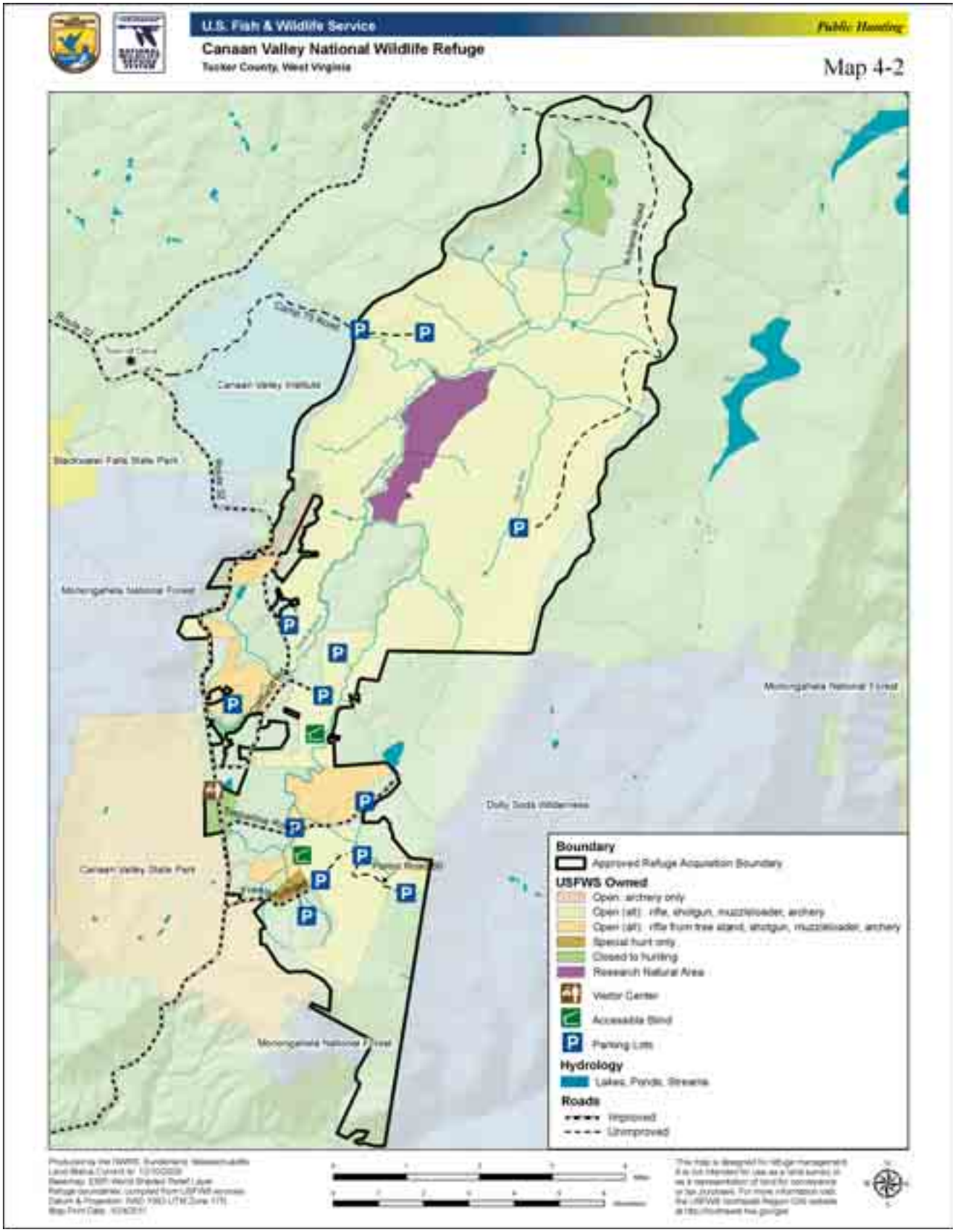
- Work with WVDNR to improve reporting on hunter harvest on refuge lands.

Within 5-10 years of CCP approval:

- Work with the State to permit special antlerless hunts on the refuge.

- Work with the State legislature and State representatives more closely on deer related issues, solutions, and legislative proposals.

- Require a special use permit for rabbit hunting.


U.S. Fish & Wildlife Service
Public Hunting
Canaan Valley National Wildlife Refuge
Tucker County, West Virginia
Map 4-2
Canaan Valley Institute
Blackwater Falls State Park
Monongahela National Forest
Dolly Sods Wilderness
Canaan Valley State Park
Boundary
Approved Refuge Acquisition Boundary
USFWS Owned
Open: archery only
Open (all): rifle, shotgun, muzzleloader, archery
Special hunt only
Closed to hunting
Research Natural Area
Visitor Center
Accessible Blind
Parking Lots
Hydrology
Lakes, Ponds, Streams
Roads
Unimproved

Throughout the Life of the CCP:

- Provide quality, safe, compatible hunting opportunities according to State regulations and seasons through a refuge permit system.
- Continue to operate under the 2007 Amended Refuge Hunt Plan (USFWS, 2007c).
- Allow night hunting for raccoon.
- Offer a refuge hunt program that follows State of West Virginia seasons and regulations. The exception is that we do not allow hunting from the end of February through the beginning of September, except for spring gobbler season. Hunters are required to obtain a refuge permit prior to hunting on the refuge.
- Allow the use of hunting dogs per State regulations and in season for bear, raccoon, grouse, woodcock, and waterfowl. Up to six dogs per hunting party are allowed for bear hunting and up to four dogs for raccoon. Hunt dogs are allowed off-leash.
- Maintain two accessible hunt blinds. Maintain a reservation system for the blinds where the maximum stay is one week. If the demand for accessible hunt blinds exceeds those we provide, we will implement a lottery system and reduce reservation time.
- Limit the number of hunt permits if data shows a need to do so to preserve the quality of the hunt.
- Work with adjacent land managers and the WVDNR to encourage cooperative, managed deer hunts.
- Provide parking in designated areas for hunters.

Objective 4.2 (Fishing)

Within 5 years of CCP approval, provide fishing opportunities such that 80 percent of anglers report having a high-quality fishing experience on the refuge.

Rationale

In this management action we will officially open the refuge to fishing by amending 50 CFR 32.68. We will allow fishing according to State seasons and regulations. Fishing is one of the six priority public uses to receive enhanced consideration on national wildlife refuges according to the 1997 Refuge Improvement Act. Fishing is also an historical and traditional use in the Canaan Valley area, and it is a popular activity locally, State-wide and throughout the Refuge System. Fishing promotes an understanding and appreciation of natural resources and their management on all lands and waters in the Refuge System. Refuge-specific fishing regulations will ensure fish community health and demographic structure for sustainable populations.

The Refuge Improvement Act stipulates that "In administering the System, the Secretary shall…ensure that the biological integrity, diversity, and environmental health of the System are maintained for the benefit of present and future generations of Americans…" One of several Service policies generated from that Act is contained in the Service Manual: 601 FW 3, "Biological Integrity, Diversity, and Environmental Health." Part 3.14(f) of that policy states…"We do not introduce species on refuges outside of their historic range or introduce a species if we determine they were naturally extirpated, unless such introduction is essential for the survival of the species and prescribed in an endangered species

recovery plan, or is essential for the control of an invasive species and prescribed in an integrated pest management plan." In the spirit of these stipulations, fisheries management on the refuge will focus on supporting self-sustaining habitats and native or naturalized species populations. Stocking native fish will be considered in cooperation with State partners and hatcheries in order to maintain a healthy and balanced ecosystem.

Strategies
Within 0-5 years of CCP approval:
- Officially open the refuge to fishing by submitting an opening package for fishing. As part of this process, we developed a compatibility determination in conjunction with the draft CCP/EA. That compatibility determination is included in the final CCP, as part of appendix B. The remaining components of the fishing package include a signed Finding of No Significant Impact for the final CCP, a published a final regulation, a revised 50 C.F.R. § 32.68, and a fishing plan.

- Assist partners in conducting creel and angler surveys.

- Work with the interagency fisheries group to develop a plan to maintain a quality fishery while restoring native fish populations within the refuge and the valley.

- Improve signage directing the public to designated approved fishing locations.

- Provide informational brochures and/or signs that promote awareness of refuge-specific and State fishing regulations.

Within 5-10 years of CCP approval;
- Educate anglers on the proper use and disposal of native and non-native bait, and on the benefits of wearing non-felt wading boots to reduce the risk of spreading unwanted aquatic invasives.

Throughout the Life of the CCP:
- Promote quality fishing opportunities according to State regulations.

- Allow fishing where approved public roads or public trails provide access to waterways or water bodies on the refuge.

- Maintain the Americans with Disabilities Act (ADA)-compliant fishing platform along Timberline Road and promote awareness of this new platform.

- Permit anglers to use parking areas provided near trailheads. Anglers may also park within a road's right of way unless otherwise restricted by the refuge or Department of Highway (DOH). The refuge has no special parking areas specifically for anglers.

- Participate in the County's annual fishing derby.

- Participate in the HOFNOD (Hooked On Fishing, Not On Drugs) Exposition.

Objective 4.3 (Wildlife Observation and Photography)

Within 5 years of CCP approval, at least 80 percent of refuge visitors engaged in wildlife observation and nature photography will report a high quality experience.

Rationale
Wildlife observation and photography are identified in the Refuge Improvement Act of 1997 as priority wildlife-dependent recreation activities. These

opportunities are provided daily on designated refuge roads and trails. This action will expand and enhance these opportunities in many different ways, as discussed below.

Increase trail connectivity and improve trail quality
Although the refuge provides 31 miles of roads and trails to visitors and an additional 10 miles of seasonal cross-country ski trails, many of these trails are isolated from each other. Visitors to Canaan Valley are looking for an outdoor adventure paired with wildlife observation and wildlife photography, similar to what they enjoy on neighboring public lands. Although our neighbors may have a different mission than the Service does, the refuge wanted to make an effort in this management action to connect some of the refuge's trails to provide visitors with the kind of wildlife-dependent recreation they are seeking. Connecting trails, both on and off refuge, allows people to travel longer distances for a more rigorous outdoor experience. Some people would also argue that becoming part of a long distance trail system offers a higher quality recreational experience. Longer, connected trails may also minimize the need for motorized vehicles and could contribute to improving air quality.

Ken Sturm/USFWS

Installing a bridge over Glade Run

Trail connections in this management action provide increased access for travel by foot, bicycle, and horse. However these uses are still zoned, restricting bicycling and horseback riding to some but not all of the refuge's trails. This helps to avoid user conflicts and to maintain the biological integrity of certain habitat types on the refuge.

Also in this management action we will improve the quality of the existing refuge trail system. Many refuge trails were created on access roads, rail grades or skid roads for logging. They were not necessarily designed for long term use and stability. The refuge will look at these old routes and seek ways to improve them. For example, we might make trails more stable, easier to traverse, easier to maintain, or more interesting. We also developed a list of criteria for determining

whether current or future trails are compatible with refuge purposes. These criteria are used to evaluate re-routed trail segments and the development of new trails. Two criteria on the list include: (1) Route provides an opportunity to view a variety of habitats and wildlife and (2) the route has a low potential for fragmenting habitat or disturbing wildlife populations. For a full list of the criteria, see the compatibility determination for wildlife observation, photography, environmental education, and interpretation in appendix B. The goal of this effort is not to close trails, but to make them more sustainable. We will also take advantage of opportunities to couple habitat restoration work with managing or creating new public use trails.

Also in this management action we will name the new trail that will connect Swinging Bridge to Cortland Road after Chris Clower. Chris was a career Service employee who supervised the West Virginia Field Office in Elkins from 1980 until he died of brain cancer in 1996. Chris was a conservationist who was committed to protecting wetlands across the State of West Virginia. He was an avid sportsman who loved woodcock hunting and he spent many falls combing the valley in search of this elusive game bird. So great was his love for the valley that his ashes were scattered there after he died. Chris was an integral member of the Canaan Valley Task Force, a group of Federal agencies, local businesses, and conservation organizations who met regularly to discuss how to protect the wetlands of Canaan Valley. In the end, the group agreed that creating a national wildlife refuge would best accomplish that task. Chris, who was also a veteran of the Marines and was injured in Vietnam, was instrumental in garnering public support for the Canaan Valley refuge even before it was created. During the 1980's he worked with other Service employees to reach out to local community groups and organizations to explain the benefits of protecting wetlands and establishing a national wildlife refuge. Naming a public use facility after Chris will ensure that current and future visitors will not forget who he was and what he did for the valley's wetlands.

White Grass Ski Touring Center

White Grass Ski Touring Center (White Grass) operates about 10 miles of its commercial cross-country skiing and snowshoeing operation on the southern end of the refuge, which is also where Cheat Mountain salamander populations are located. Research related to the salamander has shown that logging roads and some heavily traveled hiking trails can serve as barriers to Cheat Mountain salamander movement and therefore can reduce genetic dispersal. Conditions related to blocking movements for salamanders appear to be related to increased temperature and humidity resulting from an open tree canopy as well as the removal of vegetation and leaf litter through public use activities creating bare soil conditions. The cross country ski trails that White Grass maintains are not used outside the ski season for public use and are not heavily traveled. Therefore excessive trampling resulting in the removal of litter and vegetation to create bare dirt surfaces does not occur on these trails. In addition, both Powderline and Three-Mile trails are narrow and have partial canopy cover providing shading and cooling effects to the trail surface.

The refuge will implement measures to improve habitat on these trails for the Cheat Mountain salamander. One method we plan is planting native trees on the edges of the trails to increase canopy cover. Increasing canopy cover will help improve leaf litter cover and decrease light penetration to the forest floor. The Powderline Trail and a section of Three-Mile Trail, cross known occupied Cheat Mountain salamander habitat. These trails are old logging roads and are groomed in the winter to a 4-ft. width. Maintenance during spring and fall includes the removal of fallen trees and branches, as regulated by a refuge special use permit. In 2009, the MNF initiated a study to design more effective road and trail

maintenance activities to benefit Cheat Mountain salamander populations (Pauley and Waldron 2008). We will consult closely with the USFS, Dr. Pauley and our Service Ecological Services Field Office to discuss the results and implications of this research to refuge trails. In the future, the refuge will also consider other options such as replacing trail segments with boardwalks to further facilitate salamander movement across trails. This action is one of the recommended management guidelines in the recovery plan for this species (USFWS 1991). Interpretive signs posted in the rehabilitated areas will highlight the habitat improvement work for the Cheat Mountain salamander.

Also in this final CCP, we will use a different and more updated process for permitting White Grass to operate some of its cross-country skiing and snowshoeing trails on refuge lands. Before the CCP, this use has occurred pursuant to an annual special use permit issued by the refuge to White Grass under specific conditions. Within five years of CCP approval, we will convert this special use permit to a concession contract, pursuant to Director's Order 139 and 50 C.F.R. 25.61. This Director's Order states that project leaders may use concession contracts to provide wildlife-dependent and other activities detailed in the National Wildlife Refuge System Improvement Act of 1997. This new process will require the refuge to prepare a prospectus and notify the public of available opportunities to operate a commercial concession on Federal land. Existing and previous concessionaires and any other interested parties will receive a copy of the public notice, making this a competitive process. We will conduct additional NEPA analysis if required.

Boating
Canoes and kayaks are popular means of accessing the Blackwater River and experiencing the refuge. Non-motorized boating provides visitors with different opportunities to participate in wildlife observation, photography and fishing. The primitive boat access sites at Timberline Road, Old Timberline Road, and at the Camp 70 Road pullout facilitate this use. In this management action we will further facilitate this use by improving current access sites.

Delta 13 Road/Camp 70 Loop
This road is currently an open, but unmaintained public road and is in major disrepair. It leads to a loop trail open to pedestrian travel, biking, and horseback riding. There is interest from the community and stakeholders to keep Delta 13 and the connecting loop open as a trail for pedestrians, biking, horseback riding, and vehicles.

The refuge will work with WV Department of Highway (WVDOH) to develop a plan for improving this roadway for access by pedestrians, biking, horseback riding, and vehicles. The road will be improved from the refuge boundary to the northern portion of the loop, where it will end with a parking lot and a hardened overlook. The remainder of this road, starting with the southern portion of the loop and heading east, will be abandoned and maintained as a trail for pedestrian, biking, and horseback riding only.

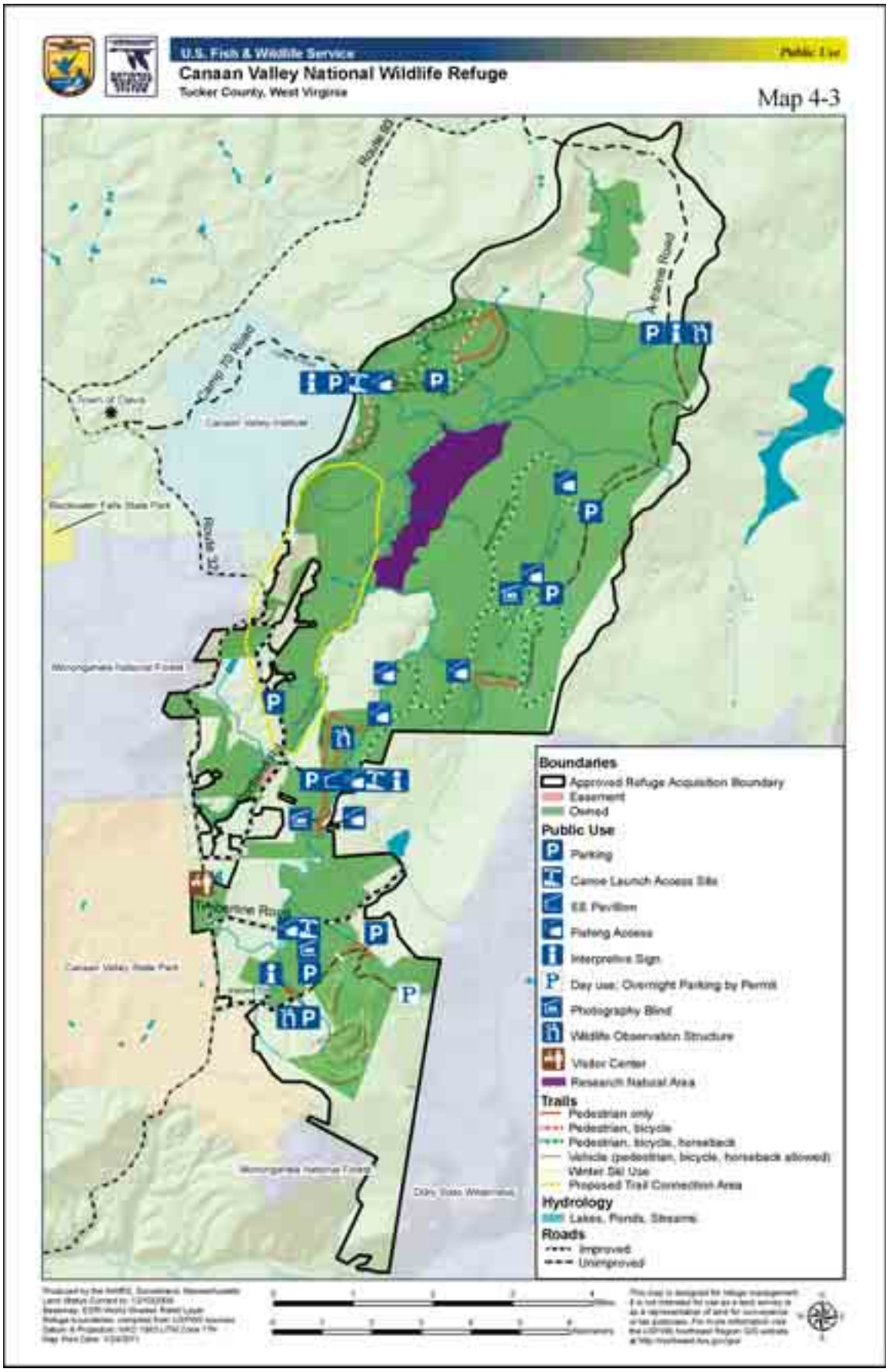
Once plans for the improved road and overlook are finalized, refuge staff will initiate the necessary environmental review and compliance process. Implementation of the plan can only begin when that process is complete, and when the refuge gains jurisdiction over the road.

In the interim, we will establish the width of the State's right of way on Delta 13/ Camp 70 Loop. Our concern is that many vehicles drive well outside the State right of way and onto refuge land in order to avoid the deep, water-filled ruts in the main road, thus expanding the area that is affected by vehicle traffic. Once

we identify the boundaries for the right-of-way we can mark them so that vehicles will be prohibited from going outside the right-of-way and destroying additional wildlife habitat.

Freeland Tract
The Freeland tract will be closed to public hunting, fishing, and walking with dogs, to promote a quality wildlife observation/education experience without other competing public uses. However, due to the refuge's concern with deer impacts to plant communities, particularly the rare conifer wetland community on the Freeland Tract, we will permit special hunts. These hunts may include youth hunts and a special hunt for the physically disabled. We may also permit limited open hunts during the regular season should browse damage indicate that closure of this tract has exacerbated deer damage. Decisions on types of hunts permitted on the Freeland Tract will be made annually and may include opening up this tract to one week of public hunting while closing it down to other public uses.

Strategies
Within 0-5 years of CCP approval:
- Maintain the accessible boardwalk loop on Freeland Trail.
- Continue to allow visitors to walk with dogs on refuge trails, except on the Freeland tract trails, but leashes must be no longer than 8 feet. For hunting dogs see hunt regulations.
- Convert the special use permit for commercial cross-country skiing and snowshoeing on the refuge to a concession, pursuant to Director's Order 139 and 50 C.F.R. 25.61. Conduct additional NEPA analysis if required.
- Construct an interpretive kiosk, parking area, and viewing platform on A-frame Road at the beginning of the refuge boundary.
- Allow overnight parking by special use permit on Forest Road 80 for visitors accessing and camping in Dolly Sods. Camping on the road or anywhere on the refuge is prohibited.
- Revegetate edges of the Powderline Trail and part of Three-Mile Trail to improve habitat for Cheat Mountain salamanders.
- Increase monitoring to determine how Cheat Mountain salamanders are using the White Grass trails that transect known salamander habitat. Implement other conservation measures, such as raising sections of the trails or installing diverters under the trails, if future research finds these actions beneficial. Continue monitoring to determine whether the animals are using this infrastructure to move under the trails.
- Close the Freeland Tract to public hunting (except for special deer hunts), fishing, and walking with dogs, to provide additional, high-quality opportunities for wildlife viewing and study.
- Coordinate with CVI and other partners to connect the Swinging Bridge Trail to Cortland Road. Map 4-3 illustrates the general area where we believe this connection can be made, however this proposed trail will require further NEPA analysis and public review before a final route is selected.
- Pursue transfer of the Beall Bridge and the adjoining property to the Service.


U.S. Fish & Wildlife Service
Canaan Valley National Wildlife Refuge
Tucker County, West Virginia
Map 4-3
Boundaries
Approved Refuge Acquisition Boundary
Easement
Owned
Public Use
Parking
Canoe Launch Access Site
Fishing Access
Interpretive Sign
Day use; Overnight Parking by Permit
Photography Blind
Wildlife Observation Structure
Visitor Center
Research Natural Area
Trails
Pedestrian only
Pedestrian, bicycle
Pedestrian, bicycle, horseback
Vehicle (pedestrian, bicycle, horseback allowed)
Winter Ski Use
Proposed Trail Connection Area
Hydrology
Lakes, Ponds, Streams
Roads
Improved
Unimproved
Route 32
A-frame Road
Camp 10 Road
Town of Davis
Canaan Valley Institute
Blackwater Falls State Park
Route 32
Monongahela National Forest
Timberline Road
Canaan Valley State Park
Monongahela National Forest
Dolly Sods Wilderness

- Connect the Beall Trails to the Middle Valley Trails and allow access for bicycle, horse, and pedestrians.
- Identify boat access points on refuge brochures and maps.
- Work with White Grass to improve trail signs to ensure visitors stay on designated ski trails while on the refuge.
- Consider rerouting or modifying steep trails to make them more stable and to minimize erosion.
- Identify and mark the boundaries for the State's right-of-way on Delta 13/Camp 70 Road so as to prevent vehicles from driving on refuge lands.
- Work with WVDOH to develop a plan for improving Delta 13/Camp 70 for access by pedestrians, biking, horseback riding, and vehicles. Improve the road from the refuge boundary to the northern portion of the loop, where it will end with a parking lot and a hardened overlook. Maintain the remainder of the road as a trail for pedestrian, biking, and horseback riding only. Implement the plan only after all environmental review and compliance processes are complete, and only after the refuge gains jurisdiction over the road.

Within 5-10 years of CCP approval:

- Construct a photo/observation blind along the trail at the end of A-Frame Rd.
- Initiate discussions with the State park about connecting the refuge Visitor Center to Canaan Valley Resort State Park via a trail.
- Work with Tucker County Trails on a connection between the Camp 70 loop trail and Brown Mountain Overlook Trail. When that connection is made, permit bicycle and pedestrian access on the western portion of the Brown Mountain Overlook Trail only.
- Install kiosk and directional signs to direct visitors toward boat access points.
- If monitoring efforts and new research conclude that salamanders are not crossing the commercial cross-country ski trails that transect their habitat, work with the concessionaire to discuss closing or relocating the trails.

Within 10-15 years of CCP approval:

- Improve two launch sites for canoes, kayaks, or other hand-launched boats at Old Timberline Road and the Camp 70 Road pullout.

Throughout the life of the CCP:

- Coordinate with adjacent land owners to form a "Heart of the Highlands" trail system, which will promote trail connectivity among public and private lands throughout the region.
- Continue to maintain refuge roads and trails year-round for public use.
- Continue to work with the refuge's volunteer-based Adopt-a-Trail program to maintain and improve trail conditions, signage and blazing.
- Continue to maintain three unimproved boat launches at Timberline Road, Beall Tract, and Camp 70.
- Continue to permit limited off trail use by non-hunters through issuance of Special Use Permits. Permits will be issued on a case by case basis to ensure compatibility with the purposes of the refuge.

Objective 4.4 (Expansion of Environmental Education and Interpretation)

Provide environmental education and interpretation opportunities that foster stewardship of the environment and reflect refuge priorities, including managing for migratory birds, endangered species, and wetlands.

Rationale

With additional staff requested under this management action, the refuge will have the ability and resources to expand its environmental education and interpretation programs. This will allow the refuge to reach more teachers and students every year.

The visitor center facilitates the six priority public uses by providing a place for hunters to obtain permits, maps, and other information; for anglers to obtain information on river access and fishing locations; and for photographers and wildlife observers to obtain information on refuge trails. The visitor center also offers interpretive exhibits, videos, maps, and other resources for orienting visitors to Canaan Valley refuge and for educating them about the local ecosystem. Overall, the visitor center is a great asset to the refuge and community. Currently there is only one permanent staff member who is dedicated to operating the visitor center on a part-time basis. Although this staff member is supported by volunteers and seasonal staff, the refuge has struggled at times to keep the visitor center open just four days a week. In this management action we will focus staff and volunteer resources on keeping the visitor center open daily during peak seasons.

USFWS

Winter wildlife walk at White Grass Ski Touring Center

Supporting continued use of cross-country ski trails in partnership with White Grass permits expanded opportunities for environmental education and outreach during the winter months. Annually, 4,000-5,000 visitors ski on White Grass and refuge cross-country ski trails. As a condition of their special use permit, the staff at White Grass organizes winter trail walks for the public on a variety of refuge related and environmental topics. Typically, refuge staff members serve as the walk leader for one or two of these organized walks. Additionally the refuge has hired seasonal interns to develop and lead environmental education walks from the White Grass lodge. The use of the ski trails and White Grass operation contributes to the Service's mission for environmental education, interpretation, and wildlife observation and photography. Through this collaborative effort the refuge reaches hundreds of visitors each year during the winter, which is typically a time of low visitation.

The refuge will continue to encourage volunteers to take the lead with off-site programs. This enables the refuge staff to stay on the refuge and give priority to on-site programs.

Strategies

Within 0-5 years of CCP approval:

- Hire a new park ranger (GS 7/9) to support expanded programs and expanded Visitor Center hours.

- Double the number of students using the refuge annually.

- Develop a self-guided interpretive trail on the Freeland Tract.
- Present at least three off-site exhibits and three off-site programs annually, provided they are largely run by volunteers.
- Continue the partnership with White Grass Ski Touring Center to organize and conduct interpretive walks during winter months.
- Develop a professional traveling exhibit.
- Offer 30-50 on-site interpretive programs annually.
- Open the visitor center seven days per week during times of peak visitation and at least three days per week during the rest of the year, but more if we can obtain volunteers and students to help staff the center.
- Design and construct or re-allocate space to designate a larger meeting room in the vicinity of the visitor center. The room should have the capacity to accommodate 100 seated people.

Within 5-10 years of CCP approval:

- With additional staff, develop and present at least three environmental education teacher workshops annually, in line with State education standards.
- With additional staff, advertise and present 12 or more field trips for school children on the refuge per year. Develop programs for various primary and middle school age children (grade K-1, 2-3, 4-5, and 6-8) that teachers may request.
- Plan and construct an environmental education pavilion (with electricity if possible) and an attached storage room for equipment at the Beall Trail, near the Blackwater River. This will provide a sheltered area for groups that are studying outdoors. The design should include restrooms, either portable or permanent.
- Determine the need for a floating platform on the Blackwater River for student river studies and, if needed, design and construct platform.
- Expand the refuge's reach to communities that are within an hour's drive of the refuge, such as Elkins, Oakland, and/or Petersburg, by presenting six to eight programs in these school districts per year.
- Develop additional interpretive signage for other trails and kiosks.
- Develop one reception area for the combined needs of the office and visitor center. Responsibility for staffing the reception area will be shared by full and part time visitor services staff and by administrative staff whenever volunteers are not available.

Throughout the life of the CCP:

- Provide an annual "Wild School Day" refuge experience for local students.
- Work with Tucker County Connections on environmental education and other programs.
- Work with local Girl Scouts on their summer day camp off-refuge, as requested.

- Assist teachers and youth group leaders with refuge field trips upon request whenever staff is available.
- Provide a small curriculum library where teachers may find lessons to teach about the environment.
- Support the local area Master Naturalist training program, providing space indoors and outdoors and providing instructors.
- Work with colleges and other partners on service learning and forest restoration projects.
- Maintain interpretive signs at trail heads and along trails.
- Provide a variety of on-refuge indoor and outdoor public programs related to nature and the refuge.
- Work with the cross-country skiing concessionaire on winter interpretive programs and educational materials.
- Recruit work camper volunteers and local and part-time resident volunteers to help staff the visitor center.
- Provide visitor center exhibits that illustrate the variety of habitats on the refuge and in the local area in general, and that promote the mission of the Service and of the Refuge System.
- Continue to employ a STEP (Student Temporary Employment Program) student to help staff the visitor center on Saturdays.

GOAL 5 **Collaborate with partners to promote the natural resources of Canaan Valley and the mission of the National Wildlife Refuge System.**

Objective 5.1 (Outreach) Increase participation in events with local partners to advocate resource conservation and stewardship and to promote the mission of the Refuge System

Rationale
Public outreach will improve recognition of the refuge, the Refuge System, and the Service among neighbors, local leaders, conservation organizations, and elected officials, thus generating support for conservation in the region. An annual public open house will allow the refuge to present to the public the refuge's accomplishments and the public will have a chance to ask questions and make comments. This will also allow for regular, continual dialogue between the public and the refuge.

Strategies
- Participate in public lands working group.
- Participate in community outreach events such as HOFNOD and Forest Festival.
- Build working partnerships with NGOs and municipalities and through the Private Lands program at the West Virginia FWS Field Office.
- Continue to take interactive traveling exhibits to local festivals as time and staff permit.

- Hold an annual public open house, preferably in the fall.

Objective 5.2 (Communication)

Increase public awareness and attract visitors to Canaan Valley and the refuge through various forms of media, including local television, the Internet, newspapers, and promotional advertising.

Rationale

Good public relations depend on many factors. Important among these is open and continuing communication between the refuge and the public. Various means are available to refuge managers by which to communicate information effectively, such as contact with the public through refuge programs, news media interviews, news releases, and direct mailing. We will continue to facilitate communication with the community and stakeholders.

Strategies

- Continue to write news articles for the Parsons Advocate and Elkins Intermountain.
- Continue to write articles for the Timberdoodle (Friends of the 500th's newsletter).
- Continue to maintain web page.
- Investigate and utilize social media as appropriate and consistent with Service policy.

Chapter 5

Ken Sturm/USFWS

Black bear print

List of Preparers

- **Members of the Core Planning Team**
- **Assistance from Other Service Personnel**

Members of the Core Planning Team

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Ken Sturm/USFWS

Sundew (Drosera sp.) species of concern

Glossary (including list of acronyms)

- Glossary
- Acronyms

Glossary

accessibility — the state or quality of being easily approached or entered, particularly as it relates to complying with the Americans With Disabilities Act.

accessible facilities — structures accessible for most people with disabilities without assistance; facilities that meet UFAS standards; ADA-accessible [e.g., parking lots, trails, pathways, ramps, picnic and camping areas, restrooms, boating facilities (docks, piers, gangways), fishing facilities, playgrounds, amphitheaters, exhibits, audiovisual programs, and wayside sites].

aggregate — many parts considered together as a whole.

agricultural land — non-forested land (now or recently orchards, pastures, or crops).

alternative — a reasonable way to fix an identified problem or satisfy a stated need [40 CFR 1500.2] (see "management alternative").

appropriate use — a proposed or existing use on a refuge that meets at least one of the following three conditions:

1. the use is a wildlife-dependent one;
2. the use contributes to fulfilling the refuge purpose(s), the System mission, or goals or objectives described in a refuge management plan approved after October 9, 1997, the date the National Wildlife Refuge System Improvement Act was signed into law; or
3. the use has been determined appropriate as specified in the policy.

approved acquisition boundary — a project boundary that the Director of the U.S. Fish and Wildlife Service approves upon completion of the planning and environmental compliance process. An approved acquisition boundary only designates those lands which the Service has authority to acquire or manage through various agreements. The approval of an acquisition boundary does not grant the Service jurisdiction or control over lands within the boundary, and it does not make lands within the refuge boundary part of the National Wildlife Refuge System. Lands do not become part of the System until the Service buys them or they are placed under an agreement that provides for their management as part of the System.

aquatic — growing in, living in, or dependent upon water.

area of biological significance — see "special focus area."

best management practices — land management practices that produce desired results. [n.b. Usually describing forestry or agricultural practices effective in reducing non point source pollution, like reseeding skidder trails or not storing manure in a flood plain. In their broader sense, practices that benefit target species.]

biological diversity or biodiversity — the variety of life and its processes and includes the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur.

biological integrity — biotic composition, structure, and functioning at genetic, organism, and community levels comparable with historic conditions, including the natural biological processes that shape genomes, organisms and communities.

breeding habitat — habitat used by migratory birds or other animals during the breeding season.

categorical exclusion (CE, CX, CATEX, CATX) — pursuant to the National Environmental Policy Act (NEPA), a category of Federal agency actions that do not individually or cumulatively have a significant effect on the human environment [40 CFR 1508.4].

CFR — the Code of Federal Regulations.

community — an assemblage of plants occurring together at any point in time.

community type — a particular assemblage of plants and animals, named for its dominant characteristic.

compatible use — "The term 'compatible use' means a wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgment of the Director, will not materially interfere with or detract from the fulfillment of the mission of the System or the purposes of the refuge."–National Wildlife Refuge System Improvement Act of 1997 [Public Law 105-57; 111 Stat. 1253]

compatibility determination — a required determination for wildlife-dependent recreational uses or any other public uses of a refuge.

comprehensive conservation plan (CCP) — mandated by the Improvement Act, a document that provides a description of the desired future conditions and long-range guidance for the project leader to accomplish purposes of the refuge system and the refuge. CCPs establish management direction to achieve refuge purposes [P.L. 105-57; FWS Manual 602 FW 1.4].

concern — see "issue."

conservation — managing natural resources to prevent loss or waste. [n.b. Management actions may include preservation, restoration, and enhancement.]

conservation easement — a legal agreement between a landowner and a land trust (e.g., a private, nonprofit conservation organization) or government agency that permanently limits the uses of a property to protect its conservation values.

cool-season grass — introduced grass for crop and pastureland that grows in spring and fall and is dormant during hot summer months.

cooperative agreement — a usually long-term habitat protection action, which can be modified by either party, in which no property rights are acquired. Lands under a cooperative agreement do not necessarily become part of the National Wildlife Refuge System.

critical habitat — according to U.S. Federal law, the ecosystems upon which endangered and threatened species depend.

cultural resources — archaeological sites, historic structures, and historic landscapes

cultural resource overview a comprehensive document prepared for a field office that discusses, among other things, project prehistory and cultural history, the nature and extent of known cultural resources, previous research, management objectives, resource management conflicts or issues, and a general statement of how program objectives should be met and conflicts resolved. [An overview should reference or incorporate information from a field office's background or literature search described in section VIII of the Cultural Resource Management Handbook (cf. FWS Manual 614 FW 1.7).]

database a collection of data arranged for ease and speed of analysis and retrieval, usually computerized.

degradation the loss of native species and processes due to human activities such that only certain components of the original biodiversity persist, often including significantly altered natural communities.

designated wilderness area an area designated by Congress as part of the National Wilderness Preservation System [FWS Manual 610 FW 1.5 9draft)]

digitizing the process of converting maps into geographically referenced electronic files for a geographic information system (GIS).

disturbance any relatively discrete event in time that disrupts ecosystem, community, or population structure and changes resources, substrate availability, or the physical environment.

donation a citizen or group may wish to give land or interests in land to the Service for the benefit of wildlife. Aside from the cost factor, these acquisitions are no different than any other means of land acquisition. Gifts and donations have the same planning requirements as purchases.

easement an agreement by which landowners give up or sell one of the rights on their property (e.g., landowners may donate rights-of-way across their properties to allow community members access to a river). See "conservation easement."

ecological processes a complex mix of interactions among animals, plants, and their environment that ensures maintenance of an ecosystem's full range of biodiversity. Examples include population and predator-prey dynamics, pollination and seed dispersal, nutrient cycling, migration, and dispersal.

ecoregion a territory defined by a combination of biological, social, and geographic criteria, rather than geopolitical considerations; generally, a system of related, interconnected ecosystems.

ecosystem a natural community of organisms interacting with its physical environment, regarded as a unit.

ecotourism visits to an area that maintains and preserves natural resources as a basis for promoting its economic growth and development.

emergent wetland wetlands dominated by erect, rooted, herbaceous plants.

endangered species a Federally or State-listed protected species in danger of extinction throughout all or a significant portion of its range.

environmental education curriculum-based education aimed at producing a citizenry that is knowledgeable about the biophysical environment and its associated problems, aware of how to help solve those problems, and motivated to work toward solving them.

environmental health the composition, structure, and functioning of soil, water, air, and other abiotic features comparable with historic conditions, including the natural abiotic processes that shape the environment.

Environmental Assessment (EA) a public document that discusses the purpose and need for an action, its alternatives, and provides sufficient evidence and analysis of its impacts to determine whether to prepare an environmental impact statement or a finding of no significant impact (q.v.) [cf. 40 CFR 1508.9].

exemplary community type an outstanding example of a particular community type.

extirpated status of a species or population that has completely vanished from a given area but that continues to exist in some other location.

exotic species a species that is not native to an area and has been introduced intentionally or unintentionally by humans; not all exotics become successfully established.

Federal land public land owned by the Federal Government, including national forests, national parks, and national wildlife refuges.

Federally listed species a species listed either as endangered or threatenedunder the Endangered Species Act of 1973, as amended.

fee-title acquisition the acquisition of most or all of the rights to a tract of land; a total transfer of property rights with the formal conveyance of a title. While a fee-title acquisition involves most rights to a property, certain rights may be reserved or not purchased, including water rights, mineral rights, or use reservation (e.g., the ability to continue using the land for a specified time period, such as the remainder of the owner's life).

Finding of No Significant Impact (FONSI) supported by an environmental assessment, a document that briefly presents why a Federal action will have no significant effect on the human environment, and for which an environmental impact statement, therefore, will not be prepared [40 CFR 1508.13].

floodplain flat or nearly flat land that may be submerged by floodwaters; a plain built up or in the process of being built up by stream deposition.

focus areas see "special focus areas."

forested land land dominated by trees. For impacts analysis in CCP's, we assume all forested land has the potential for occasional harvesting; we assume forested land owned by timber companies is harvested on a more intensive, regular schedule.

forested wetlands wetlands dominated by trees.

fragmentation the disruption of extensive habitats into isolated and small patches. Fragmentation has two negative components for biota: the loss of total habitat area; and, the creation of smaller, more isolated patches of habitat remaining.

Geographic Information System (GIS) — a computerized system to compile, store, analyze, and display geographically referenced information (e.g., GIS can overlay multiple sets of information on the distribution of a variety of biological and physical features).

grassland — a habitat type with landscapes dominated by grasses and with bio-diversity characterized by species with wide distributions, communities being relatively resilient to short-term disturbances but not to prolonged, intensive burning or grazing. In such systems, larger vertebrates, birds, and invertebrates display extensive movement to track seasonal or patchy resources.

groundwater — water in the ground that is in the zone of saturation, from which wells and springs and groundwater runoff are supplied.

habitat fragmentation — the breaking up of a specific habitat into isolated and small patches. [n.b. A habitat area that is too small may not provide enough space to maintain a breeding population of the species in question.]

habitat conservation — protecting an animal or plant habitat to ensure that the use of that habitat by the animal or plant is not altered or reduced.

habitat — the place where a particular type of plant or animal lives. [n.b. An organism's habitat must provide all of the basic requirements for life, and should be free of harmful contaminants.]

historic conditions — the composition, structure, and functioning of ecosystems resulting from natural processes that we believe, based on sound professional judgment, were present prior to substantial human-related changes to the landscape.

hydrologic or flow regime — characteristic fluctuations in river flows.

hydrology — the science of waters of the earth: their occurrences, distributions, and circulations; their physical and chemical properties; and their reactions with the environment, including living beings.

impoundment — a body of water, such as a pond, confined by a dam, dike, floodgate, or other barrier, which is used to collect and store water for future use.

indigenous — native to an area.

interpretive facilities — structures that provide information about an event, place, or thing by a variety of means, including printed, audiovisual, or multimedia materials (e.g., kiosks that offer printed materials and audiovisuals, signs, and trail heads).

interpretive materials — any tool used to provide or clarify information, explain events or things, or increase awareness and understanding of the events or things (e.g., printed materials like brochures, maps or curriculum materials; audio/visual materials like video and audio tapes, films, or slides; and, interactive multimedia materials, CD ROM or other computer technology).

invasive species — a non-indigenous species whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

invertebrate — any animal lacking a backbone or bony segment that encloses the central nerve cord.

issue any unsettled matter that requires a management decision (e.g., a Service initiative, an opportunity, a management problem, a threat to the resources of the unit, a conflict in uses, a public concern, or the presence of an undesirable resource condition). [n.b. A CCP should document, describe, and analyze issues even if they cannot be resolved during the planning process (FWS Manual 602 FW 1.4).]

Land Protection Plan (LPP) a document that identifies and prioritizes lands for potential Service acquisition from a willing seller, and describes other methods of providing protection. Landowners within project boundaries will find this document, which is released with environmental assessments, most useful.

land trusts organizations dedicated to conserving land by purchase, donation, or conservation easement from landowners.

landscape an aggregate of landforms, together with its biological communities.

management alternative a set of objectives and the strategies needed to accomplish each objective [FWS Manual 602 FW 1.4.].

management concern see "issue" and "migratory nongame birds of management concern."

management opportunity see "issue."

management plan **a** plan that guides future land management practices on a tract. [N.b. In the context of an environmental impact statement, management plans may be designed to produce additional wildlife habitat along with primary products like timber or agricultural crops (see "cooperative agreement").]

management strategy a general approach to meeting unit objectives. [N.b. A strategy may be broad, or it may be detailed enough to guide implementation through specific actions, tasks, and projects (FWS Manual 602 FW 1.4).]

mesic soil sandy-to-clay loams containing moisture-retentive organic matter, well-drained (no standing water).

mission statement a succinct statement of the purpose for which the unit was established; its reason for being.

mitigation actions to compensate for the negative effects of a particular project (e.g., wetland mitigation usually restores or enhances a previously damaged wetland or creates a new wetland).

National Environmental Policy Act of 1969 (NEPA) 42 U.S.C. 4321 et seq. requires all Federal agencies to examine the environmental impacts of their actions, incorporate environmental information, and use public participation in planning and implementing environmental actions. Federal agencies must integrate NEPA with other planning requirements, and prepare appropriate NEPA documents to facilitate better environmental decision-making (cf. 40 CFR 1500).

National Wildlife Refuge System (System) all lands and waters and interests therein administered by the Service as wildlife refuges, wildlife ranges, wildlife management areas, waterfowl production areas, and other areas for the protection and conservation of fish and wildlife, including those that are threatened with extinction.

native — a species that, other than as a result of an introduction, historically occurred or currently occurs in a particular ecosystem.

native plant — a plant that has grown in the region since the last glaciation, and occurred before European settlement.

natural disturbance event — any natural event that significantly alters the structure, composition, or dynamics of a natural community (e.g., floods, fires, and storms).

non-consumptive, wildlife-oriented recreation — wildlife observation and photography and environmental education and interpretation (see "wildlife-oriented recreation").

non-native species — see "exotic species."

non point source pollution — a diffuse form of water quality degradation in which wastes are not released at one specific, identifiable point but from diffuse sources or a number of points or that are spread out and difficult to identify and control.

non-forested wetlands — wetlands dominated by shrubs or emergent vegetation.

Notice of Intent (NOI) — an announcement we publish in the Federal Register that we will prepare and review an environmental impact statement or an environmental assessment [40 CFR 1508.22].

Notice of Availability (NOA) — an announcement we publish in the Federal Register that we have prepared an environmental impact statement or an environmental assessment and that it is available for public review and comment.

objective — see "unit objective."

old fields — areas formerly cultivated or grazed, where woody vegetation has begun to invade. [N.b. If left undisturbed, old fields will eventually succeed into forest. Many occur at sites marginally suitable for crops or pasture. They vary markedly in the Northeast, depending on soil and land use and management history.]

outdoor education — educational activities that take place in an outdoor setting.

partnership — a contract or agreement among two or more individuals, groups of individuals, organizations, or agencies, in which each agrees to furnish a part of the capital or some service in kind (e.g., labor) for a mutually beneficial enterprise.

payment in lieu of taxes — cf. Revenue Sharing Act of 1935, Chapter One, Legal Context.

point source — a source of pollution that involves discharge of waste from an identifiable point, such as a smokestack or sewage-treatment plant outfall pipe.

population monitoring — assessing the characteristics of populations to ascertain their status and establish trends on their abundance, condition, distribution, or other characteristics.

prescribed fire — Any fire we ignite by management actions to meet specific objectives.

priority public use — a compatible wildlife-dependent recreational use of a refuge involving hunting, fishing, wildlife observation or photography, or environmental education or interpretation.

private land land owned by a private individual or group or non-government organization.

private landowner see "private land."

private organization any non-government organization.

protection mechanisms like fee title acquisition, conservation easements, or binding agreements with
landowners that ensure land use and land management practices will remain compatible with maintaining species populations at a site.

public individuals, organizations, and non-government groups; officials of Federal, State, and local government agencies; Native American tribes, and foreign nations–includes anyone outside the core planning team, those who may or may not have indicated an interest in the issues, and those who do or do not realize that our decisions may affect them.

public involvement offering an opportunity to interested individuals and organizations whom our actions or policies may affect to become informed; soliciting their individual opinions. We thoroughly study public input, and give it thoughtful consideration in shaping decisions about managing refuges.

public land land owned by the local, State, or Federal Government.

rare species species identified for special management emphasis because of their uncommon occurrence within a watershed.

rare community types plant community types classified as rare by any State program; includes exemplary community types.

refuge goals According to "Writing Refuge Management Goals and Objectives: A Handbook," refuge goals are "…descriptive, open-ended, and often broad statements of desired future conditions that convey a purpose but do not define measurable units."

refuge purposes According to the National Wildlife Refuge System Improvement Act of 1997, "The terms 'purposes of the refuge' and 'purposes of each refuge' mean the purposes specified in or derived from the law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum establishing, authorizing, or expanding a refuge, refuge unit, or refuge subunit."

refuge lands lands in which the Service holds full interest in fee title or partial interest like an easement.

restoration management of a disturbed or degraded habitat that results in the recovery of its original state (e.g., restoration may involve planting native grasses and forbs, removing shrubs, prescribed burning, or reestablishing habitat for native plants and animals on degraded grassland).

riparian referring to the interface between freshwater habitats and the terrestrial landscape.

riparian habitat habitat along the banks of a stream or river (see note above).

riverine within the active channel of a river or stream.

riverine wetlands generally, all the wetlands and deepwater habitats occurring within a freshwater river channel not dominated by trees, shrubs, or persistent emergents.

runoff water from rain, melted snow, or agricultural or landscape irrigation that flows over a land surface into a water body (see "urban runoff").

Service presence Service programs and facilities that it directs or shares with other organizations; public awareness of the Service as a sole or cooperative provider of programs and facilities

shrublands habitats dominated by various species of shrubs, often with many grasses and forbs.

species of concern species not Federally listed as threatened or endangered, but about which we or our partners are concerned.

species diversity usually synonymous with "species richness," but may also include the proportional distribution of species.

species richness a simple measure of species diversity calculated as the total number of species in a habitat or community.

State agencies natural resource agencies of State governments

State land State-owned public land

State-listed species see "Federal-listed species."

step-down management plan a plan for dealing with specific refuge management subjects, strategies, and schedules, e.g., cropland, wilderness, and fire [FWS Manual 602 FW 1.4.].

strategy a specific action, tool, technique, or combination of actions, tools, and techniques for meeting unit objectives.

succession the natural, sequential change of species composition of a community in a given area.

surface water all waters whose surface is naturally exposed to the atmosphere, or wells or other collectors directly influenced by surface water.

sustainable development the attempts to meet economic objectives in ways that do not degrade the underlying environmental support system. Note that there is considerable debate over the meaning of this term…we define it as "human activities conducted in a manner that respects the intrinsic value of the natural world, the role of the natural world in human well-being, and the need for humans to live on the income from nature's capital rather than the capital itself."

terrestrial living on land.

threatened species a Federally listed, protected species that is likely to become an endangered species in the foreseeable future over all or a significant portion of its range.

tributary a stream or river that flows into a larger stream, river, or lake, feeding it water.

trust resource — a resource that the Government holds in trust for the people through law or administrative act.[N.b. A Federal trust resource is one for which responsibility is given wholly or in part to the Federal Government by law or administrative act. Generally, Federal trust resources are nationally or internationally important no matter where they occur, like endangered species or migratory birds and fish that regularly move across State lines. They also include cultural resources protected by Federal historic preservation laws, and nationally important or threatened habitats, notably wetlands, navigable waters, and public lands like s national wildlife refuges.]

unfragmented habitat — large, unbroken blocks of a particular type of habitat.

upland — dry ground (i.e., other than wetlands).

upland meadow or pasture — upland pastures are areas maintained in grass for livestock grazing; upland meadows are hay production areas. [N.b. Meadows may occur naturally in tidal marshes and inland flooded river valleys or, more frequently, at upland sites where vegetation has been cleared and grasses planted. Eventually, meadows will revert to old fields and forest if they are not mowed, grazed, or burned. Grasses in both managed meadows and pastures usually are similar, but pasture herbs often differ because of selective grazing.]

urban runoff — water from rain, melted snow, or landscape irrigation flowing from city streets and domestic or commercial properties that may carry pollutants into a sewer system or water body

vernal pool — depressions holding water for a temporary period in the spring, and in which various amphibians lay eggs.

vision statement — a concise statement of what the refuge could achieve in the next 10 to 15 years.

watershed — the geographic area within which water drains into a particular river, stream, or body of water. A watershed includes both the land and the body of water into which the land drains.

wetlands — lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. These areas are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted to life in saturated soil conditions.

wilderness study areas — lands and waters identified by inventory as meeting the definition of wilderness and being evaluated for a recommendation they be included in the Wilderness

wilderness — see “designated wilderness area.”

wildfire — An unwanted wildland fire.

wildlife-dependent recreational use — a use of a national wildlife refuge involving hunting, fishing, wildlife observation or photography, or environmental education or interpretation (National Wildlife Refuge System Administration Act of 1966).

wildlife management manipulating wildlife populations, either directly by regulating the numbers, ages, and sex ratios harvested, or indirectly by providing favorable habitat conditions and alleviating limiting factors.

wildlife-oriented recreation recreational activities in which wildlife is the focus of the experience. According to the National Wildlife Refuge Improvement Act of 1997, "The terms 'wildlife-dependent recreation' and 'wildlife-dependent recreational use' mean a use of a refuge involving hunting, fishing, wildlife observation or photography, or environmental education or interpretation."

Acronyms

Acronym	Full Name
ACJV	Atlantic Coast Joint Venture
ADA	American Disabilities Act
AFBMO	Allegheny Front Bird Migration Observatory
AHMP	Annual Habitat Management Plan
AMJV	Appalachian Mountain Joint Venture
ARPA	Archaeological Resource Protection Act
AT	Appalachian Trail
ATV	All-terrain Vehicle
BCC	Birds of Conservation Concern
BCR	Bird Conservation Region
BMP	Best Management Practice
BRNA	Blackwater Research Natural Area
CAP	Contaminants Assessment Protocol
CASRI	Central Appalachian Spruce Restoration Initiative
CCP	Comprehensive Conservation Plan
CD	Compatibility Determination
CFR	Code of Federal Regulations
CFRNA	Central Fen Research Natural Area
CMS	Cheat Mountain salamander
CVNWR	Canaan Valley Natural Resource Refuge
CWCS	Comprehensive Wildlife Conservation Strategy
CWD	Chronic Wasting Disease
DEP	Department of Environmental Protection
DNR	Division of Natural Resources
EA	Environmental Assessment
EIS	Environmental Impact Statement
ENSP	Endangered and Nongame Species Program
EPA	Environmental Protection Agency
FHWAR	Fishing, Hunting, and Wildlife Associated Recreation
FmHA	Farmers Home Administration
FONSI	Finding of No Significant Impact
FR	Forest Road
FTE	Full-time Employee
FY	Fiscal Year
GIS	Geographic Information System

Acronym	Full Name
HMP	Habitat Management Plan
HSIMP	Habitat and Species Inventory and Monitoring Plan
IAFWA	International Association of Fish and Wildlife Agencies
IMPLAN	Impact Analysis for Planning
IPCC	Intergovernmental Panel on Climate Change
LWCF	Land and Water Conservation Fund
MBCF	Migratory Bird Conservation Fund
MOU	Memorandum of Understand
NABCI	North American Bird Conservation Initiative
NAWCA	North American Wetlands Conservation Act
NAWMP	North American Waterfowl Management Plan
NEPA	National Environmental Policy Act
NGO	Non-governmental Organization
NHPA	National Historic Preservation Act
NNL	National Natural Landmark
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRI	Nationwide Rivers Inventory
NWPS	National Wilderness Preservation System
NWR	National Wildlife Refuge
NWRS	National Wildlife Refuge System
NWSR	National Wild and Scenic River
NWSRS	National Wild and Scenic River System
OMB	Office of Management and Budget
ORV	Off-road Vehicle
OSHA	Occupational Safety and Health Administration
PIF	Partners in Flight
REAP	Rehabilitation Environmental Action Plan
Refuge Improvement Act	National Wildlife Refuge System Improvement Act of 1997
Refuge System	National Wildlife Refuge System
RNA	Research Natural Area
RONS	Refuge Operating Needs System
ROW	Right-of-way
SAMMS	Service Asset Maintenance Management System

Acronym	Full Name
SHC	Strategic Habitat Conservation
SHPO	State Historic Preservation Office
STEP	Student Temporary Employment Program
SUP	Special Use Permit
TCHHEP	Tucker County Highlands History and Education Project
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy
TPL	Trust for Public Land
USDA	United States Department of Agriculture
USDOI	United States Department of Interior
USFWS	United States Fish and Wildlife Service
USFS	United States Forest Service
USGS	U.S. Geological Survey
VHB	Vanesse Hangen Brustlin Inc.
VS	Visitor Services
WAP	Wildlife Action Plan
WCU	Wildlife Control unit
WIA	Wilderness Inventory Area
WV	West Virginia
WVCAP	West Virginia Conservation Action Plan
WVDEP	West Virginia Department of Environmental Protection
WVNFS	West Virginia Northern Flying Squirrel
WVDNR	West Virginia Division of Natural Resources
WVDOT	West Virginia Department of Transportation
WVFO	West Virginia Field Office
WSA	Wilderness Study Area
YCC	Youth Conservation Corps

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Appendix A

Kent Mason

American bittern

Species of Conservation Concern at Canaan Valley National Wildlife Refuge

Species of Conservation Concern at Canaan Valley National Wildlife Refuge

Table A.1. Resources of Concern for Canaan Valley NWR (See Table A.2 for bird species).

Species / Community	State Rank[1]	Global Rank[1]	Fed T&E[1,2]	WV WCAP[3]	USFS[1,4]
Plant communities					
Balsam Fir – Black Ash Swamp	S1	G1		H	
Balsam Fir – Oatgrass Swamp	S2	G2		H	
Balsam Fir – Winterberry Swamp	S1	G2		H	
Quaking Aspen Swamp	SNR	GNR		H	
Red Spruce – Heath Peat Woodland	S2	G2G3		H	
Red Spruce – Hemlock – Rhododendron Swamp	S2	G2?		H	
Red Spruce – Yellow Birch – Mannagrass Swamp	S2S3	G3		H	
American Bur-reed Marsh	S2	G2G3		H	
Beaked Sedge Fen	S2	G4G5		M	
Bluejoint Grass Wet Meadow	S2	G24G5		H	
Cottongrass Fen	S3	G3		M	
Goldenrod Wet Meadow	S3	GNR		H	
Lake Sedge Fen	S1	G4G5		M	
Nodding Sedge – Prickly Bog Sedge Seep	S2	G2		M	
Rice Cutgrass Marsh	S3	GNR		H	
Silvery Sedge Fen	S2	GNR		M	
Softstem Bulrush Marsh	S2	GNR		H	
Star Sedge Fen	S2	G2?		M	
Threeway Sedge Fen	S3	GNR		H	
Tussock Sedge Wet Meadow	S3	G4G5		H	
Woolgrass Wet Meadow	S3	GNR		H	
Blueberry – Bracken Fern Shrub Swamp	S3	GNR		H	
Bushy St. John's-wort Shrub Swamp	S3	GNR		H	
Chokeberry – Wild Raisin Shrub Peatland	S3	GNR		H	
Cranberry – Beakrush Peatland	S2	G2		H	
Meadowsweet Shrub Swamp	S3	GNR		H	
Silky Willow Shrub Swamp	S3	GNR		H	
Speckled Alder – Arrowwood Shrub Swamp	S3	GNR		H	
Speckled Alder Shrub Swamp	S3	G5		H	
Steeplebush Shrub Swamp	S2	GNR		H	
Red Spruce – Yellow Birch Forest	S2	G2		H	
Red Spruce – Hemlock – Beech Forest	S3	G3		H	
Red Spruce – Heath Rocky woodland	S1	G2		H	
Rough Sedge Seep	S3	G3		H	

Species / Community	State Rank[1]	Global Rank[1]	Fed T&E[1,2]	WV WCAP[3]	USFS[1,4]
Plants					
Abies balsamea (balsam fir)	S3	G5			
Betula papyrifera (paper birch)	S2	G5			
Botrychium lanceolatum var. angustisegmentum (lanceleaf grapefern)	S1	G5T4			FH (RFSS)[5]
*Botrychium matricariifolium*** (chamomile grapefern)	S2	G5			
Botrychium oneidense (bluntlobe grapefern)	S1	G4			F1 (RFSS)[5]
Carex aestivalis (summer sedge)	S2	G4			
Carex atherodes (wheat sedge)	S1	G5			
Carex bromoides (brome-like sedge)	S2	G5			
Carex canescens (silvery sedge)	S3	G5			
Carex comosa (longhair sedge)	S2	G5			
Carex emoryi (Emory's sedge)	S1	G5			
Carex lacustris (hairy sedge)	S2	G5			
Carex lasiocarpa (woollyfrruit sedge)	S1	G5			
Carex leptonervia (nerveless woodland sedge)	S1	G4			
Carex normalis (larger straw sedge)	S2	G5			
Carex projecta (necklace sedge)	S1	G5			
Carex suberecta (prairie straw sedge)	S1	G4			
Carex utriculata (beaked sedge)	S2	G5			
Carex vesicaria (inflated sedge)	S2	G5			
Coptis trifolia (goldthread)	S2	G5			
Cornus canadensis (bunchberry)	S3	G5			F3
Cuscuta rostrata (beaked dodder)	S2	G4			
*Cypripedium reginae*** (showy lady's slipper)	S1	G4			F1 (RFSS)[5]
Dalibarda repens (star violet)	S3	G5			
Drosera rotundifolia (roundleaved sundew)	S3	G5			
Eleocharis palustris (creeping spikerush)	S1	G5			
Equisetum fluviatile (water horsetail)	S2	G5			
Equisetum sylvaticum (woodland horsetail)	S1	G5			
Eupatorium pilosum (vervain thoroughwort)	S2	G5			
Euphorbia purpurea (glade spurge)	S2	G3			F1 (RFSS)[5]
Fraxinus nigra (black ash)	S2S3	G5			
Gaultheria hispidula (creeping snowberry)	S2S3	G5			
*Geum aleppicum*** (yellow avens)	S1	G5			

Species / Community	State Rank[1]	Global Rank[1]	Fed T&E[1,2]	WV WCAP[3]	USFS[1,4]
Geum rivale (purple avens)	S1	G5			
Glyceria grandis var. grandis (American mannagrass)	S2	G5			
Glyceria laxa (limp mannagrass)	S1	G5			
Gymnocarpium appalachianum ** (Appalachian oak fern)	S1	G3			F1 (RFSS)[5]
Hasteola suaveolens (sweet-scented Indian plantain)	S2	G3G4			F1 (RFSS)[5]
Juncus articulatus (jointed rush)	S2	G5			
Juncus biflorus (grass-leaved rush)	S1	G5			
Juncus filiformis (thread rush)	S2	G5			F1 (RFSS)[5]
Listera smallii ** (Small's twayblade)	S2	G4			
Lonicera canadensis ** (American fly-honeysuckle)	S2	G5			
Luzula bulbosa (bulbous woodrush)	S1	G5			
Lycopodiella inundata (bog clubmoss)	S2	G5			
Lycopodium lagopus (one-cone groundpine)	S1	G5			
Lygodium palmatum (climbing fern)	S3	G4			
Najas gracillima (slender water nymph)	S2	G5			
Oenothera pilosella ssp. Pilosella ** (evening primrose)	S2	G5			
Ophioglossum engelmannii ** (limestone adder's-tongue fern)	S1	G5			
Pedicularis lanceolata (swamp lousewort)	S2	G5			
Pogonia ophioglossoides ** (rose pogonia)	S2	G5			
Polemonium vanbruntiae (Jacob's-ladder)	S2	G3			F1 (RFSS)[5]
Rhamnus alnifolia (alder-leaf buckthorn)	S1	G5			
Rubus pubescens (dwarf raspberry)	SH	G5			
Sagittaria calycina var. calycina (long-lobe arrowhead)	S2	G5			
Salix discolor (glaucous willow)	S2	G5			
Saxifraga pensylvanica (Pennsylvania saxifrage)	S2	G5			F1
Schizachne purpurascens ** (false melic)	S1	G5			
Schoenoplectus purshianus (weakstalk bulrush)	S3	G4G5			
Scirpus atrocinctus (blackgirdle bulrush)	S3	G5			
Scirpus microcarpus (panicled bulrush)	S3	G5			
Sparganium androcladum (branchy bur-reed)	S1	G4			
Stachys aspera (gritty hedge-nettle)	S1	G4			
Taxus canadensis ** (Canada yew)	S2S3	G5			FP
Thelypteris simulata (bog fern)	S1	G4			
Torreyochloa pallida var. fernaldii (pale false mannagrass)	S2	G5			

Species / Community	State Rank[1]	Global Rank[1]	Fed T&E[1,2]	WV WCAP[3]	USFS[1,4]
Vaccinium macrocarpon (large cranberry)	S2	G4			
Vaccinium oxycoccos (small cranberry)	S2	G5			
Veronica scutellata (marsh speedwell)	S1	G5			
Viburnum lentago (nannyberry)	S1S2	G5			
Viburnum opulus var. americanum (cranberrybush)	S1	G5			
Viola appalachiensis (Appalachian blue violet)	S1	G3			F2 (RFSS)[5]
Zigadenus leimanthoides (bog camas)	S2	G4			
Birds (see separate table)					
Amphibians					
Cheat mountain salamander	S2	G2	T	✔	F2
Mammals					
West Virginia northern flying squirrel	S2	G5T2		✔	F2
Star-nosed mole	S2	G5		✔	F2
Fisher	S3	G5		✔	F3
Southern rock vole	S2	T3		✔	F2 (RFSS)[5]
Eastern small-footed bat	S1	G3		✔	F1 (RFSS)[5]
Indiana bat	S1	G2	E	✔	F1
Appalachian Cottontail	S3	G5			
Allegheny woodrat **	S3	G3		✔	F3 (RFSS)[5]
Southern water shrew **	S1	G5		✔	F1 (RFSS)[5]
Southern bog lemming	S2	G5		✔	F1
Meadow jumping mouse	S3	G5		✔	F2
Southern pygmy shrew	S2S3	G5T4		✔	F1
Reptiles					
Timber rattlesnake**	S3	G4		✔	F3 (RFSS)[5]
Northern coal skink**	S2	T5			F1
Mountain earth snake **	S1	G5T3T4		✔	F1
Butterflies					
Harris's checkerspot	S2	G4		✔	F1
Pink-edged sulfur	S1	T1?		✔	F1
Atlantis fritillary	S3	G5		✔	F3

Species / Community	State Rank[1]	Global Rank[1]	Fed T&E[1,2]	WV WCAP[3]	USFS[1,4]
Crayfish					
Crayfish *(Cambarus monongalensis)*	S3	G5		✔	
Odonates					
Sweetflag Spreadwing *(Lestes forcipatus)*	SH	G5			
Comet Darner *(Anax longipes)*	S1	G5		✔	
Hudsonian Whiteface *(Leucorrhinia hudsonica)*	S1	G5		✔	
Chalk-fronted Corporal *(Ladona julia)*	S2	G5		✔	
Delta-spotted Spiketail *(Cordulegaster diastatops)*	S2	G5		✔	
Swamp Spreadwing *(Lestes vigilax)*	S2	G5		✔	
White-faced Meadowhawk *(Sympetrum obtrusum)*	S2	G5		✔	
Northern Bluet *(Enallagma annexum)*	S2	G5			
Green-striped Darner *(Aeshna verticalis)*	S2	G5			
Northern Pygmy Clubtail *(Lanthus parvulus)*	S2	G4			
Southern Spreadwing (Lestes d.australis)	S2S3	G5T5			
Band-winged Meadowhawk *(Sympetrum semicinctum)*	S3	G5		✔	
Fish					
Redside dace *(Clinostomus elongatus)*	S1S2	G4		✔	
Brook trout *(Salvelinus fontinalis)*	S4	G5		✔	

*** species known or expected to occur in Canaan Valley, but have not yet been documented from Canaan Valley NWR.*

For an explanation of ranking systems see references following Table A.2.

[1]*See State, Global and Regional Ranking Systems on page A-9.*

[2]*Fed T&E: Federal Threatened (T) or Endangered (E) species.*

[3]*WV WCAP: West Virginia Wildlife Conservation Action Plan. Plant communities were listed in the WV WCAP, in Table 4 F-Habitats-30, based on their Conservation Priority. They are ranked as:*

H: high conservation priority
M: medium conservation priority

[4]*USFS: United States Forest Service. Rankings taken from Monongahela Forest Plan 2006, Table D-1. These species were chosen for detailed fine-filter analysis for the Monongahela National Forest plan revision. For further ranking information, see references following Table A.2.*

[5]*RFSS: Regional Forester's sensitive species for the Monongahela National Forest*

Table A.2. Resource of Concern for Canaan Valley NWR-Migratory Birds.

Common Name	Primary Habitat (from PIF Continental Plan)	USFWS BCC 2008 Region 5	PIF Area 12[1]	Draft BCR 28 (BCR Rule)[2]	Global Rank[3]	State NHP[4] Rank (Bold = WWWCAP SGNC[5])[3]	Migratory Species of Concern in Northern BCR's			
							BCR 8	BCR 12	BCR 13	BCR 14
Bay-breasted warbler	coniferous forest	✔			G5					✔
Cape May warbler	coniferous forest				G5			✔		✔
Northern saw-whet Owl	coniferous forest			f	G5	**S2B, S3N**				
Pine Siskin	coniferous forest				G5	**S1B, S4N**				
Red Crossbill	coniferous forest				G5	S1B				
Black-and-white Warbler	deciduous forest			f	G5					
Black-billed Cuckoo	deciduous forest			b	G5	**S3B**			✔	
Brown Creeper	deciduous forest				G5	**S3B,S4N**				
Cerulean Warbler	deciduous forest	✔	IA	a	G4	**S4B**		✔	✔	
Cooper's Hawk	deciduous forest				G5	**S3B, S4N**				
Eastern Wood Pewee	deciduous forest		IIA	f	G5	**S5B**				
Hooded Warbler	deciduous forest		IIB	d	G5					
Louisiana Waterthrush	deciduous forest		IIB	d	G5	**S5B**				
Northern Parula	deciduous forest		IIA		G5					
Northern Waterthrush	deciduous forest				G5	**S2B**				
Red-shouldered Hawk	deciduous forest				G5					
Rusty Blackbird	deciduous forest	✔			G4					
Scarlet Tanager	deciduous forest		IIB		G5					
Sharp-shinned Hawk	deciduous forest				G5	**S3B, S4N**				
Worm-eating Warbler	deciduous forest	✔	IA	c	G5	**S5B**				
Yellow-throated Warbler	deciduous forest			i	G5					
Bobolink	grassland				G5	**S2B**				
Clay-colored Sparrow	grassland				G5	S1B				
Eastern Meadowlark	grassland			f	G5					
Grasshopper Sparrow	grassland		IIC		G5	**S3B**				
Henslow's Sparrow	grassland	✔	IB	a	G4	**S1B**		✔	✔	
Northern Harrier	grassland				G5	**S1B, S3N**				
Sedge Wren	grassland	✔	IIC		G5	**S1B**				
Short-eared owl	grassland			X	G5	**S1B, S2N**				
Blackburnian warbler	mixed forest		IIC	f	G5	**S3B**				
Black-throated Blue Warbler	mixed forest		IIC	X	G5			✔		

Common Name	Primary Habitat (from PIF Continental Plan)	USFWS BCC 2008 Region 5	PIF Area 12[1]	Draft BCR 28 (BCR Rule)[2]	Global Rank[3]	State NHP[4] Rank (Bold = WVWCAP SGNC[5])[3]	Migratory Species of Concern in Northern BCR's			
							BCR 8	BCR 12	BCR 13	BCR 14
Broad-winged Hawk	mixed forest			i	G5					
Canada warbler	mixed forest	✔	IA	c	G5			✔	✔	✔
Downy Woodpecker	mixed forest			i	G5					
Nashville Warbler	mixed forest			X	G5	**S1B**				
Northern Goshawk	mixed forest			X	G5	**S1B, S1N**				
Ruffed Grouse	mixed forest			f	G5					
Swainson's Thrush	mixed forest				G5	**S1B**				
Wood Thrush	mixed forest	✔	IA	c	G5	**S5B**		✔		✔
Yellow-bellied Sapsucker	mixed forest			X	G5	**S1B, S3N**				
Yellow-rumped Warbler	mixed forest				G5	**S3B,S3N**				
Belted Kingfisher	Riparian			i	G5					
Alder Flycatcher	shrub/successional			X	G5	**S3B, S4N**				
American Woodcock	shrub/successional		IB	X	G5	**S4B, S4N**				
Barn Owl	shrub/successional				G5	**S1B, S1N**				
Brown Thrasher	shrub/successional		IIA	X	G5					
Eastern Towhee	shrub/successional		IIA	f	G5					
Field Sparrow	shrub/successional		IIA	b	G5	**S4B, S4N**				
Golden-winged Warbler	shrub/successional	✔	IA	a	G4	**S2B**		✔	✔	
Indigo Bunting	shrub/successional		IIA	i	G5					
Migrant loggerhead Shrike	shrub/successional		IIC	X	G5	**S1B, S2N**				
Northern Bobwhite	shrub/successional				G5	**S3B, S3N**				
Song Sparrow	shrub/successional			i	G5					
Vesper Sparrow	shrub/successional			X	G5	**S3B, S3N**	✔			
Whip-poor-will	shrub/successional	✔	IIA	b	G5	**S3B**			✔	
White-throated Sparrow	shrub/successional				G5					
Willow Flycatcher	shrub/successional		IB	J	G5	**S4B**				
American Bittern	wetland	✔			G4	**S1B, S1N**				
American Black Duck	wetland		IB		G5	**S2B, S4N**				
Bald Eagle	wetland				G5	**S2B, S3N**				
Solitary Sandpiper	Wetland	✔			G5					
Great Blue Heron	wetland				G5	**S2B, S4N**				
Green-winged Teal	wetland				G5	**SHB, S2N**				

Common Name	Primary Habitat (from PIF Continental Plan)	USFWS BCC 2008 Region 5	PIF Area 12[1]	Draft BCR 28 (BCR Rule)[2]	Global Rank[3]	State NHP[4] Rank (Bold = WVWCAP SGNC[5])[3]	Migratory Species of Concern in Northern BCR's			
							BCR 8	BCR 12	BCR 13	BCR 14
Hooded Merganser	wetland				G5	**S1B, S4N**				
Marsh Wren	wetland				G5	**S1B**				
Osprey	wetland				G5	**S2B, S2N**				
Pied-billed Grebe	wetland	✔			G5	**S2B, S4N**				
Sora	wetland				G5	**S1B, S1N**				
Spotted Sandpiper	wetland				G5	**S3B**				
Virginia Rail	wetland				G5	**S1B, S1N**				
Wilson's Snipe	wetland				G5	**S1B, S1N**				
Blue-gray Gnatcatcher	wetland – forested			i	G5					
Black Vulture					G5	**S3B, S4N**				
Chimney Swift				d	G5					
Peregrine Falcon				X	G4	**S1B, S2N**				

[1] *See Partners In Flight Ranking Definitions on page A-10.*

[2] *See BCR Rule Definitions on page A-11.*

[3] *See State, Global and Regional Ranking Systems on page A-9.*

[4] *State NHP: State Natural Heritage Program*

[5] *SGNC: Species in Greatest Need of Conservation*

State, Global and Regional Ranking Systems:

RANK TYPES	
F	Monongahela National Forest abundance rank.
G	Global abundance rank for the species.
S	State of West Virginia abundance rank.
T	Abundance rank for a subspecies or variety.
ABUNDANCE RANKING	
0	Not known to be present.
1	Extremely rare and critically imperiled. Typically 5 or fewer occurrences or <1,000 individuals.
2	Very rare and Imperiled. Typically 6 to 20 occurrences or 1,000 to 3,000 individuals.
3	Vulnerable. Either very rare and local throughout its range or found locally in a restricted range. Typically 21 to 100 occurrences or 3,000 to 10,000 individuals.
4	Common and apparently secure globally, though it may be rare in parts of its range, especially at the periphery. Typically more than 100 occurrences and >10,000 individuals.
5	Very common and demonstrably secure, though it may be rare in parts of its range, especially at the periphery. Typically considerably more than 100 occurrences and >10,000 individuals.
B	Breeding.
H	Possibly extirpated, known only from historical occurrences, but may be rediscovered..
NB	Non-breeding.
NR	Not Ranked.
p	Possibly could occur, but no documented occurrences.
Range Rank (e.g. S2S3)	Indicates uncertainty about the exact status. Rounded ranks are presented here when they were available.
U	Unrankable due to lack of information or conflicting information.
X	Believed extirpated. Little likelihood of rediscovery.
? (with no associated number)	Rank not yet developed.
? (with an associated number)	Rank uncertain.

Partners In Flight Ranking Definitions:

Tier I. High Continental Priority

Species on the *PIF Continental Watch List*, which are typically of conservation concern throughout their range. These are species showing high vulnerability in a number of factors, expressed as any combination of high global parameter scores, with AI ≥ 2 (so that species without manageable populations in the region are omitted). High level conservation attention warranted.

Tier IA. High Continental Concern + High Regional Responsibility

Species for which this region shares in major conservation responsibility; i.e., conservation in this region is critical to the overall health of this species. These species are on the *PIF Continental Concern List* with AI of 3 – 5 for this region, or a high percent population (above threshold in IIB).

Tier IB. High Continental Concern + Low Regional Responsibility

Species for which this region can contribute to rangewide conservation objectives where the species occurs. Species on the *PIF Continental Concern List* with AI of 2 for this region.

Tier II. High Regional Priority

Species that are of moderate continental priority (not on *Continental Watch List*), but are important to consider for conservation within a region because of various combinations of high parameter scores, as defined below; total of 7 parameter scores = ≥ 19.

Tier IIA. High Regional Concern

Species that are experiencing declines in the core of their range and that require immediate conservation action to reverse or stabilize trends. These are species with a combination of high area importance and declining (or unknown) population trend; total of 7 parameters ≥ 19, with AI + PT ≥ 8.

Tier IIB. High Regional Responsibility

Species for which this region shares in the responsibility for long-term conservation, even if they are not currently declining or threatened. These are species of moderate overall priority with a disproportionately high percentage of their total population in the region; total of 7 parameters ≥ 19, with AI = 5 or % population > threshold (see appendix C).

Tier IIC. High Regional Threats

Species of moderate overall priority that are uncommon in a region and whose remaining populations are threatened, usually because of extreme threats to sensitive habitats. These are species with high breeding threats scores within the region (or in combination with high nonbreeding threats outside the region); total of 7 parameters ≥ 19 with TB + TN > 6, or local TB or TN = 5.

Tier III. Additional Federally Listed

Species listed under the U.S. Endangered Species Act receive conservation attention wherever they occur.

Tier IV. Additional State Listed

Species on State or provincial endangered, threatened, or special concern lists that did not meet any of above criteria. These often represent locally rare or peripheral populations.

Tier V. Additional Stewardship Responsibility

Representative or characteristic species for which the region supports a disproportionately high percentage of the world population (see Appendix), but which did not meet any of the above criteria. Includes moderate- and low-scoring species for which the region has long-term stewardship responsibility, even if these species are not of immediate conservation concern.

Tier VI. Local Concern

Species of justifiable local concern or interest. May represent a geographically variable population or be representative of a specific habitat or conservation concern.

BCR Rule Definitions:

Priority Tier	Continental Concern	BCR Responsibility	BCR Concern	New Rule
Highest	HIGH	HIGH or MOD	HIGH	a
High	MODERATE	HIGH or MOD	HIGH	b
	HIGH	HIGH or MOD	MODERATE	c
	MODERATE	HIGH	MODERATE	d
Medium	HIGH or MOD	LOW *	HIGH	e
	LOW	HIGH or MOD	HIGH	f
	HIGH	LOW *	MODERATE	g
	MODERATE	MODERATE	MODERATE	h
	LOW	HIGH	MODERATE	i
	HIGH	HIGH or MOD	LOW	j
	MODERATE	HIGH	LOW	k
(Stewardship)	LOW	HIGH **	LOW	L
Unranked				X

**Non-breeding High Continental Concern species whose primary area of spring or fall migration overlaps the BCR*

***Sub-species of Regional Importance*

Table A.3. Additional migratory birds comprising >1 percent of all captures at AFBMO not listed in any plan.

SPECIES	PRIMARY HABITAT	SEASON	% OF TOTAL CAPTURES AFMBO
Ovenbird	deciduous forest	B,M	1.91
Red-eyed vireo	deciduous forest	B,M	1.13
Blue Jay	deciduous forest	B,M	1.93
Hermit Thrush	deciduous forest	B	6.30
Blackpoll warbler	coniferous forest	M	12.56
Dark-eyed Junco	coniferous forest	B,M	3.04
Black-throated Green Warbler	mixed forest	B,M	7.42
Tennessee Warbler	mixed forest	M	10.74
Golden-crowned Kinglet	mixed forest	M,B	2.88
Magnolia Warbler	mixed forest	M,B	4.19
Ruby-crowned Kinglet	mixed forest	M	1.76
Common Yellowthroat	wetland	B	2.55

Information used to compile the bird list for this section included an evaluation of the State, Federal and PIF lists which rank birds of concern. Birds known to occur on the refuge that are listed in the Species of Concern list had to meet at least one of the following criteria:

- Appear on any of the local planning documents as a species of concern (Monongahela National Forest Plan and the WVCAP)
- Appear on the USFWS Region 5 Birds of Conservation Concern List (2008)
- Appear on a PIF list either as a species of concern in Physiographic Area 12 or within (Draft) BCR 28.
- Appear on other BCR lists within the eastern flyway north of WV with documented occurrences during migration.
- Appear on PIF Continental Concern lists with documented occurrences during migration.

Many of the species are listed in several categories and ranking lists for species of concern while others are found in only one category. Important was the refuge's decision to evaluate the potential importance of migration habitat to those species of concern listed in BCR's to the north of West Virginia. Information from the Allegheny Front Bird Migration Observatory (AFBMO) was used to evaluate the abundance of migrating birds which fell into northern BCR's species of conservation concern.

Sources:

Refuge Status (Season of primary use of refuge habitats) B=breeding; M=migration; W=wintering (Refuge and local Data)

USFWSBCC: U.S. Fish and Wildlife Service Birds of Conservation Concern, Region 5 (USFWS 2008)

PIF–12: Partners in Flight priority breeding species for physiographic area 12 (Partners In Flight 2003).

Draft BCR 28: Partners in Flight priority breeding species for BCR 28 (Appalachian Mountains).

State NHP Rank: WVDNR 2007 (BOLD = Species in Greatest Need of Conservation –SGNC – WVWCAP 2006)

Allegheny Front Bird Migration Observatory (AFBMO) Percent of Total Capture (1958 - 2006) (% of # of captures)

Species of Continental Importance in Eastern Forest Avifaunal Biomes (from PIF Landbird Continental Plan 2004)

Appendix B

Ken Sturm/USFWS

Pink lady's slipper

Findings of Appropriateness and Compatibility Determinations

- Findings of Appropriateness
- Compatibility Determinations

Appendix B Contents

603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Canaan Valley National Wildlife Refuge

Use: Bicycling to Facilitate Priority Public Uses

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✔	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✔	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✔	
(d) Is the use consistent with public safety?	✔	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✔	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✔	
(g) Is the use manageable within available budget and staff?	✔	
(h) Will this be manageable in the future within existing resources?	✔	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✔	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✔	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✔ No ____.

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate ____ **Appropriate** ✔

Refuge Manager: Kenneth L. Johnson /Acting Date: 2/14/2011

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence:

Refuge Supervisor: _____ Date: 2/15/11

A compatibility determination is required before the use may be allowed.

603 FW 1
Exhibit 1
Page 2

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Canaan Valley National Wildlife Refuge

Use: Bicycling to Facilitate Priority Public Uses

NARRATIVE

Bicycling is an historical recreational use in Canaan Valley that occurred long before the refuge was created, and it has occurred on the refuge since its establishment. Many of the refuge's trails measure at least four miles round trip, making them accessible only to experienced hikers. Because bicycling provides easier and quicker access for many visitors who may not otherwise visit the refuge's habitats and other resources, bicycling therefore contributes to the public's understanding and appreciation of the refuge's natural and cultural resources.

Bicycling offers an opportunity to participate in wildlife-dependent recreation, thus contributing to Goal 4 of the Comprehensive Conservation Plan (CCP). By permitting bicycling, the refuge gives visitors an opportunity to get a closer view of the refuge's important wetlands and the wildlife that depend on these wetlands, thus contributing to the public's appreciation, understanding, and enjoyment of refuge habitats and wildlife, which also directly contributes to Goal 4 of the CCP. Refuge staff have often observed bicyclists with binoculars, cameras, and fishing poles. One refuge staff member even observed a hunter hauling out a deer with a bicycle during hunt season. This directly contributes to Goal 4, Objective 4.1 of the CCP, which strives to provide a high-quality hunting experience by facilitating deer removal from remote areas of the refuge.

Bicycling also contributes to the mission of the National Wildlife Refuge System because it enables visitors to enjoy wildlife-dependent recreation in remote areas of the refuge, thus enhancing understanding and appreciation of conservation, and benefitting present and future generations of Americans. As stated above, bicycling also contributes to the public's understanding of wetlands, thus contributing to the refuge's purpose of conserving wetlands.

Bicycle travel is limited to designated roads and trails, where road width can accommodate the safe passage of other users. Designated roads and trails also have sufficient viewing distance for bicyclists to detect the approach of other users and maneuver to accommodate them. Because of these accommodations, bicycling occurs concurrently and without conflict with other public uses including priority public uses. No complaints have been received.

Bicycling has therefore been found appropriate because it is consistent with the goals and objectives of the CCP and because it contributes to the public's understanding and appreciation of the refuge's natural resources.

603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Canaan Valley National Wildlife Refuge

Use: Cross-Country Skiing and Snowshoeing to Facilitate Priority Public Uses

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✔	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✔	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✔	
(d) Is the use consistent with public safety?	✔	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✔	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✔	
(g) Is the use manageable within available budget and staff?	✔	
(h) Will this be manageable in the future within existing resources?	✔	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✔	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✔	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✔ No _____ .

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____ **Appropriate** ✔

Refuge Manager: Kenneth K. Shea /Acting Date: 2/14/2011

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence:

Actg Refuge Supervisor: [signature] Date: 2/24/11

A compatibility determination is required before the use may be allowed.

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Canaan Valley National Wildlife Refuge

Use: Cross-Country Skiing and Snowshoeing to Facilitate Priority Public Uses

NARRATIVE

During much of the winter season when the ground is covered with snow, cross-country skiing and snowshoeing are often the only methods available for visitors to engage in priority public uses on the refuge, such as wildlife observation and photography. Because cross-country skiing and snowshoeing enable visitors to view the refuge's wildlife and habitat during a time of year when many visitors would not otherwise be able to use refuge trails, this use therefore contributes to the public's understanding and appreciation of the refuge's natural and cultural resources.

Cross-country skiing and snowshoeing also offer opportunities to participate in wildlife-dependent recreation, thus contributing to Goal 4 of the Comprehensive Conservation Plan (CCP). These uses gives visitors an opportunity to get a closer view of the refuge's many habitats during a time of year when visitors would not otherwise be able to do so. Therefore, this use also contributes to the public appreciation, understanding, and enjoyment of refuge habitats and wildlife, which also directly contributes to Goal 4 of the CCP. Refuge staff have often observed visitors skiing and snowshoeing with binoculars and cameras.

Cross-country skiing and snowshoeing also contribute to the mission of the National Wildlife Refuge System (Refuge System) because they enable visitors to enjoy wildlife-dependent recreation in remote areas of the refuge, thus enhancing understanding and appreciation of conservation, and benefitting present and future generations of Americans. As stated above, cross-country skiing and snowshoeing also contribute to the public's understanding of the refuge's role in wetland protection and wildlife management, thus contributing to the public's understanding of the Emergency Wetlands Resources Act (1986) and the Fish and Wildlife Act (1956), two purposes of the refuge.

One of the secondary goals of the Refuge System is to provide opportunities for the public to develop an appreciation for wildlife wherever those opportunities are compatible. Cross-country skiing and snowshoeing facilitate opportunities for viewing wildlife and habitats with relatively low levels of disturbance. Visitors participating in these activities are directly engaged in wildlife observation, education, and photography, all of which are identified in the National Wildlife Refuge System Improvement Act of 1997 as priority public uses of the Refuge System.

The very conditions that make cross-country skiing and snowshoeing possible (winter and snow cover) make most other public uses impractical. For this reason, cross-country skiing and snowshoeing occur concurrently and without conflict with other public uses. No complaints have been received.

Cross-country skiing and snowshoeing have therefore been found appropriate because they are consistent with the goals and objectives of the CCP and because they contribute to the public's understanding and appreciation of the refuge's natural resources.

603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Canaan Valley National Wildlife Refuge

Use: Commercial Cross-Country Skiing and Snowshoeing to Facilitate Priority Public Uses

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✔	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✔	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✔	
(d) Is the use consistent with public safety?	✔	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✔	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✔	
(g) Is the use manageable within available budget and staff?	✔	
(h) Will this be manageable in the future within existing resources?	✔	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✔	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✔	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✔ No _____ .

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____ **Appropriate** ✔

Refuge Manager: Kenneth K. Fleet /Acting Date: 2/14/2011

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence:

Refuge Supervisor: _____ Date: 2/15/11

A compatibility determination is required before the use may be allowed.

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Canaan Valley National Wildlife Refuge

Use: Commercial Cross-Country Skiing and Snowshoeing to Facilitate Priority Public Uses

NARRATIVE

White Grass Touring Center (White Grass) has operated a commercial cross-country skiing and snowshoeing operation in Canaan Valley since 1979. In 1999 the Service acquired the land on which this commercial operation exists. Since then, the refuge has been issuing a special use permit to White Grass so it can continue its operation on 10 miles of trails located on refuge lands. This activity was found to be compatible under a previous compatibility determination dated 1999.

During much of the winter season when the ground is covered with snow, cross-country skiing and snowshoeing are often the only methods available for visitors to engage in priority public uses on the refuge, such as wildlife observation and photography. Although non-commercial cross-country skiing and snowshoeing are available in other parts of the refuge, only the commercial-use trails are groomed for these activities. Since many visitors will only use groomed trails for these activities, this commercial use facilitates priority public uses for a large number of people who would otherwise be unable to view the refuge and its habitats in the wintertime. White Grass also facilitates trail access by plowing entrance roads and parking lots. Because commercial cross-country skiing and snowshoeing enable visitors to view the refuge's wildlife and habitat during a time of year when many visitors would not otherwise be able to use refuge trails, this use therefore contributes to the public's understanding and appreciation of the refuge's natural resources.

Cross-country skiing and snowshoeing gives visitors an opportunity to get a closer view of the refuge's many habitats during a time of year when visitors would not otherwise be able to do so. Therefore, these uses also contribute to the public appreciation, understanding, and enjoyment of Refuge habitats and wildlife, which directly contributes to Goal 4 of the Comprehensive Conservation Plan (CCP). Specifically, these uses contribute to Goal 4, Objective 4.3 of the CCP, which says the refuge will provide high-quality wildlife observation and nature photography experiences for visitors.

Furthermore, the majority of wildlife observation, education and interpretation activities that occur during the wintertime (outside the visitor's center) take place at White Grass. In fact, the refuge requires White Grass to provide environmental education programs regularly throughout the winter, thus reaching large numbers of a unique demographic during otherwise low visitation periods. The White Grass programs require minimal oversight from refuge staff and are always well received with typically 40 or more participants. This directly contributes to Goal 4, Objective 4.4 of the CCP, which says the refuge will provide environmental education and interpretation opportunities that foster stewardship of the environment. It also contributes to Goal 5 of the CCP, which encourages the refuge to collaborate with the local community and other partners on educational programs on the refuge and the surrounding landscape.

Cross-country skiing and snowshoeing also contribute to the mission of the National Wildlife Refuge System because they enable visitors to enjoy wildlife-dependent recreation in remote areas of the refuge, thus enhancing understanding and appreciation of conservation, and benefitting present and future generations of Americans.

Because of the limitations established for these activities, the seasonal timing, the level of use, and the additional stipulations identified in the special use permit, disturbance from allowing commercial cross-country skiing and snowshoeing will not have a major impact on wildlife or habitats.

Commercial cross-country skiing and snowshoeing occur on 10 miles of trails on the refuge. Concentrating this use all but eliminates conflicts with visitors who use trails elsewhere on the refuge for cross-country skiing, snowshoeing or other permitted public uses. No complaints have been received.

Cross-country skiing and snowshoeing have therefore been found appropriate because they are consistent with the goals and objectives of the CCP and because they contribute to the public's understanding and appreciation of the refuge's natural resources.

603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Canaan Valley National Wildlife Refuge

Use: Horseback Riding to Facilitate Priority Public Uses

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✔	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✔	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✔	
(d) Is the use consistent with public safety?	✔	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✔	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✔	
(g) Is the use manageable within available budget and staff?	✔	
(h) Will this be manageable in the future within existing resources?	✔	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✔	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✔	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✔ No _____ .

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____ **Appropriate** ✔

Refuge Manager: Kenneth K. Acting Date: 2/14/2011

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence:

Refuge Supervisor: _____ Date: 2/15/11

A compatibility determination is required before the use may be allowed.

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Canaan Valley National Wildlife Refuge

Use: Horseback Riding to Facilitate Priority Public Uses

NARRATIVE

Horseback riding is an historical, recreational use in Canaan Valley that occurred long before the refuge was created, and it has occurred on the refuge since its establishment. Many of the refuge's trails measure at least four miles round trip, making them accessible only to experienced hikers. Because horseback riding provides easier and quicker access for many visitors who may not otherwise visit the refuge's habitats and other resources due to the length of some refuge trails, this use therefore contributes to the public's understanding and appreciation of the refuge's natural and cultural resources.

Horseback riding also offers an opportunity to participate in wildlife-dependent recreation, thus contributing to Goal 4 of the Comprehensive Conservation Plan (CCP). By permitting horseback riding, the refuge gives visitors an opportunity to get a closer view of the refuge's important wetlands and the wildlife that depend on these wetlands, thus contributing to the public appreciation, understanding, and enjoyment of refuge habitats and wildlife, which directly contributes to Goal 4 of the CCP. Refuge staff have often observed horseback riders with binoculars and cameras. This use directly contributes to Goal 4, Objectives 4.3 and 4.4 of the CCP, which enhance opportunities for wildlife observation and photography, environmental education and interpretation.

Horseback riding also contributes to the mission of the National Wildlife Refuge System because it enables visitors to enjoy wildlife-dependent recreation in remote areas of the refuge, thus enhancing understanding and appreciation of conservation, and benefitting present and future generations of Americans. As stated above, horseback riding also contributes to the public's understanding of wetlands, thus building support for the refuge's purpose of conserving wetlands.

Horseback riding is limited to designated roads and trails, where the width can accommodate the safe passage of other users. Designated roads and trails also have sufficient viewing distance for horseback riders to detect the approach of other users and maneuver to accommodate them. Because of these accommodations, horseback riding occurs concurrently and without conflict with other public uses including priority public uses. No complaints have been received.

Horseback riding has therefore been found appropriate because it is consistent with the goals and objectives of the CCP and because it contributes to the public's understanding and appreciation of the refuge's natural resources.

603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Canaan Valley National Wildlife Refuge

Use: Vehicular Travel to Facilitate Priority Public Uses

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✔	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✔	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✔	
(d) Is the use consistent with public safety?	✔	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✔	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✔	
(g) Is the use manageable within available budget and staff?	✔	
(h) Will this be manageable in the future within existing resources?	✔	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✔	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✔	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✔ No _____ .

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____ **Appropriate** ✔

Refuge Manager: Kenneth K. Stein/Acting Date: 2/14/2011

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence:

Refuge Supervisor: _____ Date: 2/15/11

A compatibility determination is required before the use may be allowed.

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Canaan Valley National Wildlife Refuge

Use: Vehicular Travel to Facilitate Priority Public Uses

NARRATIVE

Since the establishment of the refuge in 1994, the public has been allowed to operate vehicles on two roads within the refuge boundary. Forest Road (FR) 80 (1.91 miles) provides vehicular access from Route 32 to U.S. Forest Service lands, including the Dolly Sods Wilderness Area. A-Frame Road, which is 4.79 miles, provides vehicular access to the northern portion of the refuge (Main Tract). This road is accessed from Highway 93. Public access is permitted to points where the roads are closed to protect refuge resources. Total vehicular access for these two roads is seven miles. Roads designated for vehicle use permit access to remote parts of the refuge and connect the refuge to neighboring public lands. These roads are necessary to facilitate permitted public uses and to meet other management objectives.

The majority of visitors access refuge trails by driving their personal vehicles to refuge trailheads, parking in a lot and then hiking, walking, bicycling, horseback riding, skiing, or otherwise using the designated trail for any of its permitted uses. Because vehicle access allows visitors to access trails for these public uses, and these trails allow visitors to view the refuge's habitats and other resources, vehicle access therefore contributes to the public's understanding and appreciation of the refuge's natural and cultural resources.

Furthermore, because vehicle access facilitates opportunities for participating in public uses, it contributes to Goal 4 of the Comprehensive Conservation Plan (CCP), which states that visitors of all abilities will enjoy opportunities for wildlife-dependent recreation. Providing access to wildlife-dependent recreation will enhance public appreciation, understanding, and enjoyment of refuge habitats and wildlife, also stated in Goal 4. Vehicle access plays a particularly important role in facilitating deer hunting. Many animals that are hunted are small enough to be carried out of the refuge, but deer are often too heavy to be carried or dragged for long distances. Therefore, deer hunters rely on vehicle access for hauling out deer. Vehicle access therefore contributes to all the objectives under Goal 4 of the CCP because it facilitates hunting, fishing, wildlife observation and photography, and environmental education and interpretation. Vehicle access also contributes to Goal 1 of the CCP, which states that the refuge will maintain and perpetuate the ecological integrity of the wetland complex by, for example, controlling the deer population. Without vehicle access, it would be almost impossible for deer hunters to be successful.

Permitting vehicle access also allows visitors to access neighboring public lands that permit wildlife-dependent uses. Vehicle access therefore also contributes to Goal 5 of the CCP because it provides connectivity for public use between the refuge and other public lands, a link that will be needed to work with partners on management and educational programs on the Refuge and on the surrounding landscapes.

Vehicle use also contributes to the mission of the National Wildlife Refuge System because it enables visitors to enjoy wildlife-dependent recreation throughout the refuge, thus enhancing understanding and appreciation of conservation, and benefitting present and future generations of Americans. By providing access to the refuge's unique resources, such as its wetlands, vehicle use also contributes to the public's understanding of wetlands, thus contributing to building support for the refuge's purpose of conserving wetlands.

To promote safe vehicle operation, to reduce the risk of vehicular collisions with other users and wildlife, and to enhance opportunities for wildlife observation, vehicle travel is subject to a maximum speed of 25 miles per hour. Roads designated for vehicle access are also designated for bicycle, horseback, and pedestrian travel.

Providing safe routes for wildlife-oriented activities is an important consideration for refuge roads. Safety considerations include ability of multiple modes of access to use a road without creating dangerous conditions, ability to maintain a road to allow safe use, and timing of various uses such as wildlife observation and hunting activities. Under the current level of use, routes open to vehicles are wide enough to allow multiple modes of access to occur without conflicts or safety concerns. Parking is available along refuge road shoulders on A-frame road, in turnouts, and at designated refuge parking lots. At the current level of use, these facilities are adequate to handle parking in an efficient and safe manner. Because of such stipulations as signage for traffic control, speed limits, and designated parking, vehicle use occurs concurrently and without conflict with other public uses including priority public uses. No complaints have been received.

Vehicle Use has therefore been found appropriate because it is consistent with the goals and objectives of the CCP and because it contributes to the public's understanding and appreciation of the refuge's natural resources.

603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Canaan Valley National Wildlife Refuge

Use: Public Beaver Trapping for Habitat Management Purposes

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✔	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✔	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✔	
(d) Is the use consistent with public safety?	✔	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✔	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✔	
(g) Is the use manageable within available budget and staff?	✔	
(h) Will this be manageable in the future within existing resources?	✔	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✔	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✔	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✔ No _____ .

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____ **Appropriate** ✔

Refuge Manager: Kenneth K. Jan /Acting Date: 2/14/2011

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence:

Refuge Supervisor: _____ Date: 2/15/11

A compatibility determination is required before the use may be allowed.

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Canaan Valley National Wildlife Refuge

Use: Public Beaver Trapping for Habitat Management Purposes

NARRATIVE

The primary areas targeted for beaver trapping will be locations where beaver flooding has caused or threatens to cause damage to refuge resources such as flooding of riparian forest habitat (or other sensitive plant communities) or refuge roads and trails. Seasonal inventory of beaver activity will be conducted by refuge biologists to determine locations for regulated beaver trapping. A majority of the use will occur on refuge tracts 50 and 100, also known as the Main Tract. Trapping will focus on the beaver ponds and corridors of the Blackwater River and its tributaries. Some trapping may also occur on wetland areas on or near Tract 200 (Freeland Tract) on the refuge's south end. The removal of surplus wildlife such as beaver for resource protection is authorized under 50 Code of Federal Regulations (CFR) 31.2(f), 31.14, and 31.16. Beaver trapping at Canaan Valley refuge is also a refuge management economic activity as described by 50 CFR 25.12.

Trapping addresses the need to preserve and protect plant communities of special interest on the refuge, such as the relict boreal vegetation in the Valley. These are the only plant communities on the Valley floor that resemble the original red spruce forests, and the refuge has a goal to protect these plant communities. Since beaver trapping on the refuge will aid in the protection of selected plant species and plant communities of concern, this use will contribute to Goal 1 of the Comprehensive Conservation Plan (CCP). Goal 1 states that the refuge will maintain and perpetuate the ecological integrity of the wetland complex to ensure a healthy and diverse wetland ecosystem providing a full range of natural processes, community types, and native floral and faunal diversity. Specifically, beaver trapping contributes to the CCP's forested wetlands objective under Goal 1 (Objective 1.2), which states that beaver trapping will be used to prevent prolonged flooding of high priority community types. Protecting wetlands also contributes to one of the legislative purposes of the refuge, the Emergency Wetlands Resources Act of 1986; 16 U.S.C. 3901(b), and to the purpose stated in the 1979 Environmental Impact Statement for the creation of the refuge, which said creating the refuge was necessary for protecting the integrity of Canaan Valley's ecosystem and wetlands.

Flooding is also a concern where beaver activity exists adjacent to refuge public use trails. Therefore beaver trapping also contributes to Goal 4 of the CCP, which ensures that visitors will have the ability to enjoy opportunities for wildlife-dependent recreation. Since most wildlife-dependent uses, such as wildlife observation, photography, environmental education, and interpretation, take place on refuge trails, beaver trapping will contribute to ensuring that refuge trails remain safe and open for these uses.

Implementation of a regulated trapping program on the refuge also affords a potential mechanism to collect survey and monitoring information, or contribute to research on beaver (and other wildlife) occurrence, activity, movement, population status, and ecology. Therefore beaver trapping further contributes to Goal 1, Objective 1.2 in the CCP, which states that the refuge will monitor beaver pond use and develop surveys focused on high priority locations to determine potential community loss through beaver activity.

A group of experienced trappers trained by the U.S. Fish and Wildlife Service can be used for their skills and local knowledge to perform or assist with valuable management or research functions. Trappers that participate in the refuge program will provide assistance with the implementation of structured management objectives, such as alleviation or reduction of wildlife damage to habitats and negative species interactions. Refuge trappers typically have a stake in proper habitat and wildlife conservation, and protection of the ecological integrity of the refuge so that their activity can continue. Accordingly, trappers are valuable assets to the refuge manager in terms of providing on-site reports concerning the fundamental status of habitat, wildlife, and refuge conditions. In this way, public beaver trapping is beneficial to the refuge's natural resources.

A regulated trapping program on the refuge also fosters the trappers' appreciation of wildlife interpretation, wildlife observation, environmental education, a greater understanding of ecological relationships, stewardship of natural resources, and inter-generational passage of the methodologies of renewable resource use. Trapping is an activity in which family members and friends often participate together and share joint experiences that broaden the sense of appreciation for natural resources and ecological awareness (Daigle et al. 1998).

This use is a self-limiting activity on the refuge because of the lack of public demand for trapping. Over the past six years, an average of only three trappers has participated in the public trapping program annually. We do not plan to significantly change the level of this use in the future. This low level of use ensures that trapping remains a low-impact tool for achieving the refuge's habitat management goals.

Public beaver trapping has therefore been found appropriate because it is a low-impact use, it is consistent with the goals and objectives of the CCP, and it is beneficial to the refuge's natural resources.

LITERATURE CITED

Daigle, J.J., R.M. Muth, R.R. Zwick, and R.J. Glass. 1998. Socio-cultural dimensions of trapping: a factor analytical study of trappers in six northeastern states. Wildlife Society Bulletin 26:614-625.

603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Canaan Valley National Wildlife Refuge

Use: Commercial Haying to Manage Grassland Habitat

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✔	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✔	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✔	
(d) Is the use consistent with public safety?	✔	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✔	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✔	
(g) Is the use manageable within available budget and staff?	✔	
(h) Will this be manageable in the future within existing resources?	✔	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✔	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✔	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✔ No _____ .

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____ **Appropriate** ✔

Refuge Manager: Kenneth K. Foster/Acting Date: 2/14/2011

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence:

Refuge Supervisor: _____ Date: 2/15/11

A compatibility determination is required before the use may be allowed.

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Exhibit 1
Page 2

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Canaan Valley National Wildlife Refuge

Use: Commercial Haying to Manage Grassland Habitat

NARRATIVE

Commercial Haying at Canaan Valley National Wildlife Refuge is a refuge management economic activity as described by 50 Code of Federal Regulations (CFR) 25.12. Commercial haying will be permitted in designated grassland management units of the refuge. The configuration of the units and the number of acres managed by haying may change from year to year. These units are currently:

Freeland Tract: 40 acres
Beall Tract: 116 acres
Harper Tract: 52 acres
Cooper Tract: 74 acres
Orders Tract: 33 acres

Because of the commercial viability of the hay crop from refuge lands, operators will be solicited through open advertisement. If more than one individual responds to the request, the refuge will select the individual randomly. The Service will charge the permit holder the fair market value of the standing hay crop as authorized by 50 CFR 29.5. The funds received will contribute to the U.S. Fish and Wildlife Service revenue sharing program with county government as described by 50 CFR 34.3(d).

Commercial haying removes vegetation from the field which is otherwise left using refuge brush hog mowing equipment. This rank cut vegetation builds a duff layer in the "understory" of the grassland which, over time, can make the grassland less suitable for target grassland nesting bird species. Periodic removal of the vegetation from the field helps reduce dense duff layer development and can be beneficial for nesting grassland bird species such as bobolinks and grasshopper sparrows. In this way, commercial haying contributes to Goal 3 of the CCP, which states that the refuge will provide and promote through active management a diversity of successional habitats, including grasslands, to sustain early successional and shrubland species. Additionally, commercial haying frees up staff equipment operators to conduct required management activities elsewhere on the refuge. This saves the refuge time and money which may be allocated to different projects. In that sense, this use benefits the refuge's natural and cultural resources.

Commercial haying has been found to be an appropriate use for helping to manage refuge grassland habitat. This use facilitates the management of refuge grassland habitat and is not only a reasonable method, but sometimes is a preferred method of cutting grasslands for nesting bird species. Therefore, commercial haying contributes directly to the achievement of the National Wildlife Refuge System mission and the specific refuge purposes, namely the management of wildlife resources (Fish and Wildlife Act of 1956; 16 U.S.C. §742f(a)(4)), and other management purposes for migratory birds (Migratory Bird Conservation Act,16 U.S.C. §715d).

Commercial haying has therefore been found appropriate because it is consistent with the goals and objectives of the CCP and because it benefits the refuge's natural and cultural resources.

603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Canaan Valley National Wildlife Refuge

Use: Maintenance and Use of NOAA Weather Station

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✔	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✔	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✔	
(d) Is the use consistent with public safety?	✔	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✔	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✔	
(g) Is the use manageable within available budget and staff?	✔	
(h) Will this be manageable in the future within existing resources?	✔	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✔	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✔	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✔ No _____ .

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____ **Appropriate** ✔

Refuge Manager: Kenneth K. Jones Acting Date: 2/14/2011

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence:

Refuge Supervisor: _____ Date: 2/15/11

A compatibility determination is required before the use may be allowed.

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Canaan Valley National Wildlife Refuge

Use: Maintenance and Use of NOAA Weather Station

NARRATIVE

The National Oceanic and Atmospheric Administration (NOAA) weather station was installed in 2000 on the Beall Tract. The purpose was to establish and use an air quality monitoring and research site by the National Oceanic and Atmospheric Administration (NOAA). NOAA will be using this site for climate research and monitoring. The use of climate data for research purposes fits into the description of 603 FW1 1.10(D), Specialized Uses. Specifically under 1.10 (D)(4) research is actively encouraged with partners. The establishment of a NOAA air quality monitoring and research site will result in negligible impacts to wildlife and will provide important climatological data. This information will be useful in determining the impacts of air and waterborne pollutants on the ecological communities in Canaan Valley and the mid-Atlantic Highlands.

Information generated by the NOAA research station has been useful for reports generated by the refuge and other research partners requiring comprehensive atmospheric data. Although the collection of climate data may not be used regularly at this time, a record of specific data related to climate, atmospheric deposition and levels of other pollutants will likely provide valuable data for evaluating the impacts of atmospheric pollution and climate change on the resources the refuge is charged to protect. This use is therefore beneficial to the refuge's natural resources. The collection of this data will also enable the refuge to better achieve the habitat management goals and objectives (goals 1, 2, and 3 and all their objectives) in the CCP, because this data will help the refuge staff make informed decisions. Furthermore, because this use could aid in the protection of fish and wildlife resources, it promotes the fulfillment of the refuge purpose of protecting fish and wildlife resources (Fish and Wildlife Act of 1956; 16 U.S.C. 742f (a) (4)).

Because of the limited access and restrictions on maintenance operations this use will not affect the refuge's ability to protect, conserve, and manage wildlife and their habitats (grassland species), nor will it impair existing wildlife-dependent recreational uses or reduce the potential to provide quality, compatible, wildlife-dependent recreation uses into the future.

The maintenance of the weather station has therefore been found appropriate because it is beneficial to the refuge's natural resources and it is consistent with the goals and objectives of the Comprehensive Conservation Plan.

603 FW 1
Exhibit 1

FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Canaan Valley National Wildlife Refuge

Use: Research Conducted by Non-Service Personnel

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	✔	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	✔	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	✔	
(d) Is the use consistent with public safety?	✔	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	✔	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	✔	
(g) Is the use manageable within available budget and staff?	✔	
(h) Will this be manageable in the future within existing resources?	✔	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	✔	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?	✔	

Where we do not have jurisdiction over the use ["no" to (a)], there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ["no" to (b), (c), or (d)] may not be found appropriate. If the answer is "no" to any of the other questions above, we will **generally** not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✔ No _____ .

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____ **Appropriate** ✔

Refuge Manager: Kenneth K. Stein /acting Date: 2/14/2011

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence.

If found to be **Appropriate**, the refuge supervisor must sign concurrence:

Refuge Supervisor: _____ Date: 2/15/11

A compatibility determination is required before the use may be allowed.

603 FW 1
Exhibit 1
Page 2

JUSTIFICATION FOR A FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Canaan Valley National Wildlife Refuge

Use: Research Conducted by Non-Service Personnel

NARRATIVE

Research by non-U.S. Fish and Wildlife Service (Service) personnel is conducted by colleges, universities, Federal, State, and local agencies, non-governmental organizations, and qualified members of the general public to further the understanding of the natural environment and to improve the management of the refuge's natural resources. Much of the information generated by the research is applicable to management on and near the refuge. In many cases research by non-Service personnel ensures the perception of unbiased and objective information gathering which can be important when using the research to develop management recommendations for politically sensitive issues. Additionally, universities and other Federal partners can access equipment and facilities unavailable to refuge staff for analysis of data or biological samples. This use is therefore beneficial to the refuge's natural and cultural resources. Research conducted by non-Service personnel will also enable the refuge to better achieve the habitat management goals and objectives (goals 1, 2, and 3 and all their objectives) in the CCP because this data will help the refuge staff make informed decisions. In addition, because this use could aid in the protection of fish and wildlife resources, it promotes the fulfillment of the refuge purpose of protecting fish and wildlife resources (Fish and Wildlife Act of 1956; 16 U.S.C. 742f (a) (4)). Research purposes fits into the description of 603 FW1 1.10(D), Specialized Uses. Specifically, research with partners is actively encouraged under 1.10 (D)(4).

The Service will encourage and support research and management studies on refuge lands that will improve and strengthen natural resource management decisions. The refuge manager will encourage and seek research relative to approved refuge objectives that clearly improves land management and promotes adaptive management. Priority research addresses information that will better manage the nation's biological resources and is generally considered important to: agencies of the Department of Interior; the Service; the National Wildlife Refuge System; and State fish and game agencies, and that addresses important management issues or demonstrates techniques for management of species and/or habitats.

The refuge will also consider research for other purposes which may not be directly related to refuge-specific objectives, but contributes to the broader enhancement, protection, use, preservation, and management of native populations of fish, wildlife, and plants, and their natural diversity within the region or flyway. These proposals must comply with the Service's compatibility policy.

If a research project occurs during the refuge hunting season, special precautions will be required and enforced to ensure the researchers' health and safety. If conducted according to refuge-specific stipulations (see compatibility determination for this use), this use will not affect the refuge's ability to protect, conserve and manage wildlife and their habitats, nor will it impair existing wildlife-dependent recreational uses or reduce the potential to provide quality, compatible, wildlife-dependent recreation uses into the future.

Research therefore has been found appropriate because it is beneficial to the refuge's natural and cultural resources and it is consistent with the goals and objectives of the CCP.

COMPATIBILITY DETERMINATION

USE:

Public Hunting

REFUGE NAME

Canaan Valley National Wildlife Refuge

DATE ESTABLISHED

August 11, 1994

ESTABLISHING AND ACQUISITION AUTHORITY(IES)

The establishment of Canaan Valley National Wildlife Refuge (refuge) was first approved in an Environmental Impact Statement (EIS) released on May 30, 1979. However, the U.S. Fish and Wildlife Service (Service) decided to await the outcome of litigation surrounding a proposed storage hydroelectric facility before pursuing any further action. The approval of the refuge was affirmed by the Service in a 1994 Final Environmental Assessment and Finding of No Significant Impact on July 11, 1994, which confirmed the adequacy of the previously approved 1979 EIS. The refuge was officially established when the first tract of land was acquired on August 11, 1994. The Service has acquired lands for the Canaan Valley refuge under the following authorities:

1. Fish and Wildlife Act of 1956 [16 U.S.C. 742f(a)(4)]
2. Emergency Wetlands Resources Act of 1986 [16 U.S.C. 3901b]
3. Migratory Bird Conservation Act of 1929 [16 U.S.C. 715d]

REFUGE PURPOSE(S)

The refuge was established to ensure the ecological integrity of Canaan Valley and the continued availability of its wetland, botanical, and wildlife resources to the citizens of West Virginia and the United States (USFWS 1979, 1994). Additional refuge purposes as derived from the legislative authorities are as follows:

(1) "... for the development, advancement, management, conservation, and protection of fish and wildlife resources..." (Fish and Wildlife Act of 1956; 16 U.S.C. 742f (a)(4));

(2) "... for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions." (Emergency Wetlands Resources Act of 1986; 16 U.S.C. 3901(b)); and,

(3) "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (Migratory Bird Conservation Act of 1929; 16 U.S.C. 715d).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans. National Wildlife Refuge System Improvement Act, 16 U.S.C § 668dd (a)(2).

DESCRIPTION OF PROPOSED USE

(a) What is the use? Is the use a priority public use?
The use is hunting according to State seasons and refuge regulations, including white-tailed deer, black bear, wild turkey, ruffed grouse, mourning dove, waterfowl, coot, rail, gallinule, coyote, Wilson's snipe, American woodcock, rabbit, hare, squirrel, red fox, grey fox, raccoon, bobcat, woodchuck, opossum, and striped skunk.

Hunting is a priority public use of the National Wildlife Refuge System (Refuge System). Under Service policy, hunting is an acceptable and traditional form of recreation, particularly in areas where it has been historically practiced.

(b) Where would the use be conducted?
Hunting will occur in designated areas on Service-owned lands. Map B-1 illustrates which areas are open for hunting. We will decide on a case-by-case basis whether to open newly acquired tracts for hunting.

The CCP calls for changes in rifle zones for deer hunting which will permit rifle hunting from tree stands in certain areas where it is not currently permitted. The CCP also calls for the closure of the Freeland Tract to hunting, except for special hunts as designated by the refuge manager.

(c) When would the use be conducted?
Hunting will occur according to West Virginia State seasons and refuge-specific regulations. Refuge regulations state that the refuge is closed to hunting between March 1st and August 31st of each year, except for the spring turkey season (50 Code of Federal Regulations (CFR) 32.68).

(d) How would the use be conducted?
Hunting will be conducted within the framework of West Virginia State regulations, and will be subject to refuge-specific regulations, according to the Federal regulations published in Title 50 of the CFR §32. A full description of the refuge hunt program can be found in the refuge Hunting Management Plan (USFWS 2007a) and the full National Environmental Policy Act analysis can be found in the hunting EA (USFWS 2007b). These documents are available in electronic form from the Region 5 Northeast Planning website (http://www.fws.gov/northeast/planning/), and in hard copy from the refuge.

The CCP calls for some modifications to the deer hunting program to increase the harvest of deer on the refuge. For example, the refuge will provide a shuttle service to facilitate the removal of white-tailed deer along the Middle Valley trail during the first week of deer gun season. This action will be taken only to increase deer harvest and to decrease density and reduce deer browse pressure on native plants and managed early successional habitat. All-terrain vehicles (ATV) will be operated only by refuge staff or ATV-trained refuge volunteers. The number of trips per day is anticipated to be three trips with two ATV's. Therefore a total maximum number of trips for a five day period (first week of deer gun season) will be 30. The route will be along only the Middle Valley Trail between Sand Run and A-Frame road. This section of trail is an old logging road which has been used as a public trail for bicycles, horse and pedestrian use since the acquisition of the Main Tract in 2002. The CCP also calls for an increase the amount of area open for the deer rifle season on the refuge.

Also new to the hunt program in the CCP is the closing of the Freeland Tract to regular public hunting, with the exception of refuge-authorized special public hunts such as youth or accessible hunts, consistent with State regulations. This tract consists of 86 acres of which 32 acres are managed grassland bound on two sides by a public road. A small stand of mixed fir, spruce, and hemlock consisting of approximately 9.4 acres is the main hunted area within this tract.

The Freeland Tract also contains a series of small beaver ponds fed by a bubbling spring which resists freezing during winter months. This spring provides waterfowl resting and feeding habitat when other areas on the refuge are frozen. Refuge outreach and education has focused on the Freeland Tract and an accessible boardwalk was constructed for observation, education, interpretation, and photography purposes. Additionally, the Freeland Tract is the most popular public access to the refuge and currently provides handicapped access via a boardwalk to the spring for priority public uses other than hunting. Closing this small area to hunting will provide visitors with important viewing areas for waterfowl and other waterbirds, especially during winter months when other areas on the refuge are either frozen or inaccessible due to snow. Closing this area will also reduce the impact of hunting on other priority public uses. Allowing refuge-authorized special hunts on this tract will help manage the deer herd and will create a unique and quality hunting experience for youth or disabled hunters.

(e) Why is this use being proposed?
Hunting is one of the six priority public uses as define by the National Wildlife Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997. If compatible, hunting is to receive enhanced consideration over other general public uses in refuge planning and management. Hunting can also be a valuable management tool to help keep wildlife populations in check and to protect refuge habitats from, for example, over-browsing by deer.

The Service encourages the development of hunting programs on national wildlife refuges when they are compatible with the refuge's legal purposes, biologically sound, affordable, properly coordinated with other refuge programs, and fit the Service description of a quality hunt. "Quality hunts" are defined as those which are planned, supervised, conducted, and evaluated to promote positive hunting values and ethics such as fair chase and sportsmanship. The Service strives to provide hunting opportunities on refuges which are superior to those available on other public or private lands, and to provide participants with reasonable harvest opportunities, un-crowded conditions, fewer conflicts among hunters, relatively undisturbed wildlife, and limited interference from, or dependence on, mechanized aspects of the sport (USFWS 1996).

AVAILABILITY OF RESOURCES

The hunt program is administered by the deputy refuge manager, resource impacts are monitored by the wildlife biologist, visitor use is monitored by park rangers, and maintenance and repair is performed by a heavy equipment operator. Additional resource protection is provided by a refuge law enforcement officer and deputy refuge manager.

Refuge vehicles are needed to effectively administer the use. The heavy equipment operator performs the maintenance and repair of refuge roads, parking lots, and associated structures. The refuge has heavy equipment including a motor grader, dump truck, bulldozer, backhoe, 4x4 farm tractor, bobcat, and front-end loader.

Annual costs associated with the administration of public hunting on the refuge are estimated below:

Review of program, administration and consultation with staff:

- Refuge Manager GS-13 for 5 days = $1,568.40 (at $39.21 per hour)

Road maintenance and repair, sign installation and kiosk construction and repair, maintaining parking areas, picking up and removing litter associated with hunting activities, and providing deer shuttle to Middle Ridge.

- WG-10 Equipment Operator for 10 work days = $2,725.60

Planning and supervising staff to monitor the use and its effects on environment and other visitors

- GS-11/12 Deputy Refuge Manager for 3 work days = $836.16

Resource protection, monitoring hunting activities and interactions with other users, visitor services, sign maintenance, litter removal

- GS-9 Law Enforcement Officer for 40 work days = $9,830.40

Monitoring habitat impacts from hunting activities, providing deer shuttle to Middle Ridge.

- GS-12 Wildlife Biologist for 15 work days (deer shuttle, data analysis and interagency coordination) = $5,512.80
- GS-11 Wildlife Biologist for 10 work days (deer shuttle, data analysis, reporting) = $2,972.80
- GS-7 Biological Sciences Technician for 5 work days =$1,004.40

Providing information to the public about public hunting on the refuge

- GS-11 Park Ranger for 10 work days = $3,530.40

Issuing hunting permits and maintaining database

- GS-4 Administrative Assistant for 130 work days = $18,844.80

Motor vehicle fuel/law enforcement patrols = $1,000.00

Heavy equipment fuel = $250.00

Kiosk construction, signs, printing maps and information = $2,500.00

Grand Total Estimated Costs = $50,367.36

FY 2009 Budget Allocations:

Employee Salaries and benefits = $624,039.53
Fixed costs (utilities, fuel, administrative) = $211,415.23
Base maintenance = $50,000
Discretionary Funds (maps, printing, etc.) = $62,243.32
Total Available Funds for FY 2009 = $947,698.08

The resources necessary to provide and administer this use at its current level and at the level described in the CCP are now available and we expect them to continue in the future subject to the availability of appropriated funds. Staff time associated with administration of this use is spent maintaining associated road infrastructure, collecting visitor use data, analyzing use patterns, monitoring potential impacts of the use on refuge resources, and providing information to the public about the use.

ANTICIPATED IMPACTS OF THE USE

Effects on Air and Water Quality:
Air quality and water quality impacts will be minimal and only due to refuge visitors' automobile emissions and run-off on roads and trails. These effects will not only come from hunters but from a majority of users of wildlife-dependent recreation on the refuge. The effects of these refuge-related activities, as well as other management activities, on overall air and water quality in the region will be negligible, compared to the effects from power plants, industrial centers, and non-refuge vehicle traffic. Therefore implementation of the proposed action will not impact adjacent landowners or uses beyond the constraints already implemented under existing State standards and laws.

Effects on Vegetation:
The physical effects on vegetation from hunting various game species on the refuge are expected to be minimal. The most destructive effects will result from vehicular traffic. ATVs will not be allowed on the refuge. Other vehicles are restricted to designated roadways. Hunter use is generally dispersed over large areas. Hunters will have little to no impact on the vegetation.

Positive, indirect effects on the vegetation will result from a reduction in the white-tailed deer population. The impacts of dense deer populations on forest regeneration and the composition and diversity of the herbaceous understory have been well documented (Tierson, et al., 1966; Behrend, et al., 1970; Tilghman, 1989) and observed in Canaan Valley. Opening the refuge to deer hunting will at least maintain the habitat as it is now and prevent further degradation due to overbrowsing. Well-managed hunting can effectively control deer and produce dramatic changes in the forest vegetation (Behrend, et al., 1970). The impact of deer hunting on the vegetation will be positive and result in better regeneration of forest canopy species and an increase in the diversity of the herbaceous understory. In summary, there will be few if any negative impacts from this use on the refuge's vegetation, but there will be beneficial impacts from the decrease of deer browse on the refuge's vegetation due to the decrease in the number of deer on refuge lands.

Possible negative cumulative impacts of the proposed activity include temporary trampling of vegetation and light soil erosion. Spring turkey season, lasting four weeks from mid-April to mid-May, could cause some trampling effects to growing plants especially in wet areas. There are few turkey hunters on the refuge. Most are hunting during the fall while other game species are in season. Other hunt seasons occur when the ground is either frozen, covered in snow or when plants are dormant. For these reasons, cumulative impacts to plant communities and soils are not likely to be significant during either the fall or spring hunting seasons.

Effects on Soils:
Soils can be compacted and eroded as a result of continued foot traffic. All soils associated with wetland habitats were rated as either high or very high in their potential for compaction (Bell 2002). Impacts to soils will likely be greater during the growing season due to the greater soil moisture content at that time of year. The Mauch Chunk-derived soil in Canaan Valley is particularly vulnerable to mechanical erosion when the vegetation has been removed (Rizzo 2002). If compacted, Mauch Chunk soils can facilitate rapid water runoff that accelerates erosion down slope (Rizzo 2002). Field investigations of trails in Canaan Valley have documented extensive damage displaying classic examples of the erosive nature of Mauch Chunk-derived soils after years of unregulated use. Although foot travel did not create highly erosive conditions in this soil type, lug soles of hiking boots could perpetuate the problem.

It is anticipated that minor impacts to soils will occur as a result of allowing hunting access on the refuge. Erosion potential will likely vary during the season based on soil moisture and temperatures. During much of the hunting season, soils may be frozen or covered in snow, thereby reducing the impacts greatly. At the current use level, impacts to soils (erosion, compaction) are not likely to be significant.

Effects on Hydrology:
Trails can affect the hydrology of an area, primarily through alteration of drainage patterns. Bartgis and Berdine (1991) note that roads and trails can divert water from their original drainage patterns in Canaan Valley. This can result in some drainages becoming dry while others accelerate erosion by being forced to carrying more water. Zeedyk (2002) documented many instances in Canaan Valley where existing trails were channeling water away from historic wetlands and, in some cases, causing erosion and sedimentation of bog and other wetland communities. These problems have profoundly if not irreversibly altered the extent, depths, characteristics and function of the wetlands on the Main Tract (Zeedyk 2002).The effects of these trails and roads were a direct result of vehicle use and road construction prior to the refuge's acquisition of the property. Since then measures have been taken to remediate erosion and sedimentation issues, particularly on trails that are open to public access. Furthermore, since the refuge has now acquired lands within the acquisition boundary, it can prohibit vehicle use and road construction in certain areas so as to minimize these types of impacts.

Because hunters are not restricted to utilizing only trails designed for other public use activities they may encounter areas which have not yet been restored to prevent continued erosion and subsequent sedimentation. However, these effects are considered minimal due to the fact that hunters are generally dispersed, which reduces repeated erosive actions on soils. Also, hunters are not permitted to use vehicles off designated refuge roads, and soils will be frozen during much of the hunt season, thus reducing the potential for erosion and downstream sedimentation.

Maintenance will be required to create adequate and proper drainage so that existing routes do not impact local hydrology. These impacts are not likely to be significant in relation to other public uses permitted on refuge trails. Off-trail foot traffic, if concentrated, could remove vegetation, compact soil and cause water channeling and pooling. Areas will be monitored for these effects and if impacts are noticed, designated areas will be temporarily closed for restoration.

Effects on Wildlife: Game Species:
Ruffed Grouse. Historical population trends are not well documented, but the consensus is that most regional trends have been downward, and that the current levels may be a temporary plateau. Results from the West Virginia Division of Natural Resources (WVDNR) bow hunter survey show that the average number of grouse seen per 100 hours was 5.52 in Tucker County over the ten year period from 1995 - 2005. This exceeded the statewide average of 3.82 grouse flushed per 100 hours. The ten year trend of grouse flushes in Tucker County indicates a slight downward trend. The decrease in amount of early successional habitat favored by grouse is the major factor affecting grouse populations. Population increases are most likely tied to early successional habitat management (Norman et al 2004).

A six year study was begun in 1996 in five States (West Virginia, Virginia, Maryland, Kentucky and Ohio). The Appalachian Cooperative Grouse Research Project was completed with a final report issued in 2004. The results concluded that hunting mortality was compensatory. Based on these results and since the grouse population has traditionally supported hunting in the valley, little impact on the grouse population from hunting on the refuge is expected.

Rabbits and Hare. Population status of the three species of lagomorphs occurring in the valley is varied. The eastern cottontail population is secure, but the Appalachian cottontail population is less well known, and the snowshoe hare is at the southern end of its range. Michael's (1974) study of hunter use in the valley showed very few rabbit or hare hunters, but his study did not extend into January and February, the prime rabbit-hunting period in West Virginia. Based on hunter information from 2002 to 2005, only 16 rabbits and one hare were harvested on the refuge. The apparent low harvest from refuge land indicates that despite low populations of Appalachian cottontail and snowshoe hare, it is highly unlikely that the harvest of these species will have any direct significant impact to local or regional populations.

Squirrels. Gray and fox squirrels prefer oak and hickory forests, neither of which exists in Canaan Valley. Squirrel populations and reproductive success have been found to be very dependent upon the annual mast crop (Nixon, et al., 1975; Weigl, et al., 1989). The occurrence of these squirrels on the refuge is uncommon; therefore, any take of squirrels is expected to be incidental to hunting other upland game species, and as such, will have little impact on the population of gray or fox squirrels.

Raccoon, Foxes (Red and Gray), and Bobcat. The refuge follows the State's regulations for raccoon, red and gray fox, and bobcat. Though no county-specific data are available, except for bobcat, healthy populations of these four species exist in the State (Brown, unpublished data, Foster pers.com. 2007). In West Virginia, raccoon populations from 1992-2005 were considered stable to slightly increasing (Rogers 2004). Hunter survey information from the refuge indicate that from 2002 to 2005 a total of only 10 people hunted raccoon on the refuge with an annual average harvest of approximately 16 animals. Following State regulations and based on county and statewide data indicating at least stable populations, the Service concludes that it is highly unlikely that the harvest of these species will have any direct significant impact to local or regional populations.

The populations of these four species are stable and healthy, and the harvest on the refuge has been and is expected to remain small. Most fox and bobcat hunters are hunting other species as well, so there will be little additional disturbance to vegetation or non-target wildlife. Canaan Valley is not a prime raccoon hunting area, so raccoon hunting is expected to be minimal. Because raccoon hunters use dogs and hunt at night, raccoon hunting will be closely monitored by being managed under a special use permit (SUP). Stipulations of the SUP include restricting dog numbers to minimize potential impacts to other wildlife.

Coyote. Coyote hunting in West Virginia has increased and a variety of methods are used because of their increasing numbers and their reputation as livestock predators (Bonwell, 1996). Coyote harvest in the Valley is expected to be small, and their take likely incidental to deer hunting. Since coyote hunting will generally be opportunistic, little to no additional disturbance to vegetation or non-target wildlife is anticipated. Under current State regulations the Service concludes that it is highly unlikely that the harvest of these species will have any direct significant impact to local or regional populations.

Opossum, Skunk, and Woodchuck. Hunting for opossum, skunk, and woodchuck in West Virginia is most often incidental to hunting other species. Some wildlife species compensate for decreased number (harvest) by increasing reproductive output. Davis, et al. (1964), found that removal of large numbers of woodchucks from a population resulted in a decrease of other mortality factors on the population, increased birth rate, and increases in immigration. Thus, the population size remained stable even though three times as many woodchucks were removed from the treatment as from the control area. The populations of striped skunk, opossum and woodchuck are stable and healthy, and the harvest on the refuge is expected to be very small, and primarily incidental. Therefore little disturbance to vegetation or non-target wildlife is anticipated. Hunting of spotted skunks, a rare species in the State, and all weasels will be prohibited.

White-tailed Deer. Deer are one of the few species on the refuge that breed during hunt season. Deer are in rut in October and November. Hunting activities occur when deer are courting and mating. However, population estimates received by the State indicate that the deer population is not at risk and, if anything, there is an abundance of deer in Canaan Valley.

The refuge will follow the State's regulations and have a hunt in various forms for about two and one-half months from mid-October through the end of December. Deer in Canaan Valley are abundant and are harming other components of the ecosystem. The Service has concluded that a deer management program maximizing the take of antlerless deer will benefit both white-tailed deer through reduction of overpopulation and the habitat through reduction of over-browsing, thus benefitting both vegetation and other wildlife species.

Overabundance of deer can produce long-term negative effects such as potential disease epizootics (Demarais et al. 2000), increase in automobile accident rates, browsing pressure on landscapes, vegetation, and crops, and severe habitat degradation (Cypher and Cypher 1988). Overbrowsing by high deer populations is a major concern of the refuge. Overbrowsing affects the abundance and distribution of vegetative species and has continued effects on the composition of forest canopy for a long time after the deer herd is reduced. This is not a concern for grasslands, as cover will quickly regenerate (Porter 1991), though species composition may be permanently altered. The effects on vegetation composition and forest regeneration are of great concern as we seek to maintain and restore spruce and balsam fir ecosystems and understory forest communities for refuge focal species and rare or sensitive plant communities. Pastures and old fields are vulnerable to overgrazing when deer densities are high because they contain more and higher quality forage, especially in spring and summer (Johnson et al.1995). Cumulative effects of grazing over successive years may result in reduced plant reproduction and growth (Augustine and Frelich 1998) and height (Anderson 1994), which exposes sensitive plants and places them at risk of extirpation (Augustine and Frelich 1998). The refuge is concerned about the impacts this phenomenon may have on migratory birds and on the existing rare plant communities found on the refuge.

Safety is a major consideration related to deer hunting on the refuge. The southern end of the refuge has numerous homes, businesses, and housing developments either within or immediately adjacent to the refuge acquisition boundary. Many area residents have expressed concern over deer hunting with rifles on the refuge. To address these concerns, "no rifle zones" will be delineated, within which only archery, shotgun, and muzzle loader hunting will be allowed, and safety zones will be delineated within which hunting will not be permitted.

The CCP promotes increased deer harvest through a refuge-run shuttle system to help with deer removal. Impacts of this shuttle system are associated with the ATV activity and include increased soil erosion along the Middle Valley trail especially during wet conditions which are typical during the deer gun season. The route is a partially vegetated and annually maintained public use trail. The use of ATV's during the week of deer gun season will likely increase the amount of trail maintenance required to ensure that soil erosion is minimized.

Additionally, the route will have to cross a section of Glade Run along the Middle Valley Trail. Crossing this section of stream with ATV's can cause stream bank erosion, siltation, and oil and gas pollution within Glade Run. There is also the potential of causing the stream bed itself to erode, thereby lowering the gradient of the stream across this section and increasing velocity of flow. This can cause erosion up and downstream from the crossing site. The refuge will minimize the effect of ATV use by hardening the banks and stream bottom of Glade Run with native stone to permit limited access for deer removal. Middle Valley Trail will also have sections hardened and/or re-graded to reduce the effects of ATV use during the removal operations. Initial work on placing rock for stream bank and bed hardening will be time and labor intensive, however it should require only minimal annual maintenance once complete. Hardening of stream banks and crossings will be complete prior to conducting the shuttle operation. Refuge staff will monitor stream crossings and sensitive areas along the Middle Valley Trail to ensure that preventive maintenance operations are completed prior to each fall's deer gun season.

It is anticipated that the short duration of ATV use along the Middle Valley Trail and through the Glade Run crossing along with limited number of trips per day will not cause significant impacts to soil erosion, siltation, or pollution of refuge resources. The expected increase in deer harvested will improve conditions within the interior of the refuge through reduced browse damage. This positive impact will likely offset potential negative effects of the use of ATV's for deer removal. In order for this use to be compatible there are several stipulations listed below which must be met. However, if deer harvest numbers do not increase significantly or if there are significant impacts to refuge resources through the use of ATV's (to remove deer along Middle Valley Trail), this use may be terminated.

It is anticipated that allowing rifle use on Reichle and Orders tracts and allowing rifle use from tree stands on Herz, Cooper, and Cortland tracts will increase deer harvest and therefore have a positive impact on the refuge's plant communities. The refuge consulted with the WVDNR and other law enforcement officials on the safety considerations of these actions. According to the WVDNR, State safety codes adequately protect hunters and other refuge visitors during hunt seasons. Rifle hunting was permitted on these tracts prior to refuge acquisition and hunting was managed only under State guidelines with no known reported incidents. The smaller tracts being opened for rifle use are being permitted only from elevated stands which will further reduce the risk of hunting activities to the general public and other hunters. The areas in which these zones are located are in the southern end of the valley and this may help reduce high deer densities in that part of the refuge. This will also increase the available areas on the refuge that are open for hunting, will provide more hunting opportunities, could increase hunter satisfaction, and could encourage hunters who might not otherwise participate. Working with our State partners and other surrounding landowners to help reduce the deer herd could provide additional opportunities for hunting, and may be effective in reducing deer populations.

The refuge will close the Freeland Tract to general public hunting to prevent conflicts with other user groups during the hunt season. The Freeland Tract is the refuge's most visited area and is also the only site which provides accessible trails. At only 86 acres, the closure of this tract will not affect the quality of the refuge hunting program and accounts for less than 1 percent of the total land area open for hunting on the refuge. However, due to the refuge's concern with deer impacts to plant communities, particularly the rare conifer wetland community on the Freeland Tract, we will permit special hunts. These hunts may include youth hunts and a special hunt for the physically disabled. We may also permit limited open hunts during the regular season should browse damage indicate that closure of this tract has exacerbated deer damage. Decisions on types of hunts permitted on the Freeland Tract will be made annually.

Black Bear. Black bear hunting on the refuge follows the State's regulations with the exceptions that on designated "no rifle zones," only archery will be allowed, and the gun season will be approximately one week shorter than the State season. The start of the gun season will be delayed until the close of antlerless deer season, so as not to impede the take of deer in order to reduce the deer herd. This will also give more opportunity for pregnant female bears to den before the start of the refuge hunting season.

Annual bear harvest in the State has been increasing dramatically since the mid 1980s. However, Tucker County only comprised an average of 11 percent of the total number of bear taken from 1966 to 2000. Out of that, an average of only 1.25 bear per year were reported taken in Canaan Valley, Cabin Mountain and Canaan Mountain combined from 1974 to 2000 (Michael 2002). It is likely that the large wetland habitat within the Valley and lack of road access make hunting bears less popular on the refuge than in surrounding areas of Tucker County. Refuge hunter harvest information indicates that only 1 bear has been reported taken from the refuge from 2002 to 2005.

Bear hunting with hounds will be permitted on the less accessible portions of the refuge. A study in Virginia focused on the effects of hunting with hounds on the bear population. The researchers compared litter size, cub survival rates, and den weights in two populations: one that is hunted with dogs and one that is not hunted. Results indicate that there are no significant differences in cub production or body condition between hunted and non-hunted populations of bear in Virginia (Higgins 1997).

The impact on the refuge population of black bear will not be significant due to the low number of bear taken each year. Similarly, the cumulative impact of bear hunting on the refuge will not be significant when combined with bear hunting impacts throughout the county or State. Less than 1.5 percent of all bear harvests in the State were taken from Canaan Valley habitats and an average of 8.2 percent of bear harvests from the County were from Canaan Valley from 1974 to 2000 (Michael 2002). These low harvest rates indicate that by continuing

bear harvest on the refuge (approximately 50 percent of the Valley's area) it is highly unlikely that the harvest of these species will have any significant impact to local or regional populations.

Wild Turkey. Wild turkey hunting follows the State's regulations. West Virginia has two turkey seasons: a spring season when only gobblers (males) are harvested, and a fall season when either sex may be legal game. Since turkeys are polygamous, spring gobbler seasons have little impact on breeding success and size of turkey populations. Fall hunting is allowed when a population is sufficiently large to withstand increased mortality. Through extensive research and management efforts, the State has restored the turkey population throughout its historical range. The State also closely monitors fall hunting impacts on population levels. Therefore, hunting on the refuge will not impact the turkey population. Both spring gobbler and fall either-sex seasons will be allowed on the refuge.

Migratory Birds, Including Waterfowl (Ducks and Geese). Fall is the season for bird migration, and hunting may disturb their resting and foraging during this critical time. The impacts from hunting are not known, but related to the frequency, type, and duration of the disturbance. For example, a woodcock hunter with a dog is more likely to flush woodcock (and other migratory bird species), than a woodcock hunter without a dog. If one area is hunted more than another, woodcock using cover in that area will be disrupted more frequently. Also, if an area is hunted in the morning and again in the evening, the duration and effect of disturbance is increased. Migrating and wintering raptors such as ruffed legged hawks may be hunting and roosting in upland and wetland habitats. Hunting activity may cause these birds to unnecessarily take flight, expending energy resources when food resources are limited. Nesting of some species of owls and raptors begins in late winter. The effects on the breeding success of these nesting birds caused by hunters passing in the vicinity of the nest is unknown. Because this use is not concentrated in space or time (it occurs all over the refuge throughout the hunting season), the disturbance effects on wildlife that are using the refuge during fall and winter are not expected to be significant.

Migratory birds, especially landbirds, are in the peak of migration during the spring turkey open season. Hunters using upland habitats may temporarily disrupt the migrating birds' feeding and resting. Between 2002 and 2005, an average of 20 hunters reported hunting during the spring turkey season. Because turkey is an upland species, hunters are less likely to enter wetland habitats. Their disturbance to other wildlife species and vegetation is concentrated on upland habitats. Due to the low number of spring hunters using the refuge and the dispersed nature of the activity, disturbance to wildlife during the spring hunting season is not expected to be significant.

Waterfowl seasons on the refuge follow State regulations, including the early September resident goose season. The refuge has small numbers of breeding waterfowl including American black duck, mallard, wood duck, and Canada goose. Studies conducted from 1980 through 1993 found Canada geese, mallards, wood ducks, and black ducks to be the most abundant waterfowl in Canaan Valley (Michael 2002). Of the species present on the refuge, black ducks are the only species of management concern listed by the Service. Black ducks are one of three species of waterfowl identified with population management objectives that are also showing long term population declines between 1970 and 2003 (North American Waterfowl Management Plan 2004). Black ducks are also listed by the WVDNR as a species of special concern (S2B: very rare or imperiled) due to the restricted habitat available for this species in the State.

Waterfowl are managed by "flyways," which follow the major migratory routes. Their population trends are monitored by the Service through the collection of data including band recoveries, hunter questionnaires, wing returns, breeding population and habitat surveys and mid-winter waterfowl surveys (Caithhamer and Dobovsky, 1995). The migratory waterfowl in Canaan Valley are a very small part of a large population of birds that are managed by the Service on a flyway basis under the Migratory Bird Treaty Act, 16 USC 703-712. The Service designs the bag limits and season lengths to maintain healthy populations of these species. Therefore, the effect of waterfowl hunting in Canaan Valley will be negligible on refuge, State, regional, local, or flyway populations.

Rails, Gallinule, and Coot. Hunting for rails, gallinules and coots on Canaan Valley refuge follows State regulations. These species are also migratory game birds managed by the Service on a flyway basis, with State regulations established within the framework of the Service's directives. Rails are occasionally heard on the refuge. Breeding records exist only for Virginia rail which has been documented in the upper Glade Run marshes and in isolated cattail stands throughout the refuge. During migration, sora rails are seen in some

wetland areas around beaver ponds. King rails may also migrate through the valley; however, no recent records exist for this species on the refuge. The harvest of these species is likely coincidental with waterfowl hunting and the numbers harvested (if any) on the refuge will not be significant to the overall flyway populations of these species.

Mourning Doves. Hunting for mourning doves follows State regulations. Like other migratory game birds, mourning doves are managed by the Service on a flyway-wide basis. The occurrence of mourning doves on the refuge is dependent upon weather conditions, habitat availability, and factors affecting their migratory behavior. They are uncommon in the State and in Canaan Valley and the lack of a "huntable population" makes the quality of such a hunt questionable. Hunting doves in Canaan Valley will have no impact on the population as a whole.

American Woodcock. The Service proposes to hunt woodcock on the Canaan Valley refuge in accordance State regulations. The American woodcock is a trust species managed by the Service and has been categorized as a "species in decline." The loss and degradation of early successional habitat is considered to be the most important factor for these population declines (USFWS 1990). The American Woodcock Management Plan, developed by the Service, focuses on habitat management, but acknowledges that managed recreational harvest of woodcock is desirable and consistent with conservation, and that recreational hunting will continue to be managed under existing regulatory processes in the United States. According to refuge hunter information, the number of woodcock taken on the refuge between 2002 and 2005 averaged 318 birds, with a high of 426 reported taken in the 2004 season. The average refuge harvest for 2002-2005 seasons represents approximately 55 percent of the State total woodcock harvested in those years.

McAuley et al (2005) note that, hunting mortality was not a significant impact relative to other sources and that habitat loss was still considered to be critical in the decline of woodcock populations. Pennsylvania implemented very restrictive season lengths in 1984 (21 days) and further restricted the seasons in 1992 (14 days) in an attempt to protect the "Pennsylvania breeding population" of woodcock. The study indicated that the restrictive season lengths had little to no effect on woodcock in Pennsylvania or that other factors contribute to the State population decline. This finding supports the theory that habitat deterioration is the major problem affecting woodcock in the eastern United States. Therefore hunting woodcock on the refuge is not expected to have an impact on the local, regional, or the flyway population.

Wilson's snipe. The refuge follows State regulations to hunt snipe. Declining populations in the eastern United States may lead to more restrictive bags and seasons in the future. Currently snipe population surveys show a stable trend from 1966 to 2005 (Sauer et al, 2005). These decisions on season length and bag limits are made on a flyway basis, and the State's regulations will reflect any adjustments made by the Service on a national scope.

Weather and habitat conditions, rather than hunting, are likely the predominant factors influencing snipe occurrence and population size at Canaan Valley. According to refuge hunt information, an average of one snipe per year has been harvested during the years 2002 to 2005. Snipe harvested in West Virginia are likely incidental take by sportsmen engaged in hunting other species; therefore, hunting is expected to have little impact on the local, State, or flyway snipe population.

Endangered, Threatened, and other Non-game species. Anticipated direct, indirect, and cumulative impacts to endangered species, threatened species, and non-game species of the refuge are described below. The refuge requested Section 7 informal consultation with the Service's West Virginia Field Office under the Endangered Species Act (16 U.S.C. 1536) on all the actions in this CCP, including hunting, that could potentially impact listed species. This process resulted in a finding that our proposed actions are not likely to adversely affect the listed species or their associated habitats on the refuge. The full Intra-Service Section 7 Biological Evaluation form can be found in appendix H of this CCP. Other, non-game species that require a more open understory, such as has resulted from deer over browsing, could be adversely affected if a reduction in the deer herd produces changes in the understory vegetation. However, as the vegetation returns to its more natural state, the associated fauna should also reflect the more natural diversity. The overall species diversity of the refuge is not expected to be diminished by this hunting alternative.

Disturbance to non-hunted migratory birds could have regional, local, and flyway effects. Regional and flyway effects will not be applicable to species that do not migrate such as most woodpeckers, and some songbirds such

as cardinals, titmice, wrens, chickadees, etc. Disturbance by hunting to non-hunted migratory birds should not have cumulative negative impacts for the following reasons. Hunting seasons do not coincide with the nesting season. Long-term future impacts that could occur if reproduction was reduced by hunting are not relevant for this reason. Disturbance to the daily wintering activities, such as feeding and resting, of birds may occur. Disturbance to birds by hunters is probably commensurate with that caused by non-consumptive users.

Disturbance by hunting to non-hunted wildlife will be the most likely negative cumulative impact. However, disturbance is unlikely for the following reasons. Small mammals, including bats, are generally inactive during winter when hunting season occurs. Both of these qualities make hunter interactions with small mammals extremely rare. Hibernation or torpor by cold-blood reptiles and amphibians also limits their activity during the hunting season when temperatures are low. Hunters will rarely encounter reptiles and amphibians during most of the hunting season. Encounters with reptiles and amphibians in the early fall are few and should not have cumulative negative effects on reptile and amphibian populations. Invertebrates are also not active during cold weather and will have few interactions with hunters during the hunting season.

User Conflict

Increasing the number of rifle hunting areas may result in additional user conflicts between hunters and non-hunters. Some perspectives include opposition to increasing access for hunters on the basis of unfairness of unequal access. Other enhancements that favor hunters may cause adverse impacts. For example, assisting hunters with game retrieval will provide special access for a specific group (hunters) and may cause damage to refuge resources. In more general terms, providing shuttles, improving roads, and investing in other improvements for hunting access will use budget dollars that could support other refuge activities and users. It is anticipated that these issues could be resolved with outreach and education by, for example, explaining that managing the white-tailed deer population helps to prevent over-browsing of refuge habitats. Furthermore, user conflicts are minimized because, according to State regulations, it is illegal to shoot a firearm within 400 feet of a school or church, or within 500 feet of a dwelling, or on or near a park or other place where people are gathered for pleasure. Also, hunting occurs during the winter, when fewer people visit the refuge.

The overall impacts of this use were fully reviewed and discussed in the "Amended Environmental Assessment, Hunt Program Proposal, Canaan Valley National Wildlife Refuge" (USFWS 2007b). Please refer to this document for a full discussion of direct, indirect and cumulative impacts for this use.

Hunter disturbance to non-hunted resident wildlife may be a negative cumulative impact; however, such an impact is unlikely because of the timing of the hunt. The hunts will occur during a time of the year when small mammals, reptiles, amphibians, and invertebrates are inactive and thus the likelihood of hunter interaction is rare. Isolated encounters with small mammals, reptiles, amphibians, and invertebrates should not have cumulative negative effects on populations.

PUBLIC REVIEW AND COMMENT

This compatibility determination was released concurrent with the draft CCP/EA for a 45-day public review and comment period.

DETERMINATION (CHECK ONE BELOW):

_____ Use is not compatible

__**X**__ Use is compatible with the following stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

1. The use of private ATVs or other off-road vehicles on refuge lands is prohibited.

2. The use of nails, wire, screws, or bolts, to attach a stand to a tree is prohibited, as is the use of a tree with existing nails, wire, screws, or bolts.

3. Hunting over bait is prohibited.

4. The use or possession of alcoholic beverages while hunting is prohibited.

Hunting on the refuge will also be contingent on the following refuge-specific stipulations:

1. While participating in hunts on the refuge, hunters must have in their possession a current, signed Canaan Valley National Wildlife Refuge Hunting Permit and the appropriate State hunting license(s) and Federal waterfowl stamps.

2. Only the following game species may be taken on the refuge: white-tailed deer, black bear, wild turkey, waterfowl, mourning dove, rails, gallinule, coot, American woodcock, snipe, squirrel, ruffed grouse, rabbit, hare, red and gray foxes, raccoon, bobcat, woodchuck, coyote, opossum and striped skunk.

3. State regulations stipulate that it is illegal to shoot a firearm within 400 feet of a school or church, or within 500 feet of a dwelling, or on or near a park or other place where people are gathered for pleasure.

4. The refuge will be closed to hunting between March 1st and August 31st of each year, except for the spring turkey season.

5. All game that is killed or crippled shall be retrieved, if possible, and retained in the custody of the hunter in the field.

6. In the no-rifle zone of the refuge, the following stipulations are in place:

   - The take of big game will be restricted to archery, muzzleloader, and shotgun. The take of upland/small game will be restricted to shotgun only.

   - Handguns will not be used to take game.

   - Muzzleloaders will be restricted to the type defined by State regulations; telescopic sights will be permitted during buck, antlerless, and muzzleloader seasons.

   - Shotguns firing slugs will be permitted for deer hunting.

7. Hunting birds with pointing and/or retrieving dogs will be permitted, but no more than two dogs per hunter will be allowed in the field. Extra dogs remaining in a hunter's vehicle will not count as dogs in the field.

8. The take of wild turkeys with rifles will be prohibited throughout the refuge, and shot larger than #4 will be prohibited.

9. A minimum of 400 square inches of blaze orange must be worn by all hunters, except for waterfowl, turkey, and archery hunters. For waterfowl, turkey, and archery hunters, 400 square inches of blaze orange must be worn while traveling between stands and/or blinds.

10. Portable tree stands are the only type permitted on the refuge.

11. Trimming or cutting branches is prohibited. Hunting from blinds made from cut conifer tree branches (balsam fir, red spruce, hemlock) is prohibited.

12. All tree stands must have the name and address of the owner clearly printed on the stand. All stands must be removed by the last day of deer season.

13. The refuge bear gun season will be the same as the State seasons.

14. Bear gun hunters will be limited to six dogs each. Releasing and picking up dogs on Cortland Road and Old Timberline Road will be prohibited.

15. All dogs are required to wear a collar displaying the owner's name, address, and telephone number.

16. Hunters who lose dogs will be required to search for them for three days, and will not be allowed to hunt during the search period.

17. Dog training is prohibited except during legal hunting seasons.

18. Hunting rabbits and raccoons with dogs will be permitted, but no more than four dogs per hunter will be allowed in the field. Extra dogs remaining in a hunter's vehicle will not count as dogs in the field.

19. Raccoon dog training and/or "night hunts" will be prohibited except during raccoon hunting season.

20. Night hunting on the refuge will be by special use permit only. Hunters will have to apply for the permit in person or by mail or telephone.

21. Hunting will be prohibited on refuge lands west of Highway 32 and adjacent to Canaan Valley Resort State Park.

22. No camping is allowed on refuge lands.

23. All accidents and injuries must be reported to the refuge office as soon as possible.

24. Trail maintenance will be emphasized to harden wet areas along Middle Valley Trail and immediately repair areas damaged by the use of ATV's during the first week of deer gun season.

25. Stream banks and stream bottom of Glade Run will be hardened using native stone to reduce the potential impact of erosion by ATV use to remove deer during the first week of deer gun season.

26. Persons possessing, transporting, or carrying firearms on national wildlife refuges must comply with all provisions of State and local law. Persons may only use (discharge) firearms in accordance with refuge regulations (50 CFR 27.42 and specific refuge regulations in 50 CFR Part 32).

JUSTIFICATION

Hunting, when compatible, is defined as one of the priority public uses of the Refuge System by the National Wildlife Refuge System Improvement Act of 1997. Permitted regulated hunting on the Canaan Valley refuge will not have any significant impacts on the refuge environment, populations of hunted species, adjacent lands, or nearby residents. The refuge environment includes soils, vegetation, air quality, water quality, and solitude. Some disturbance to the soils and vegetation is expected in areas open to hunting, but impacts will be minimal due to the dispersed nature of the activity and the fact that soils are typically frozen and vegetation is mostly dormant during State hunting seasons. Hunting will benefit vegetation by keeping resident herbivore wildlife populations in balance with the carrying capacity of the habitat. Impacts on physical resources resulting from trampling of vegetation will be minimal and temporary as vegetation will recover. Wildlife and vegetation surveys, data, and personal communications with other scientists, State biologists, and universities, have led the staff of Canaan Valley refuge to conclude that the high density of deer causes much more damage to vegetation than allowing hunting. For these reasons, permitting this use will not impair the refuge's ability to conserve

wetland vegetation, plant resources and habitats as directed by the Emergency Wetland Resources Act (1986) and the mission of the refuge system.

Disturbance to other wildlife will occur, however the impact will be lessened because of the time of year hunting is permitted. Off-trail access is necessary to permit this priority public use. Because the use is necessarily spatially dispersed and it occurs over the duration of the various State hunting seasons, the disturbance impacts will be less intense. Restricting night time raccoon hunting through the issuance of a special use permit provides the refuge with greater control to prevent disturbance during evening hours. These disturbance impacts will not materially affect the refuge's ability to fulfill its overall obligations to protect, conserve and manage fish, wildlife or plant species as directed by the mission of the Refuge System.

Hunting will not have any effect on threatened or endangered species utilizing the refuge. The Cheat Mountain salamander is restricted to one tract on the refuge in higher elevations. This species is active when surface temperatures are above 55F which typically does not occur during the State hunt seasons. Additionally, the majority of hunting activity occurs outside of the spruce forest habitat occupied by this salamander. The endangered Indiana bat is known to occur only during summer and early fall on the refuge, which is mostly outside the refuge hunt seasons. The most sensitive locations for this species are hibernacula and maternity colonies. To date these have not been documented on refuge lands.

Allowing hunting will provide recreational opportunities at Canaan Valley refuge to hunters from all over the country. Data collected between 2002 and 2005 indicate that an average of 891 people hunt on the refuge every year. These hunters come from approximately 18 different states. This activity and program produces a positive impact on refuge management, visitor attitudes, and the local economy. The local purchases of gas, food, lodging, hunting licenses, equipment, and supplies, from mostly out-of-State hunters contributes significantly to the local economy. In 2004, total hunting visitor expenditures in a tri-county area (Tucker, Marion, Monongalia) was $54,800 (USFWS 2005). Hunters spread the word to their friends, encouraging them to come to the area to take advantage of the high quality recreation and, thus, positively affect the economy of the area. Deer hunting will also contribute to the reduction of vehicle damage and human injury from collision between deer and vehicles. In 2004, 14,739 deer were reported killed by collision with vehicles in West Virginia (WVDNR 2009).

Increased hunting opportunities will increase the number of licenses and duck stamps sold, as well as the amount of locally purchased hunting supplies. An increase in hunting opportunities on the refuge will not affect the refuge's non-consumptive users; therefore, there will be no negative impacts on the contributions already made to the local economy by non-consumptive users.

Based on wildlife surveys and population estimates conducted by the State as well as the Service (in regards to migratory birds), wildlife which are harvested on the refuge have surplus populations and are able to sustain regulated harvest without impacting local or regional populations. Both the State and Service review harvest information annually to assess impacts on population levels and adjust, if necessary, take limits and season lengths. These regulations ensure the continued well-being of overall populations of game animals. Hunting does result in the taking of many individuals within the overall population, but restrictions are designed to safeguard an adequate breeding population from year to year. Hunting under State and Federal guidelines, as well as refuge-specific regulations, will not impact the populations of resident wildlife or migratory birds that the refuge protects and will not have adverse effects on the overall conservation of wildlife or their habitats on the refuge. Based upon State and Federal regulations, the hunting program will operate under sound wildlife management principles and is in the public interest as directed under 50 CFR 32.1.

Specific refuge regulations address equity and quality of opportunity for hunters, and help safeguard refuge habitat. Disturbance to other wildlife does occur, but this disturbance is generally short-term and adequate habitat occurs in adjacent areas. Apart from the refuge's deliberate efforts to reduce the deer population to a balanced level, hunting of other species as described will not significantly affect the local or regional population of any of these species. For these reasons, public hunting will not prevent the refuge from fulfilling the purposes of the Fish and Wildlife Act (1956) or the mission of the Refuge System for conserving, managing, restoring,

and protecting wildlife resources. In addition, deer hunting will help control the refuge's deer population and reduce over browsing. This directly supports the refuge purpose (Emergency Wetland Resources Act 1986) by conserving refuge wetland communities, and it supports the founding purpose to ensure the ecological integrity of Canaan Valley as stated in the 1979 EIS. The areas open to migratory game bird hunting will not exceed 40 percent of those tracts acquired under the Migratory Bird Conservation Act (16 U.S.C. 668dd(d)(1)(A)). Because the hunt program will be operated under Federal regulations for migratory birds, and in concert with State regulations, the hunt program will not affect the refuges' responsibility to ensure the protection and management of migratory birds as directed for the tracts purchased under the authority of the Migratory Bird Conservation Act (1929).

In summary, the hunt program on the refuge will not have any significant impacts to hunted species, to the local or regional populations of these species, to the refuge environment, to adjacent lands, or to nearby residents. By permitting public hunting the refuge is fulfilling the mission of the Refuge System by administering refuge resources for the benefit of present and future generations. For these reasons, we have determined that hunting will not materially interfere with or detract from fulfilling refuge purposes and mission of the Refuge System.

SIGNATURE:

Refuge Manager: Kenneth K. Acting _____ 2/14/2011
(Signature) (Date)

CONCURRENCE:

Regional Chief: Timothy D Sieg _____ 02/25/2011
(Signature) (Date)

MANDATORY 15 YEAR RE-EVALUATION DATE: 02/25/2026

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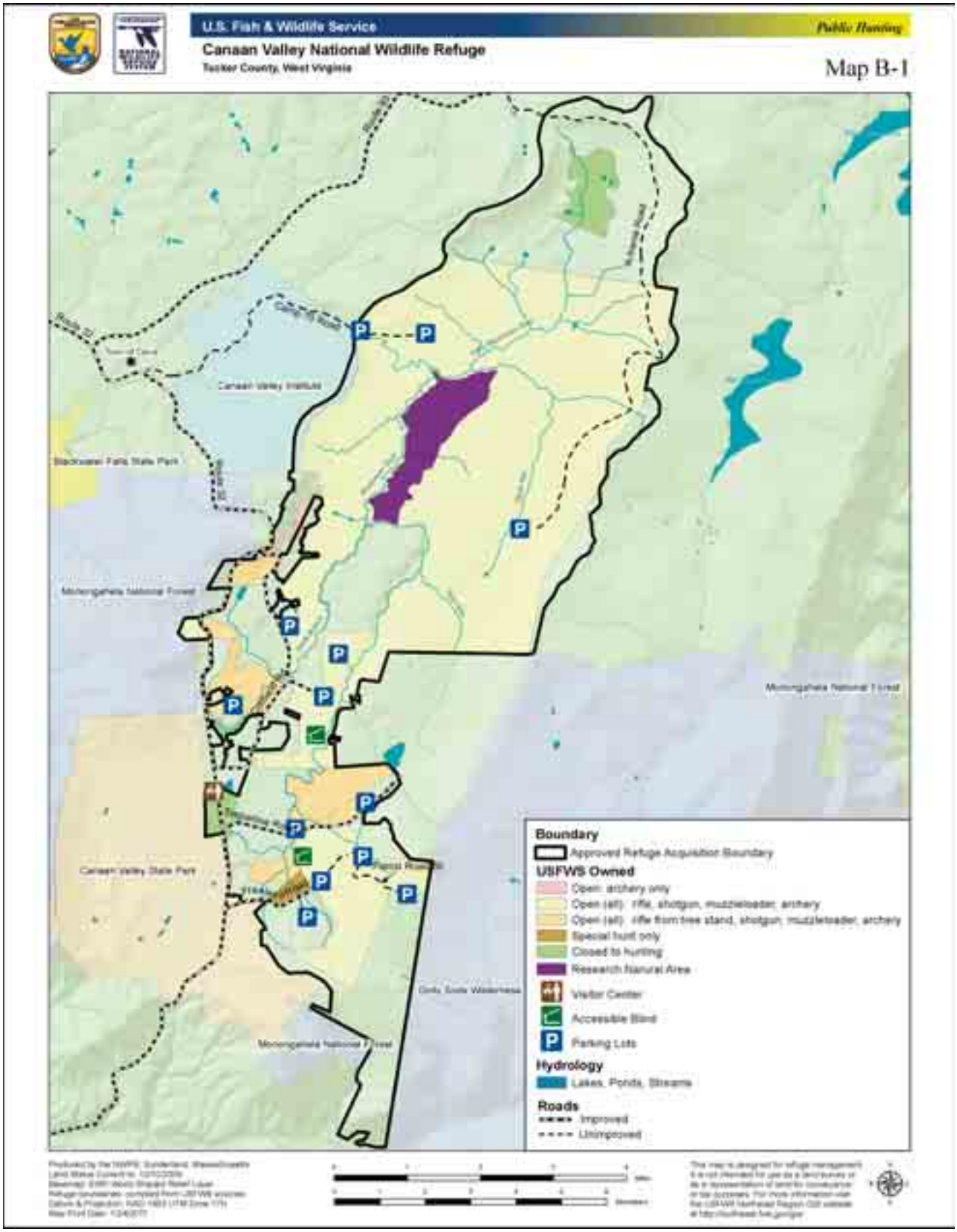
Attachment: Map B-1 Public Hunting


U.S. Fish & Wildlife Service
Public Hunting
Canaan Valley National Wildlife Refuge
Tucker County, West Virginia
Map B-1
Boundary
Approved Refuge Acquisition Boundary
USFWS Owned
Open: archery only
Open (all): rifle, shotgun, muzzleloader, archery
Open (all): rifle from tree stand, shotgun, muzzleloader, archery
Special hunt only
Closed to hunting
Research Natural Area
Visitor Center
Accessible Blind
Parking Lots
Hydrology
Lakes, Ponds, Streams
Roads
Improved
Unimproved
Blackwater Falls State Park
Canaan Valley State Park
Monongahela National Forest

COMPATIBILITY DETERMINATION

USE

Public Fishing

REFUGE NAME

Canaan Valley National Wildlife Refuge

DATE ESTABLISHED

August 11, 1994

ESTABLISHING AND ACQUISITION AUTHORITY(IES)

The establishment of Canaan Valley National Wildlife Refuge (refuge) was first approved in an Environmental Impact Statement (EIS) released on May 30, 1979. However, the U.S. Fish and Wildlife Service (Service) decided to await the outcome of litigation surrounding a proposed storage hydroelectric facility before pursuing any further action. The approval of the refuge was affirmed by the Service in a 1994 Final Environmental Assessment and Finding of No Significant Impact on July 11, 1994, which confirmed the adequacy of the previously approved 1979 EIS. The refuge was officially established when the first tract of land was acquired on August 11, 1994. The Service has acquired lands for the Canaan Valley refuge under the following authorities:

1. Fish and Wildlife Act of 1956 [16 U.S.C. 742f(a)(4)]
2. Emergency Wetlands Resources Act of 1986 [16 U.S.C. 3901b]
3. Migratory Bird Conservation Act of 1929 [16 U.S.C. 715d]

REFUGE PURPOSE(S)

The refuge was established to ensure the ecological integrity of Canaan Valley and the continued availability of its wetland, botanical, and wildlife resources to the citizens of West Virginia and the United States (USFWS 1979, 1994). Additional refuge purposes derived from the legislative authorities are as follows:

(1) "... for the development, advancement, management, conservation, and protection of fish and wildlife resources..." (Fish and Wildlife Act of 1956; 16 U.S.C. 742f (a)(4));

(2) "... for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions." (Emergency Wetlands Resources Act of 1986; 16 U.S.C. 3901(b)); and,

(3) "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (Migratory Bird Conservation Act of 1929; 16 U.S.C. 715d).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans. National Wildlife Refuge System Improvement Act, 16 U.S.C § 668dd (a)(2).

DESCRIPTION OF PROPOSED USE

(a) What is the use? Is the use a priority public use?
The use is public fishing on publicly accessible beaver ponds and the Blackwater River and its tributaries on the refuge. Priority public uses of the National Wildlife Refuge System (Refuge System) are defined by statute and regulation as: hunting, fishing, wildlife observation and photography, environmental education, and interpretation (16 U.S.C. §668ee(2), 50 CFR §25.12). Fishing is one of the six priority public uses of the refuge system. Using non-motorized watercraft to facilitate fishing is mentioned briefly in this document, but effects are analyzed in the compatibility determination entitled "Wildlife Observation, Photography, Environmental Education, and Interpretation."

(b) Where would the use be conducted?
The use will be conducted in all open areas within the refuge. The West Virginia Division of Natural Resources (WVDNR) stocked largemouth bass in beaver ponds on the property in 1964. No additional stocking by the State has occurred since then on the Main Tract. About 20 large ponds currently exist but their capacity to support fish habitat is unknown. No scientific inventory has been conducted to determine what existing beaver ponds still contain sport fish. Reports from local anglers indicate that rock bass (*Ambloplites rupestris*) are caught in beaver ponds receiving water from Glade Run on the east side of the wetland and the Blackwater River on the west side. Sunfish species such as bluegill (*Lepomis macrochirus*) and pumpkinseed (*L. gibbosus*) are also reported from these ponds. Beaver ponds can be dynamic and sustaining fish habitat is dependent upon beaver activity, climate, and wetland conditions. Beavers continually create new impoundments and old ponds disappear through abandonment or successional changes that decrease standing water.

Fishing also occurs along the banks of the Blackwater River and its tributaries within the refuge. Vehicle access to Main Tract waters is primarily along A Frame road and Delta 13 road. Anglers typically walk designated pedestrian roads and trails to fishing access points. These points are: the Blackwater River which can be accessed from Delta 13 road, Timberline road, and Old Timberline road. Beaver pond complexes can be accessed from Delta 13 road and the A-Frame road. Glade Run can be accessed by the north and south crossing of the Middle Ridge trail. See map B-2 for fishing access locations.

(c) When would the use be conducted?
Beaver ponds and the Blackwater River are open year round subject to West Virginia State fishing regulations. Daily hours of use are between one hour before sunrise and one hour after sunset when the refuge is open to the public. Fishing at the south end fluctuates and is heavier during spring trout stocking of the Blackwater River. Additional information regarding timing of fishing is not known although concentrated use is expected in spring at peak water and stocking levels.

(d) How would the use be conducted?
Fishing methods and harvest limits on the refuge conform to West Virginia State law. The refuge will prohibit the possession or use and collection of live or dead bait fish (including crayfish and amphibians) on the refuge. Anglers enter the refuge from parking lots, follow designated public use trails and walk to fishing waters. Fishing areas in winter will be accessed by cross-country skiing or snowshoeing along designated roads and trails. Since no snow removal is conducted on refuge roads or parking areas, anglers may have to park farther away from refuge parking areas and public access sites during winter months. Anglers using non-motorized watercraft on the Blackwater River will enter the refuge from outside refuge boundaries or from designated refuge access points. Overland transport of watercraft is permitted on designated public use roads and trails to facilitate fishing access. Safety and information signs will be installed and maintained as necessary.

The use of gasoline motors will be prohibited on the refuge. Gasoline motors cause increased disturbance to wildlife and can pollute water through gas and oil discharge. The riparian corridor of the Blackwater River is an important resting and feeding area for refuge waterfowl. Eliminating the noise disturbance from gasoline motors will reduce the level of disturbance to waterfowl and other waterbirds utilizing river habitats.

A refuge officer will record the number of anglers fishing, areas used for fishing, access routes used, timing of use, and any related safety concerns. Anglers may be checked to determine compliance with State and refuge regulations. Use will be monitored annually to determine if it remains compatible.

(e) Why is this use being proposed?
Fishing existed on the refuge lands prior to acquisition and is considered to be a priority public use of the Refuge System. Allowing this use will continue to provide an opportunity for the public to engage in a priority public use.

AVAILABILITY OF RESOURCES

The resources necessary to provide and administer this use are available within current and anticipated refuge budgets. Staff time associated with administration of this use is spent maintaining associated road infrastructure, collecting visitor use data, analyzing use patterns, monitoring potential impacts of the use on refuge resources, and providing information to the public about the use.

The program is administered by the deputy refuge manager, resource impacts are monitored by the wildlife biologist, visitor use is monitored by a park ranger and outdoor recreation planner, and maintenance and repair will be performed by a heavy equipment operator. Additionally, resource protection is provided by a park ranger (refuge officer) and deputy refuge manager.

Refuge vehicles are needed to effectively administer the use. The heavy equipment operator performs the maintenance and repair of refuge roads, parking lots, and associated structures. The refuge has heavy equipment including a motor grader, dump truck, bulldozer, backhoe, 4x4 farm tractor, bobcat, and front-end loader.

Annual costs associated with the administration of public fishing on the refuge are estimated below:

Road maintenance and repair, sign installation and kiosk construction and repair, maintaining parking areas, and picking up and removing litter associated with bank fishing activities

- WG-10 Equipment Operator for 10 work days = $2,725.60

Planning and supervising staff to monitor the use and its effects on environment and other visitors

- GS-13 Refuge Manager for 1 work day = $313.68 (at $39.21 per hour)
- GS-11/12 Deputy Refuge Manager for 3 work days = $836.16

Resource protection, monitoring fishing activities and interactions with other users, visitor services, sign maintenance, litter removal

- GS-9 Refuge Officer for 5 work days = $1,228.80

Monitoring habitat impacts from fishing activities

- GS-12 Wildlife Biologist for 2 work days (training & interagency coordination) = $735.04
- GS-11 Wildlife Biologist for 2 work days (sampling, electro shocking etc.) = $594.56
- GS-7 Biological Science Technician for 3 work days (sampling, electro shocking etc.) = $602.64

Providing information to the public about public fishing and compiling use data

- GS-11 Park Ranger for 5 work days = $1,765.20

Motor vehicle fuel / law enforcement patrols = $100.00

Heavy equipment fuel = $250.00

Kiosk repair, signs, printing maps and information = $1,000.00

Grand Total Estimated Costs = $10,288.24

FY 2009 Budget Allocations:

Employee Salaries and benefits = $624,039.53

Fixed costs (utilities, fuel, administrative) = $211,415.23
Base maintenance = $50,000
Discretionary Funds (maps, printing, etc.) = $62,243.32
Total Available Funds for FY 2009 = $947,698.08

Based on a review of the budget allocated for recreational use management, funding is adequate to ensure compatibility and to administer and manage the recreational use listed and is expected to remain adequate, subject to the continuing availability of appropriated funds

ANTICIPATED IMPACTS OF THE USE

To evaluate potential impacts, existing information on Canaan Valley wetlands, streams, dominant plant communities and soils were overlaid onto the base map. All soils associated with trails were evaluated for their compaction and erosion potential from information received from a Natural Resource Conservation Service soil scientist and the Tucker County soil survey. Information from WVDNR species of special concern database was added to the map. Trails that fragmented habitat and crossed wetland soils were identified.

A comprehensive literature review was conducted of published scientific journal articles detailing impacts to plants, soils, and wildlife through public use activities. Additional information was gathered from biologists, land managers and scientists who had experience with wildlife disturbance and trail management issues.

A contract hydrologist and soil scientist were hired to conduct field investigations of routes proposed for public use. Recommendations were given on limiting factors of these trails and restoration required to make existing trails suitable for continued public use.

Potential impacts of fishing access include: soil compaction and erosion, downstream sedimentation, trampling and mortality of fragile wetland plant communities, habitat loss/deterioration, and wildlife disturbance. These threats are described below based on literature reviews and staff field examinations:

Effects on Vegetation: Vegetation surveys have been conducted in Canaan Valley to document dominant plant communities and as well as rare plant species and plant communities (Fortney 1975, Bartgis and Berdine 1991, Fortney 1997). Foot travel to and use of fishing locations can have indirect impacts to plants by compacting soils and diminishing soil porosity, aeration and nutrient availability that affect plant growth and survival (Kuss 1986). Hammitt and Cole (1998) note that compaction limits the ability of plants to revegetate affected areas. Regularly occurring foot travel can crush plants. Rare plants with limited site occurrence are particularly susceptible. Many plant species considered rare in the State are found associated with riparian wetlands in the Canaan Valley (Bartgis and Berdine 1991). Fishing along riparian corridors may cause trampling impacts to rare plants disproportionate to other public use activities.

Walking to fishing areas during the growing season could cause increased damage to plants in the wetland communities. Plants in the process of growth and producing flowers, and growing in wet or moist soils, are the most sensitive to disturbance from trampling effects (Kuss 1986). Moist and wet soil conditions are common in Canaan Valley, particularly during spring and early summer, and are directly associated with areas around beaver ponds and along riparian corridors where fishing occurs.

It is anticipated that allowing fishing access will cause minor vegetation loss. Foot travel may slightly increase root exposure and trampling, and some rare plant species could be impacted by anglers walking around beaver ponds or along riparian corridors. However, observations from refuge staff and anecdotal reports suggest that less than 10 persons per month fish the subject ponds in the northern portion of the refuge. Therefore, continuing pedestrian access for fishing, at the current level of use, is not anticipated to cause any significant impacts to plants or plant communities due to the low numbers of anglers interested in walking off trail to access remote beaver ponds or river sections. Additionally, the area of impact is generally spread to a variety of sites which prevents a concentrated impact at any one location.

Effects on Soils: Soils can be compacted and eroded as a result of continued foot traffic. All soils associated with wetland habitats were rated as either high or very high in their potential for compaction (Bell 2002). Impacts to soils will likely be greater during the growing season due to the greater soil moisture content at that time of year. The Mauch Chunk-derived soil in Canaan Valley is particularly vulnerable to mechanical erosion when the vegetation has been removed (Rizzo 2002). If compacted, Mauch Chunk soils can facilitate rapid water runoff that accelerates erosion down slope (Rizzo 2002). Field investigations of trails in Canaan Valley have documented extensive damage, displaying classic examples of the erosive nature of Mauch Chunk-derived soils after years of unregulated use. Although foot travel did not create highly erosive conditions in this soil type, lug soles of hiking boots could perpetuate the problem. Fishing along river corridors may cause bank erosion allowing sediment to enter the Blackwater River and its tributaries.

It is anticipated that minor impacts to soils will occur as a result of allowing fishing access on the refuge. Erosion potential will likely vary during the year based on soil moisture and temperatures. At the current use level, impacts to soils (erosion, compaction) are not likely to be significant. We do not expect large increases in the level of use due to the fact that the remote areas of the refuge will not be stocked by the State with game species and many ponds are difficult to access on foot.

Effects on Hydrology: Trails can affect the hydrology of an area, primarily through alteration of drainage patterns. Bartgis and Berdine (1991) note that roads and trails can divert water from their original drainage patterns in Canaan Valley. This can result in some drainages becoming dry while others accelerate erosion by being forced to carry more water. Zeedyk (2002) documented many instances in Canaan Valley where existing trails were channeling water away from historical wetlands and, in some cases, causing erosion and sedimentation of bog and other wetland communities. These historical problems have profoundly if not irreversibly altered the extent, depths, characteristics and function of the wetlands on the Main Tract (Zeedyk 2002). The effects of these trails and roads were a direct result of vehicle use and road construction prior to the refuge's acquisition of the property. Since then measures have been taken to remediate erosion and sedimentation issues, particularly on trails that are open to public access. Furthermore, since the refuge has now acquired lands within the acquisition boundary, it can now prohibit vehicle use and road construction in certain areas so as to minimize these types of impacts.

Angler foot traffic on existing trails will create only minor hydrologic impacts and is not anticipated to significantly exacerbate existing hydrologic problems. Maintenance will be required to create adequate and proper drainage so that existing routes do not impact local hydrology. These impacts are not likely to be significant in relation to other public uses permitted on refuge trails. Foot traffic off trail, if concentrated, could remove vegetation, compact soil and cause water channeling/pooling. Areas will be monitored for these effects and if impacts are found, areas will be temporarily closed for restoration.

Effects on Wildlife: About 20 large ponds currently exist but no inventory has been conducted to determine what existing beaver ponds still contain fish. Reports from anglers indicate that rock bass and largemouth bass are caught in beaver ponds receiving water from Glade Run on the east side of the refuge and the Blackwater River on the west side. Sunfish species such as bluegill and pumpkinseed are also reported from these ponds. Twenty of the thirty documented fish species which occur on the refuge are native. The others are non-native species introduced on purpose or through accidental releases from anglers using live bait. For example, bass

were introduced into the valley by the State in the 1960's. Rainbow and brown trout are stocked annually in the Blackwater River.

Brook trout are the only native salmonid to the Blackwater River. Naturally reproducing brook trout populations exist in several small, cold streams that flow into the Blackwater River. Although no refuge-wide survey has been accomplished, populations of brook trout are known from Idleman's Run, Freeland Run, and Yokum Run. There are historical documentations in the Little Blackwater River, North Branch, Flag Run, and two other small tributaries in the valley. Additionally, some limestone springs have been noted with brook trout on the south end of the refuge.

Redside dace, a rare, medium-sized minnow, has also been found on the refuge. This species is listed as a State species of concern (S1S2) and is known from only 9 localities in West Virginia (Stauffer et al. 1995). Historical records document this species occurring in Freeland Run, Sand Run, and the North Branch. Records of this species in the 1940's and 1950's were apparently common in Canaan Valley, occurring in small tributaries as well as the main stem of the Blackwater River (Cincotta et al. 2002). However surveys by the WVDNR in recent years have found this species only in Freeland Run and only one individual was found. It is possible that habitat alteration from development and other land use practices have degraded stream conditions, therefore contributing to the decrease in the redside dace population. Angling pressure is not considered to have played an important role in reducing the redside dace's population on the refuge. Redside dace are a minnow, not a sport fish, and as such they are not a target species for anglers.

Impacts to the fishery are expected to be insignificant. Most game species present on the refuge are non-native species to the Blackwater watershed. Native brook trout occur in very limited locations in smaller drainages in the valley. Overfishing these areas could have a significant effect on their persistence on the refuge. However, most drainages where brook trout are found are not fished aggressively due to the small size of the streams and correspondingly small size of the fish. Additionally, habitat degradation from grazing and water diversions as well as the stocking of non-native brown trout are considered to be a larger threat to brook trout populations than angling pressure.

The largest pressure on fish populations on the refuge is for stocked rainbow and brown trout populations. These are non-native species to the Blackwater River watershed and are stocked annually by the State. Permitting fishing access for these species is considered to be an acceptable form of wildlife-dependent recreation on the refuge which does not significantly impact refuge resources. Since the fishery is artificially stocked, the rainbow and brown trout populations are supplemented to compensate for angling pressures.

The presence of anglers can impact terrestrial wildlife. Disturbances vary with the species involved and the type, level, frequency, duration and the time of year such activities occur. Whittaker and Knight (1998) note that wildlife response can include attraction, habituation, and avoidance. These responses can have negative impacts to wildlife, such as mammals becoming habituated to humans, making them easier targets for hunters. Human-induced avoidance by wildlife can prevent animals from using otherwise suitable habitat (Pomerantz et al. 1988).

Foot travel to fishing areas will occur on established trails. Trail use can disturb wildlife outside the immediate trail corridor (Trails and Wildlife Task Force 1998, Miller et al. 2001). Miller et al. (1998) found bird abundance and nesting activities (including nest success) increased as distance from a recreational trail increased in both grassland and forested habitats. Bird communities in this study were apparently affected by the presence of recreational trails, where common species (i.e., American robins) were found near trails and rare species (i.e., grasshopper sparrows) were found farther from trails. Songbird nest failure was also greater near trails (Miller et al. 1998).

Humans walking off trail have been shown to cause greater disturbance (greater area of influence, flush distance, and distance moved) to wildlife than walking within trail corridors (Miller et al. 2001). Predictability of disturbance (on trail vs. off trail) has been cited as a major factor in impacts to wildlife. Walking off trail is considered less predictable to wildlife and typically more disruptive (Knight and Cole 1991, Trails and Wildlife Task Force 1998, Miller et al. 2001). Requiring anglers to use designated public use trails to access fishing areas will help limit this type of disturbance.

Disturbance can cause shifts in habitat use, abandonment of habitat, and increased energy demands on affected wildlife (Knight and Cole 1991). Flight in response to disturbance can lower nesting productivity and cause disease and death. Knight and Cole (1991) suggest recreational activities occurring simultaneously may

have a combined negative impact on wildlife. Hammitt and Cole (1998) conclude that the frequent presence of humans in wildland areas can dramatically change the normal behavior of wildlife mostly through unintentional harassment.

Seasonal sensitivities can compound the effect of disturbance on wildlife. Examples include regularly flushing birds during nesting or causing mammals to flee during winter months, thereby consuming large amounts of stored fat reserves. Hammitt and Cole (1998) note that females with young (such as white-tailed deer) are more likely to flee from a disturbance than those without young. Year-round fishing may disturb wildlife during sensitive periods of their life cycle.

It is anticipated that there will be temporary disturbances to wildlife species because of walking and fishing around ponds. Fishing at beaver ponds may have a greater disturbance to birds than walking on pedestrian routes. State listed species of concern such as alder flycatchers (*Empidonax alnorum*), American bitterns (*Botaurus lentiginosus*), Virginia rails (*Rallus limicola*), and American black ducks (*Anas rubripes*) nest and feed in and around beaver ponds. Due to the scarcity and small size of ponds in Canaan Valley, birds likely concentrate in these waters and therefore are vulnerable to disturbance by anglers. Prolonged angler presence at these areas could disrupt normal nesting behavior and possibly disturb nests in the vegetation surrounding the ponds. Waterbirds may also be prevented from resting and feeding on water bodies by angler presence (Havera et al. 1992).

Similar impacts may occur from fishing along riparian corridors. Stream and river corridors are known to be important areas for a variety of wildlife species and typically have greater species diversity then other habitats (Technical Riparian Work Group 1992, Trails and Wildlife Task Force 1998). Therefore, disturbance to riparian corridors may have a disproportionate affect on wildlife using refuge habitats.

Impacts to wildlife may be indirectly caused through erosion and subsequent sedimentation of streams and vernal pools because of foot travel over bare soils and around drainages. Amphibians lay eggs in the shallow pools that surround beaver ponds on the Main Tract during spring and summer. Species such as spotted salamanders (*Ambystoma maculatum*), red-spotted newt (*Notophthalmus viridescens viridescens*), pickerel frog (*Rana palustris*), American toad (*Bufo americanus americanus*), and wood frogs (*Rana sylvatica*) nest and feed in these locations. Anglers using beaver ponds could potentially disturb and destroy egg masses in the early spring by wading in and through these shallow pools.

Sedimentation can directly kill aquatic invertebrates, which impacts the success of amphibian larvae and adults (Sadoway 1981). Observations by refuge staff in 2002 documented numerous occurrences of amphibian egg masses that failed after becoming coated in sediment from eroding trails and roads used by vehicles nearby. Bartgis and Berdine (1991) reported that sedimentation was damaging habitat in Canaan Valley and could cause impacts to the rare plants, water quality, and possibly affect habitat of the southern water shrew (*Sorex palustris punctulatus)*, a State species of concern. The effects of sedimentation were a direct result of vehicle use and road construction prior to the refuge's acquisition of the property. Since then measures have been taken to remediate erosion and sedimentation issues, particularly on trails that are open to public access. Additionally, since the refuge has now acquired lands within the acquisition boundary, it can prohibit vehicle use and road construction in certain areas so as to minimize these types of impacts.

No impact is expected on the West Virginia northern flying squirrel, another State species of concern, because this species mostly occurs in upland forested habitat, where fishing generally does not occur.

Anticipated disturbances to wildlife are likely to be short term and infrequent based on staff observations of low interest in fishing remote areas of the refuge. Because much of the refuge, particularly the remote beaver ponds and river corridors, is not stocked with game fish, interest in fishing these areas is generally low. Sedimentation impacts will likely be minor from foot travel. Long-term impacts may include certain wildlife species avoiding trail corridors as a result of this use. Over time, however, the use of trails for angler access is not significant compared to the use of trails for other approved uses and will not create significant cumulative effects on wildlife disturbance. Observations from refuge staff and anecdotal reports suggest that less than 10 persons per month fish the subject ponds in the northern portion of the refuge. Based on the staff observations on numbers of anglers and locations of fishing activities, it is not expected that disturbance impacts will be significant.

Effects on Threatened and Endangered Species: The Federally threatened Cheat Mountain salamander (*Plethodon nettingi)* is found on the refuge. This species is found associated with high elevation forested habitat,

typically with some component of red spruce (*Picea rubens*) and/or Eastern hemlock (*Tsuga canadensis*) and it is likely that it is restricted to the cooler mountain slopes and ridges. Primary access for fishing will occur only in the lower elevations and valley floor and will not traverse known or potentially occupied habitat of Cheat Mountain salamanders. Therefore, there are no adverse affects to this species as a result of allowing fishing access.

Indiana bats (*Myotis soldalis*) were documented on the refuge for the first time through acoustical monitoring conducted by the U.S. Forest Service in 2003 (Ford 2003). Indiana bats were found foraging at two locations in the south end of the refuge. The refuge began conducting acoustical surveys in 2005. These surveys have documented three likely Indiana bat observations in the same location as the 2003 survey during 2005, 2007, and 2008. Additionally, acoustical surveys documented one new location for the species during 2007. Indiana bat calls have been documented from the refuge in the months of May, July, August, and September. However, since fishing is restricted to day time hours, and must comply with the stipulations of this document, any potential negative effects on this nocturnal species are expected to be insignificant. We will periodically evaluate this activity to determine any effects it may have. In particular the use of roost trees near beaver ponds will be a concern and will be evaluated to determine if fishing created disturbance to roosting bats. If evidence of any adverse affects appears, the location(s) of activities will be curtailed or discontinued as needed.

User Conflicts: Conflicts between recreational uses are commonly reported in the literature (Chavez et al. 1993, Watson et al. 1994, Knight and Gutzwiller 1995, Ramthun 1995). Conflicts range from concerns over personal safety to certain user groups feeling that they should be given priority over other groups based on a past history or other reasons. In the 1997 National Wildlife Refuge System Improvement Act, there was no priority order given to the big six uses (hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation). Based on interviews with individuals and user groups, conflicts among groups are not significant in Canaan Valley. This is likely due to the relatively low number of visitors in the area as compared with heavy use at conflict sites reported in the literature.

Fishing is viewed as an effective and justifiable use that enables the public to discover, experience, and enjoy the refuge and participate in a priority public use. Potential habitat degradation from angler foot traffic and disturbance to breeding/nesting birds and wildlife species warrants monitoring. Due to the low level of fishing activity occurring on beaver ponds and rivers on the refuge, no significant impacts to refuge resources are anticipated. However if unanticipated impacts are noted, corrective actions will be taken to protect refuge resources.

Cultural Resources: There are no known cultural resources on or near the designated access points or any of the fishing areas mentioned in this compatibility determination. This use, as described, will not impact cultural resources.

PUBLIC REVIEW AND COMMENT

This compatibility determination was released concurrent with the draft Comprehensive Conservation Plan/ Environmental Assessment for a 45-day public review and comment period.

DETERMINATION (CHECK ONE BELOW):

_____ Use is not compatible

__**X**__ Use is compatible with the following stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

The refuge has developed a list of criteria for determining whether any given route would be appropriate for public use, including fishing. These criteria apply to current and future trails. Criteria are as follows:

Checklist for Existing Routes to Be Eligible for Compatibility Consideration
(Routes must meet all criteria)

1. Route provides an opportunity to view a variety of habitats and wildlife.
2. Route is safe for the access proposed at current use levels.
3. Route requires minimal annual maintenance (i.e., waterbars, stepping stones, etc.) to ensure safe access and to prevent further habitat degradation.
4. Route has a low potential for fragmenting habitat or disturbing wildlife populations.
5. Based on existing soils information, less than 50 percent of the route's length occupies soil types rated as high or very high for compaction and/or erosiveness. The route is not rated as severely limited for hiking trails based on the Tucker County Soil Survey.
6. Any route crossing of sensitive soils occupies the shortest possible distance. Organic soil crossings are minimized or eliminated.
7. Continued use of the existing route is not likely to cause further wetland alteration or degradation. There is low risk that hydrology, soil stability, sensitive plant communities, riparian zones, and wildlife habitats would be adversely affected.
8. Route predominately occupies modified substrate (graveled, compacted, or filled) like logging roads and rail grades.
9. Route is not incised greater than 1 foot deep over 10 percent of its total length.

Additional Stipulations for Fishing Access Include:

—Fishing is allowed during refuge open hours: between one hour before sunrise and one hour after sunset.

—No overnight parking or camping is permitted.

—No discarding monofilament line.

—Signs necessary for visitor information, safety, and traffic control are installed and maintained as necessary.

—The refuge conducts an outreach program to promote public awareness and compliance with refuge public use regulations.

—Fishing access is restricted to designated trails and access points. The designated access points are A-frame road, Delta 13 road, Old Timberline road, and Timberline road to access the Blackwater River.

—Anglers accessing the Blackwater River by watercraft enter the refuge from outside refuge boundaries or one of the designated access points on the refuge. The use of gasoline motors is prohibited on the refuge.

—Routes designated for public access are monitored annually to determine if they continue to meet the compatibility criteria. Biological inventories continue to provide baseline information to measure change. Should monitoring and evaluation of the use indicate that the compatibility criteria are or will be exceeded, appropriate action will be taken to ensure continued compatibility, including modifying or discontinuing the use.

—Refuge officer patrols include recording visitor numbers, vehicle numbers, visitor activities, and activity locations to document current and future levels of refuge use. Patrols also include the routine assessment of safety conditions and visitor interactions on refuge routes. Conditions that are or will risk public safety will be identified and appropriate action will be promptly taken to correct such conditions.

—The refuge conducts annual assessments of visitor perceptions of refuge uses and the management of access routes. A visitor survey is developed and conducted upon approval. Providing for safe public use through proper administration and regulation, public education, and law enforcement will be essential.

—The possession, use or collection of bait fish (including crayfish and amphibians) is prohibited anywhere on the refuge. Exotic fish introductions from bait fish, and movement of aquatic organisms between watersheds, has impacted native species and their habitats throughout the State.

—All anglers must possess a required State fishing license and must comply with all State fishing regulations (50 CFR. § 32.6(c)).

JUSTIFICATION

Fishing seasons and limits are established by the State and adopted by the refuge. These restrictions are designed to protect fish populations from overharvest. The refuge has established additional regulations and stipulations for refuge lands to protect fish, wildlife, and habitats from potential negative effects. Anticipated disturbances to wildlife will be short term and infrequent based on the current level of use. Sedimentation impacts from foot travel will be minor. Fishing access is limited to designated trails and access points to help minimize potential erosion, sedimentation, soil compaction, and vegetation trampling. Long-term impacts may include certain wildlife species avoiding trail corridors as a result of this use over time. However, the use of trails by anglers will be a minor component of the overall public use program which allows access on designated trails. Additionally, the effects will be limited to the trail corridor and there are larger areas off-limits to public access which will not be disturbed by this use. This ensures the refuge will continue to conserve and protect the wetlands of Canaan Valley as directed in its established purposes under the Emergency Wetland Resources Act (1986).

Based on the current level of fishing, wildlife disturbance impacts will not be significant. Because the majority of the refuge is not stocked with game fish and because it is difficult to access remote beaver ponds and river stretches, the level of fishing activity for most of the refuge is not expected to increase significantly. To minimize effects on native species, harvest or use of bait fish, crayfish, and amphibians is not authorized on refuge lands. This refuge-specific regulation will help ensure the ecological integrity of Canaan Valley as directed by the 1979 EIS.

Observations from refuge staff and anecdotal reports suggest that less than 10 persons per month fish the subject ponds in the northern portion of the refuge. Because of the relatively low level of use and no expectation of a significant increase in use, there will be no significant adverse impacts from wildlife disturbance and compaction of soil and vegetation. When conducted in the manner prescribed at the current use level, fishing will not adversely affect refuge resources or public safety. Given the low density of anglers, conflicts between anglers and other users are minimal, and are addressed through law enforcement, public education, and review and updating of State and refuge regulations as needed.

The majority of the fish that are caught on the refuge are non-native species that are stocked by the State on streams and tributaries outside the refuge boundary. These stocked species are further supplemented by hatchery releases. The State designs its fish stocking program to ensure that there are surplus fish populations to withstand fishing pressure. Therefore, public fishing on the refuge contributes to a balanced conservation program, is operated under sound principles of fishery management, and does not prevent the refuge from conserving or protecting the fish and wildlife resources of the refuge. Stipulations reduce wetland impacts by restricting stream and pond access to public use trails. Wildlife disturbance will be limited to the trail and stream corridors and peripheral areas of beaver ponds which are adjacent to public use trials. There are stream

and pond habitats which are not accessible by public use trail and therefore provide habitat for wildlife and wetland plants which will be unaffected by this use.

With the access stipulations provided, the use will not have significant effects on the protection and conservation of wetland resources or the protection and management of migratory birds which will ensure the refuge meets requirements for the Wetland Resources Act (1986) and the Migratory Bird Conservation Act (1929). Since access methods are restricted and observed use is low, it is unlikely that continued public fishing will affect the ability of the refuge to protect, restore, and manage wildlife and their habitats, as directed by the Fish and Wildlife Act of 1956. As long as it is conducted according to the stipulations listed above, fishing will not materially interfere with the refuge purposes of ensuring the ecological integrity of the Canaan Valley, conserving and protecting fish and wildlife resources, conserving wetlands, and protecting migratory birds. Fishing also supports the mission of the Refuge System by providing resource benefits to the American people.

Allowing fishing furthers the mission of the Refuge System by providing access to renewable natural resources for the benefit of the American public while conserving fish, wildlife, and plant resources on the refuge. For the reasons stated above, fishing will not materially interfere with or detract from the mission of the Refuge System or the purposes for which the refuge was established. Monitoring will be conducted to ensure this use remains compatible. If significant impacts are found, corrective actions will be taken to protect refuge resources.

SIGNATURE:

Refuge Manager: Kenneth R. Stein Acting (Signature) 2/14/2011 (Date)

CONCURRENCE:

Regional Chief: Anthony D Léger (Signature) 02/25/2011 (Date)

MANDATORY 15 YEAR RE-EVALUATION DATE: 02/25/2026

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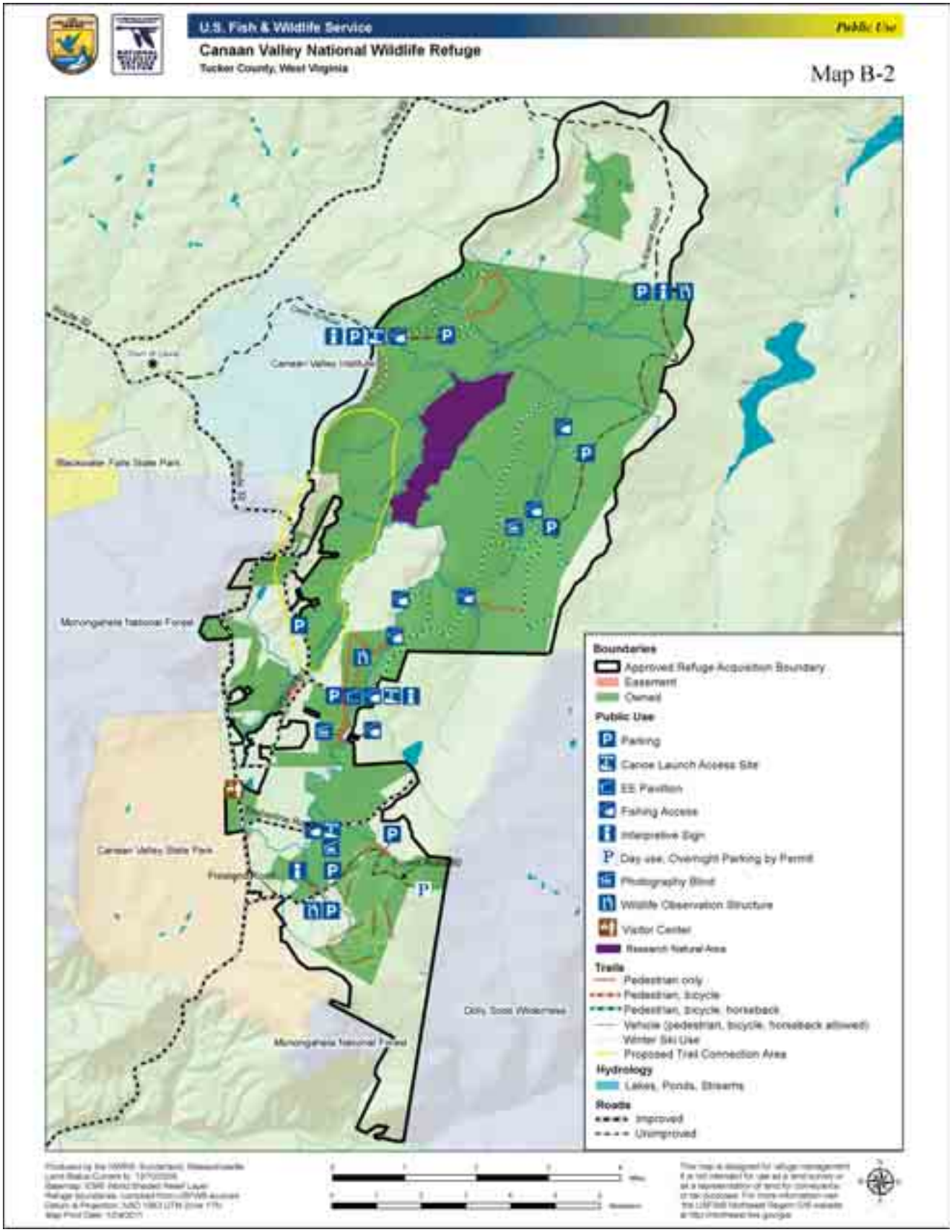
Attachment: Map B-2. Public Use


U.S. Fish & Wildlife Service
Canaan Valley National Wildlife Refuge
Tucker County, West Virginia
Map B-2
Blackwater Falls State Park
Monongahela National Forest
Canaan Valley State Park
Dolly Sods Wilderness
Boundaries
Approved Refuge Acquisition Boundary
Easement
Owned
Public Use
Parking
Canoe Launch Access Site
EE Pavilion
Fishing Access
Interpretive Sign
Day use, Overnight Parking by Permit
Photography Blind
Wildlife Observation Structure
Visitor Center
Research Natural Area
Trails
Pedestrian only
Pedestrian, bicycle
Pedestrian, bicycle, horseback
Vehicle (pedestrian, bicycle, horseback allowed)
Winter Ski Use
Proposed Trail Connection Area
Hydrology
Lakes, Ponds, Streams
Roads
Improved
Unimproved

COMPATIBILITY DETERMINATION

USE

Wildlife Observation, Photography, Environmental Education, and Interpretation

REFUGE NAME

Canaan Valley National Wildlife Refuge

DATE ESTABLISHED

August 11, 1994

ESTABLISHING AND ACQUISITION AUTHORITY(IES)

The establishment of Canaan Valley National Wildlife Refuge (refuge) was first approved in an Environmental Impact Statement (EIS) released on May 30, 1979. However, the U.S. Fish and Wildlife Service (Service) decided to await the outcome of litigation surrounding a proposed storage hydroelectric facility before pursuing any further action. The approval of the refuge was affirmed by the Service in a 1994 Final Environmental Assessment and Finding of No Significant Impact on July 11, 1994, which confirmed the adequacy of the previously approved 1979 EIS. The refuge was officially established when the first tract of land was acquired on August 11, 1994. The Service has acquired lands for the Canaan Valley refuge under the following authorities:

1. Fish and Wildlife Act of 1956 [16 U.S.C. 742f(a)(4)]
2. Emergency Wetlands Resources Act of 1986 [16 U.S.C. 3901b]
3. Migratory Bird Conservation Act of 1929 [16 U.S.C. 715d]

REFUGE PURPOSE(S)

The refuge was established to ensure the ecological integrity of Canaan Valley and the continued availability of its wetland, botanical, and wildlife resources to the citizens of West Virginia and the United States (USFWS 1979, 1994). Additional refuge purposes derived from the legislative authorities are as follows:

(1) "... for the development, advancement, management, conservation, and protection of fish and wildlife resources..." (Fish and Wildlife Act of 1956; 16 U.S.C. 742f(a)(4));

(2) "... for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions." (Emergency Wetlands Resources Act of 1986; 16 U.S.C. 3901(b)); and,

(3) "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (Migratory Bird Conservation Act of 1929; 16 U.S.C. 715d).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

The mission of the National Wildlife Refuge System (Refuge System) is "to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." 16 U.S.C. 668dd(a)(2) (National Wildlife Refuge System Improvement Act of 1997).

DESCRIPTION OF USE

(a) What is the use? Is it a priority public use?
The uses are wildlife observation and photography, environmental education and interpretation accessed by walking or hiking on established roads and trails, or by using non-motorized boats. Wildlife observation, photography, environmental education, and interpretation are priority uses of the Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57). While boating is not a priority public use, it facilitates visitor participation in all six priority public uses (fishing, hunting, wildlife observation, photography, environmental education, and interpretation).

Other Supporting Uses: Vehicular Use, Horseback riding, Bicycling, Cross-country skiing, and Snowshoeing, are addressed separately in individual compatibility determinations.

(b) Where will these uses be conducted?
These uses have been allowed and will continue to be allowed on designated roads and trails in all Service-owned areas open to the public. These areas include, but are not limited to the nearly 30 miles of existing designated roads and trails listed below (see Map B-2 for trail locations:

Forest Road (FR) 80 - 2.2 miles
Idleman's Run Road - 0.2 miles
Idleman's Run Trail - 0.4 miles
Freeland Trail - 0.24 miles
Beall Trails - 4.5 miles
Swinging Bridge Trail - 1.1 miles
Brown Mountain Trail - 2.4 miles
Brown Mountain Overlook Trail- 2 miles
A-Frame Road - 4.8 miles
Cabin Mountain Trail - 2 miles
Cabin Mountain Spur - 0.8 miles
Sand Run Trail - 0.9 miles
South Glade Run Crossing - 0.8 miles
Middle Valley Trail - 6.2 miles
Blackwater View Trail - 1.4 miles
Founder's (Valley) Overlook - 0.1 miles

In the Comprehensive Conservation Plan (CCP), the following trails are added to increase connections between existing trails on the refuge:

- Connect Beall Trails to Middle Valley Trail
- Connect Brown Mountain Overlook to Camp 70 Loop to make a large loop
- Coordinate with Canaan Valley Institute and other partners to connect Swinging Bridge trail to Cortland Road

The refuge will evaluate the effects and alternatives to these additional trails in a separate EA. Trail construction and location criteria will follow the conditions established for the existing trail system and will be evaluated based on established trail criteria presented in Stipulations for Compatibility.

The refuge permits access on Service-owned lands for non-motorized boats on the Blackwater River and associated tributaries. This CCP calls for improving existing launch sites.

Any of the above uses may also be allowed on any additional lands acquired by the Service in the future.

(c) When will the uses be conducted?
These uses occur throughout the year when the refuge is open to the public. Currently the refuge is open daily from one hour before sunrise until one hour after sunset.

(d) How will the uses be conducted?
Visitors enter the refuge at public entry points or drive to refuge parking areas and walk from there. To participate in these activities, visitors may park vehicles at refuge parking areas, along the shoulders of designated refuge roads and trails, and along public roads.

Wildlife observation and photography occur on an individual or group basis. To accommodate other users and promote a positive wildlife observation experience, we encourage smaller group sizes (i.e., less than 10 members).

Information kiosks identify the roads and trails open for travel and explain permitted public uses. Designated wildlife observation trails on the refuge are described and interpreted in the trail brochures. As trail connections are made, refuge brochures and kiosks will be updated to show all designated trails. Parking lots and kiosks have been constructed at the trailheads of refuge trails.

Boating access is currently provided by allowing hand launch and retrieval of small, non-motorized water craft where accessible.

Contingent on available staffing and funding, the CCP also calls for expanding or enhancing these four priority public uses through a variety of methods, including but not limited to:

A. Wildlife Observation and Photography

- If the refuge gains ownership over the portion of Camp 70 road that is within the refuge acquisition boundary, repair and maintain the road as a trail open to pedestrian, equestrian, and bicycle use.
- Allow overnight parking, by permit, at the top of Forest Road (FR) 80 to access the Dolly Sods Wilderness Area.
- Construct an interpretive kiosk and parking area where A-frame Rd. enters the refuge.
- Construct a photo/observation blind along the trail at the end of A-Frame Rd.
- Improve existing boat launch sites and create two new ones,

B. Interpretation

- Increase the number of on-site and off-site interpretive programs.
- Develop the Freeland Trail as a self-guided interpretive trail.
- Provide guided interpretive programs to the refuge's Research Natural Area that highlight the wetland ecosystem of Canaan Valley.

- Develop additional interpretive signs for other trails and kiosks.
- Develop a professional traveling exhibit.
- Create a larger meeting room in the vicinity of the visitor center.
- Open the visitor center daily during times of peak visitation.
- Recruit work camper volunteers and local and part-time resident volunteers to staff the visitor center.

C. Environmental Education

- Conduct increased outreach to area schools about opportunities to use the refuge and its library.
- Increase outreach efforts to communities that are within an hour's drive of the refuge.
- Present six to eight programs in the schools per year.
- Develop and present environmental education workshops for teachers, in line with State education standards.
- Construct an environmental education pavilion on the Beall Trail in the vicinity of the Blackwater River.

(e) Why are these uses being proposed?
The National Wildlife Refuge System Improvement Act defines wildlife observation, photography, environmental education, and interpretation as priority public uses that, if compatible, are to receive our enhanced consideration over other general public uses. Authorizing these uses will provide opportunities for the public to enjoy wildlife and plants on the refuge in accordance with law, and it will produce better-informed public advocates for Service programs.

These uses will provide opportunities for visitors to observe and learn about wildlife and wild lands at their own pace in both structured and unstructured environments, and observe wildlife in their natural habitats firsthand. These four priority uses provide visitors with opportunities to enjoy refuge resources and gain a better understanding and appreciation of fish and wildlife, wild lands ecology, the relationships of plant and animal populations in an ecosystem, and wildlife management. These activities will enhance public understanding of natural resource management programs and ecological concepts, enable the public to better understand the problems facing our wildlife and wild lands resources, help visitors to better understand how they affect wildlife and other natural resources, and learn about the Service's role in conservation and restoration.

Photographers will gain opportunities to photograph wildlife in its natural habitat. These opportunities will increase the publicity and advocacy of Service programs. Photography provides wholesome, safe, outdoor recreation in a scenic setting, and entices those who come strictly for recreational enjoyment to participate in the educational facets of our public use program and become advocates for the refuge and the Service.

Visitors need a way to access these priority uses. By allowing visitors to walk, hike, and use non-motorized boats in designated areas of the refuge, we are providing access to these important priority public uses with minimal impacts to sensitive wildlife and habitat.

AVAILABILITY OF RESOURCES

The following list estimates the required costs for the refuge to administer and manage its current programs for wildlife observation and photography, environmental education and interpretation. They do not include the costs of new construction, kiosks, signs and other costs associated with the CCP. These costs are described

in appendix E in a Refuge Operating and Needs and Service Asset Maintenance Management System data list. They also do not cover un-anticipated costs such as participation in search and rescue operations. The refuge officer is the primary contact for any emergency operations on the refuge, however local resources are available to assist and provide significant resources if necessary. Because such an incident is uncommon and unpredictable, these costs are not assumed in the resources estimate below.

COSTS

Staff time associated with administration of this use is related to assessing the need for road and trail maintenance and repair, maintaining kiosks, maintaining gates, maintaining traffic counters and recording collected data, maintaining sign-posting roads and trails, informing the public about new refuge uses, conducting visitor use surveys, analyzing visitor use patterns, monitoring the effects of public uses on refuge resources and visitors, and providing information to the public about the use. Boating costs are included in these costs.

Annual costs associated with the administration of trail use on the refuge are estimated below:

Road maintenance and repair: (filling significant potholes, maintaining water bars, cleaning culverts, brush clearing) sign installation and repair, trail evaluation and planning

- WG-10 Equipment Operator for 28 work days = $7361.68

Planning trail connections, working with partners

- GS-13 Refuge Manager for 21 working days = $9455.04

Planning and monitoring road conditions and supervising staff to monitor pedestrian travel and its effects on environment and other visitors

- GS-11/12 Deputy Refuge Manager for 7 work days = $2128.50

Law enforcement, monitoring trail users and their interactions with each other, visitor services, and sign maintenance needs while conducting other LE activities.

- GS-9 Refuge Officer for 40 work days = $9830.40

Monitoring environmental effects of pedestrian travel

- GS-12 Wildlife Biologist for 7 work days (training & inspection) = $2572.64,
- GS-11 Wildlife Biologist for 14 work days (monitoring) = $4161.92
- GS-7 Biological Science Technician for 14 work days (monitoring) = $2812.32

Providing information to the public, working with and training Adopt a Trail volunteers, evaluating and planning trail improvements, and analyzing traffic counter and user data

- GS-11 Park Ranger for 20 work days = $7060.80

Vehicle fuel / law enforcement patrols = $1000

Heavy equipment fuel = $600

Total Estimated Costs = $46,983.30

FY 2009 Budget Allocations:

Employee Salaries and benefits = $624,039.53
Fixed costs (utilities, fuel, administrative) = $211,415.23
Base maintenance = $50,000
Discretionary Funds (maps, printing, etc.) = $62,243.32
Total Available Funds for FY 2009 = $947,698.08

The financial and staff resources necessary to provide and administer these uses at their current levels are now available. We expect the resources to continue in the future, subject to availability of appropriated funds. As stated above, we will need additional resources to expand and enhance these uses as described in the CCP.

ANTICIPATED IMPACTS OF THE USE

Following are descriptions of potential adverse effects on natural resources of wildlife observation, photography, environmental education, and interpretation accessed by walking, hiking, and non-motorized boating in authorized areas within the refuge. Effects of other modes of access (e.g., snow-shoeing, cross-country skiing) are addressed in separate documents.

Effects on Hydrology and Water Quality: Visitor use has the potential to contaminate the Blackwater River and its tributaries through soil sedimentation from hiking, canoeing, and kayaking into streams and runoff of petroleum products from parking lots. Plans for new visitor trails, an observation platform along A-Frame Road, an environmental education pavilion, and parking lot construction may also cause short-term adverse impacts from soil runoff and sedimentation into the refuge's water resources. A more detailed discussion of the impacts of these construction projects will be addressed in a subsequent environmental assessment.

Foot travel—The refuge minimizes adverse effects on water resources in a variety of ways. Refuge staff routinely monitor roads and trails for damage and remediate problem areas as needed. There may be additional impacts to water resources where new trails cross the refuge's rivers, streams, and tributaries increasing the potential short-term and long-term downstream erosion and sedimentation. However, the refuge will maintain trails to minimize erosion and adverse impacts to hydrology and water quality. Additional visitor use also increases the potential for contaminating rivers, streams, and open water through the runoff of petroleum products from parking lots. Refuge parking lots are not located directly adjacent to streams, rivers, or other wetlands. Additionally, parking lots are graveled and are therefore more porous than impervious surfaces such as tar.

The construction of boardwalks on some trails may result in short-term localized effects to hydrology and water quality during construction. By providing a path for users to cross over the wetlands and not through them, long-term adverse effects to hydrology and water quality will be minimized.

Boating—The refuge is planning to provide improved boat launch sites, which will benefit water resources as a whole by concentrating use to specific locations; however, adverse impacts may be observed at these sites. Increasing boat access increases the risk of spreading aquatic invasive species in refuge waterways and increases the risk of stream bank erosion and siltation. In addition, an increase in recreational boating activities might lead to river and stream contamination from trash and surface run off. By improving these launch sites, the refuge will minimize risks of stream bank erosion and siltation into refuge waterways. Public outreach will

notify those visitors of proper precautions, including carrying out all trash and methods to reduce the spread of aquatic invasive species. Refuge law enforcement will also contact boaters to provide information on aquatic invasive species and monitor launch areas for invasive infestations. This will help minimize risks associated with visitor use of waterways on the refuge.

Effects on Vegetation: To facilitate wildlife observation, photography, environmental education, and interpretation, we will allowing hiking access and boating access on designed roads and trails. Short-term effects consist of the deterioration of plant material, whereas long-term effects of trampling include direct and indirect effects on vegetation and soils like diminishing soil porosity, aeration and nutrient availability through soil compaction (Kuss 1986, Roovers et al. 2004). Compaction of soils thus limits the ability of plants, particularly rare and sensitive species, to revegetate affected areas (Hammitt and Cole 1998). Kuss (1986) found that plant species adapted to wet or moist habitats are the most sensitive and increased moisture content reduces the ability of the soil to support recreational traffic. Where adverse impacts to vegetation are observed, the refuge will take necessary measures, such as remediation and trail closures, to restore plant communities.

It is anticipated that allowing use on designated routes will cause some vegetation loss. Foot travel may increase root exposure and trampling effects, however it is anticipated that under current and projected use the incidence of these problems will be minor. Designated routes for pedestrian travel consist of former logging roads with hardened surfaces or are existing trails that have been used for many years. Designated routes do not have any known occurrences of rare plant species on their surface or soils subject to compaction that will be impacted by this use. Some rare plants have been documented in habitat adjacent to trails. Users leaving designated trails could have impacts to adjacent vegetation. Trails will be monitored, problem areas will be identified, and appropriate restoration and protection efforts will be made.

Boating—Boating may adversely affect vegetation in several ways. Direct impacts on vegetation can result from portaging boats over stream banks and through wetland vegetation. Riparian soils and habitat are sensitive, and negative effects on vegetation are likely to occur along stream and river banks where visitors launch canoes, kayaks, and other non-motorized boats. To help protect sensitive riparian vegetation, the CCP calls for the improvement of existing boat launch sites. Improvement will primarily focus on adding gravel to small sections of the bank to create a stable launch area and creating small gravel parking areas nearby. Refuge boat access sites and trails will be located away from sensitive wetlands, peat lands, and rare plants. Habitat features important for trout, such as overhanging banks, will also be protected from disturbance. These efforts will help mitigate risks associated with visitor use of waterways on the refuge.

Effects on Soils: Trail use on the refuge could adversely impact soils through compaction, erosion, and sedimentation.

Foot travel—Soils can be compacted and eroded as a result of continued use of pedestrian routes. The Mauch Chunk-derived soil in Canaan Valley is particularly vulnerable to mechanical erosion when the vegetation has been removed (Rizzo 2002). If compacted, Mauch Chunk soils can facilitate rapid water runoff that accelerates erosion down slope (Rizzo 2002). Although it is unlikely foot travel will create highly erosive conditions, lug soles on hiking boots can exacerbate the problem.

There will be localized soil compaction and loss of productive soil where soils are removed or surfaced for observation platforms, environmental education pavilion, parking lots, kiosks, roads, and trails and in adjacent areas where vehicles and heavy equipment are used for site access and preparation work. These impacts will constitute unavoidable adverse impacts from refuge infrastructure improvements but will be short-term and temporary as restoration and revegetation of construction sites will be prioritized. Additionally, trail construction projects may cause temporary disturbance to improve trails but will lead to more stable and sustainable trails over the long term.

Construction and maintenance of trails will result in short-term and long-term adverse impacts to soils. To provide connectivity to already existing trails, three new trails are planned. In cases where exact trail location has not been determined, the refuge plans to use existing logging roads and avoid wetlands where possible to minimize the impact from and extent of new trail development. New trail construction, estimated at no greater than 7.5 miles, will cause short-term impacts to soils. Impacts of new trail construction will be evaluated in a supplemental environmental assessment.

The creation of a boardwalk to connect Camp 70/Delta 13 trail to Brown Mountain Overlook trail will create short-term direct impacts to soils through trail construction. No construction other than placement of boardwalk pilings will be done in wetlands so there will be short-term localized effects to wetland soils during construction and potential for long-term impacts on wetland plants from the shading effect produced by the boardwalk itself. The purpose of the boardwalk is to provide a new trail connection which will help prevent greater long-term negative impacts to sensitive wetlands soils. By providing a path for users to cross over the wetlands and not through them, long-term effects to unsuitable and highly compactable soils will be avoided.

Over the long-term, the risk of erosion and sedimentation problems that might affect soils in these habitats will increase with increased visitor usage and trail use. At current levels the trail system supports hiking. Wetland complexes adjacent to active trails, like the Middle Valley trail and South Glade Run Crossing trail, would be of particular concern as degradation from hiking would increase the potential for soil compaction, erosion, and sedimentation into adjacent wetlands and streams. Trail surveys completed in 2002 and again in 2005 showed an improvement in trail conditions. For example, following refuge acquisition and as a result of initial trail maintenance, instances of erosion dropped by 58 percent and number of bootleg trails dropped by 38 percent. This indicates that the current level of trail use and maintenance results in a sustainable level of trail use. In fact, trail conditions have improved relative to when the refuge first acquired the property. Future monitoring efforts will document trail conditions to focus management actions on locations which will minimize erosion and sedimentation as a result of public use activities.

Boating—Soil impacts related to boating are confined to launch sites. Riparian soils and habitat are sensitive, and soil erosion and compaction are likely to occur along stream and river banks where visitors launch canoes, kayaks, and other non-motorized boats. To minimize negative effects associated with boating, the CCP calls for the designation and improvement of two to three boat launch sites. Improvement will primarily focus on adding gravel to small sections of the bank to create a stable launch area and creating small gravel parking areas nearby. Impacts of creating new boat launch sites will be evaluated in a supplemental environmental assessment.

Effects on Wildlife: Short-term and long-term adverse impacts will be expected for wildlife populations in relation to increasing trail miles and visitor use. Disturbances will vary by wildlife species involved and the type, level, frequency, duration, and the time of year activities occur. Beale and Monaghan (2004) found that adverse effects to wildlife increase as number of users increase. The study found that an animal's response to one visitor walking down a trail is entirely different than its response to a group of users walking down a trail. The refuge recognizes that large group sizes may amplify negative effects to wildlife. Therefore, groups larger than 10 are required to notify the refuge prior to visiting to determine if a special use permit would be needed. This will enable the refuge to understand which trails are preferred by large groups, and to monitor any potential excessive wildlife disturbance created by large groups. Having the ability to monitor these kinds of disturbances will also enable the refuge to mitigate impacts associated with large groups. Examples of mitigation may include directing large groups to less sensitive habitats during breeding seasons or assigning refuge staff to lead or meet with the group while on refuge lands.

Disturbance can cause shifts in habitat use, abandonment of habitat and increased energy demands on affected wildlife (Knight and Cole 1991). Miller et al. (1998) found bird abundance and nesting activities (including nest success) increased as distance from a recreational trail increased in both grassland and forested habitats. In this study, common species (e.g., American Robins) were found near trails and rare species (e.g., Blackburnian warblers) were found farther from trails. In some cases there is a clear link between the extent of disturbance and either the survival or reproductive success of individuals (e.g., Schulz and Stock 1993), but in many cases disturbance acts in a more subtle way, by reducing access to resources such as food supplies or nesting sites (Gill et al. 1996). Bird flight in response to disturbance can lower reproductive success by exposing individuals and nests to predators. For recreation activities that occur simultaneously (hiking, biking, and horseback riding) there will likely be compounding negative impacts to wildlife (Knight and Cole 1991).

There is evidence to suggest that species most likely to be adversely affected are those where available habitat is limited thus constraining them to stay in disturbed areas and suffer the costs of reduced survival or

reproductive success (Gill et al. 2001). Because of the diversity of habitats represented on the refuge, its rural setting, and adjacency to large tracts of protected lands, any population level effects to wildlife species from trail use might be minimized by the abundance of habitat on the refuge and adjacent lands. Additionally, trail development has striven to avoid sensitive habitats and extensive open areas to reduce the effects of disturbance to wildlife on the refuge. Spreading the disturbance within the most common habitat type on the refuge, and the most common habitat type regionally, further reduces the overall effect on wildlife tied to that habitat.

Wildlife disturbance may be compounded by seasonal needs. For example, causing mammals to flee during winter months would consume stored fat reserves that are necessary to get through the winter. Hammitt and Cole (1998) found white-tailed deer females with young are more likely to flee from disturbance than those without young. Some species, like warblers, would be negatively affected by disturbance associated with bird watching particularly during the breeding season.

For songbirds, Gutzwiller et al. (1994) found that low levels of human intrusion altered the singing behavior of some species. Disturbance may also affect the reproductive fitness of males by hampering territory defense, mate selection, and other reproductive functions of vocalizations (Arrese 1987). Disturbance, which leads to reduced singing activity, makes males rely more heavily on physical deterrents, which are time- and energy-consuming in defending territories (Ewald and Carpenter 1978).

Birds are not the only species that may be adversely affected by human disturbance. Short-term localized adverse impacts to fish populations may result from refuge construction and restoration projects that might cause soil erosion and sedimentation into refuge waterways. Long-term adverse impacts from increased trail miles and trail use might pose another concern to refuge fisheries. Trails that have stream and river crossings will likely degrade over time with increased use and contribute to downstream sedimentation and turbidity, which has been found to be a stressor to brook trout (Sweka and Hartman 2001) and redside dace (Holm and Crossman 1986) populations that are sensitive to habitat degradation. The refuge will monitor stream and river crossings closely and remediate any damaged areas to minimize adverse impacts associated with trail use.

West Virginia northern flying squirrels have been documented on refuge property near the end of FR 80. This species has recently been removed from the endangered species list. The recovery plan (USFWS 2001) notes that habitat modification may create a competitive advantage for the southern flying squirrel (*Glaucomys volans*), although the extent to which a logging road or trail would create conditions conducive for this are unknown. Some research has found northern flying squirrels occupying den sites near logging roads, skid trails and on hiking trails (Ford 2002).

Refuge visitors who choose to boat may cause localized, minor, short-term impacts by disturbing the bottom substrate in shallow water. In addition, discarded items such as plastic containers present a risk for waterfowl and other birds.

We will take all necessary measures to minimize all of these impacts, particularly where group educational activities are involved. We will evaluate the sites and programs periodically to assess whether they are meeting the objectives, and to prevent site degradation. If evidence of unacceptable adverse impacts appears, we will rotate the activities to secondary sites, or curtail or discontinue them. We will continue to close areas seasonally around active bird nesting sites to minimize human disturbance. We will post and enforce refuge regulations, and establish, post, and enforce closed areas.

Effects on Threatened and Endangered Species: There are two Federally listed species known to occur on the refuge, and one species that has recently been de-listed, as described in the previous subsection. Cheat Mountain salamanders (*Plethodon nettingi*), listed as threatened, have been documented near the upper section of FR 80, and near the cross-country ski trails in that area. Indiana bats (*Myotis sodalis*), listed as endangered, are known to use the refuge's forested areas for summer foraging and may have a summer maternity colony on refuge lands as well. The refuge requested Section 7 informal consultation with the Service's West Virginia Field Office under the Endangered Species Act (16 U.S.C. 1536) on all the actions in this CCP, including wildlife observation, photography, environmental education and interpretation, that could potentially impact listed

species. This process resulted in a finding that the actions called for in the CCP are not likely to adversely affect the listed species or their associated habitats on the refuge. The full Intra-Service Section 7 Biological Evaluation form can be found in appendix I of this CCP.

Cheat Mountain salamanders—This species is sensitive to any habitat changes that remove a forest canopy or reduce soil moisture and relative humidity. According to Pauley (1991), trails that receive heavy use resulting in bare trail treads could limit movements of Cheat Mountain salamanders and interfere with reproduction. Consequently, the refuge limits the use of trails near Cheat Mountain salamander habitat to winter cross-country skiing. For impacts to salamanders from cross-country skiing and snowshoeing, see the compatibility determination that addresses those uses. We are not proposing any changes to current activities on Cheat Mountain salamander habitat, so no adverse impacts are expected with these visitor uses. Also, we do not anticipate any adverse impacts from use associated with boating since there are no navigable waters in the area where this species is known to occur.

Indiana Bats—Based on the bat call surveys, the refuge appears to provide foraging and roosting habitat for Indiana bats during the summer and fall, but no known hibernacula or maternity colonies exist in Canaan Valley. We are planning to continue mist net surveys to assess the status of Indiana bats within the refuge. If maternity and roosting colonies do exist or are likely to become established on the refuge, disturbance from visitor use could adversely affect Indiana bats. If roosting colonies are discovered locations for public uses will be chosen to avoid these sites. We will periodically evaluate sites and programs to assess whether objectives are being met and to prevent site degradation.

Routes designated for these uses are pre-existing roads and trails, some of which have been in existence for many years. No new habitat clearing will be required to accommodate visitor activities; however some vegetation clearing will be required for maintenance within trail corridors. Similar to the Cheat Mountain salamander, we anticipate that these are not likely to adversely affect Indiana bats because these activities do not coincide with the area where this species is known to occur.

As described, these public uses are not likely to adversely affect threatened or endangered species.

PUBLIC REVIEW AND COMMENT

This compatibility determination was released concurrent with the draft Comprehensive Conservation Plan/ Environmental Assessment for a 45-day public review and comment period.

DETERMINATION (CHECK ONE BELOW):

_____ Use is not compatible

__**X**__ Use is compatible with the following stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

The refuge has developed a list of criteria for determining whether any given route would be appropriate for public wildlife observation, wildlife photography, environmental education or interpretation. These criteria apply to current and future trails. Criteria are as follows:

Checklist for Existing Routes to Be Eligible for Compatibility Consideration
(Routes must meet all criteria)

1. Route provides an opportunity to view a variety of habitats and wildlife.

2. Route is safe for the access proposed at current use levels.

3. Route requires minimal annual maintenance (i.e., waterbars, stepping stones, etc.) to ensure safe access and to prevent further habitat degradation.

4. Route has a low potential for fragmenting habitat or disturbing wildlife populations.

5. Based on existing soils information, less than 50 percent of the route's length occupies soil types rated as high or very high for compaction and/or erosiveness. The route is not rated as severely limited for hiking trails based on the Tucker County Soil Survey.

6. Any route crossing of sensitive soils occupies the shortest possible distance. Organic soil crossings are minimized or eliminated.

7. Continued use of the existing route is not likely to cause further wetland alteration or degradation. There is low risk that hydrology, soil stability, sensitive plant communities, riparian zones, and wildlife habitats would be adversely affected.

8. Route predominately occupies modified substrate (graveled, compacted, or filled) like logging roads and rail grades.

9. Route is not incised greater than 1 foot deep over 10 percent of its total length.

Additional stipulations that will apply to ensure compatibility include:

—Refuge regulations will be posted and enforced. Closed areas will be established as needed, posted, and enforced. Signs necessary for visitor information, safety, and traffic control will be kept up to date.

—The known presence of a threatened or endangered species will preclude any new use of an area until the refuge manager determines otherwise.

—Locations for public uses will be chosen to minimize impacts to wildlife and habitat. We will periodically evaluate sites and programs to assess whether objectives are being met and to prevent site degradation. If evidence of unacceptable adverse impacts appears, the location(s) of activities will be rotated with secondary sites, curtailed, or discontinued.

—Walking, hiking, and boating to facilitate wildlife observation, photography, environmental education and interpretation is only compatible on designated roads, trails, and waterways.

—Walking and hiking are restricted to refuge open hours: 1 hour before sunrise until 1 hour after sunset. Boat launching and retrieval from refuge lands are restricted to refuge open hours.

—Camping and overnight parking are currently prohibited. However this CCP calls for allowing overnight parking by special use permit at the end of Forest Road 80 to facilitate visitor access to non-refuge lands.

—The refuge conducts an outreach program to promote public awareness and compliance with public use regulations on the refuge.

—Group size is encouraged to be no more than 10 persons to promote public safety, accommodate other users, and reduce wildlife disturbance. Groups larger than 10 persons must contact the refuge office prior to visiting the trail system so the refuge can determine if the group will require a special use permit. Groups traveling only on roads shared with vehicles are not required to contact the refuge office or obtain a special use permit.

—All routes designated for public access are annually inspected for maintenance needs. Prompt action is taken to correct any conditions that risk public safety. Roads and trails are maintained at a level that reasonably accounts for safe travel. Roads are not plowed in winter.

—Guidelines to ensure the safety of all participants will be issued in writing to any special use permit holder for the activities and will be reviewed before the activity begins.

—Routes designated for public access are monitored periodically to determine if they continue to meet the compatibility criteria (listed above) established by the refuge. Should monitoring and evaluation of the use(s) indicate that the compatibility criteria are or will be exceeded, appropriate action will be taken to ensure continued compatibility, including modifying or discontinuing the use.

—Routine law enforcement patrols are conducted throughout the year. The patrols promote education and compliance with refuge regulations, monitor public use patterns and public safety, and document visitor interaction.

—Potential conflicts with other public uses such as hunting will be minimized by using trailhead signs and other media to inform the visitors about current public use activities as well as which activities are authorized in specific locations throughout the refuge.

JUSTIFICATION

Environmental education, interpretation, wildlife observation, and photography are all priority public uses and are to receive enhanced consideration on refuges, according to the Refuge Improvement Act of 1997. Providing increased wildlife-dependent recreational opportunities promotes visitor appreciation and support for refuge programs as well as habitat conservation efforts in Canaan Valley and elsewhere.

Environmental education and interpretation activities generally support refuge purposes and impacts can largely be minimized (Goff et al. 1988). Environmental education and interpretation are public use management tools used to develop a resource protection ethic within society. These tools allow us to educate refuge visitors about endangered and threatened species management, wildlife management, ecological principles and ecological communities. Environmental education and interpretation also instill an 'ownership' or 'stewardship' ethic in visitors. They strengthen Service visibility in the local community.

The majority of visitors to the refuge are there to view and/or photograph the wildlife and upland, wetland, and grassland habitat areas. Some visit to develop an understanding of natural or cultural history. This purpose is in accordance with a wildlife-oriented activity and is an acceptable secondary use. There will be some visitor impacts from this activity, such as trampling vegetation (Kuss and Hall 1991) and disturbance to wildlife near trails (Burger 1981, Klein, 1989); however stipulations to ensure compatibility will make these impacts minimal. For example, wildlife disturbance will be limited to the trail corridor that represents a fraction of the wildlife habitat available which will remain un-disturbed.

By allowing these uses on trails which have been evaluated by refuge staff to meet the criteria presented in this document, physical impacts to vegetation, soils, hydrology, wetland communities and ecological integrity of Canaan Valley will be minimized. Through proper trail maintenance these impacts will be further reduced. Hydrologic and soil impacts were generally inherited with refuge lands and are being remediated through routine maintenance operations. These uses will not affect the refuge's ability to restore impacted lands nor will they materially increase sedimentation, erosion or hydrologic impacts on refuge lands.

By limiting the uses to designated trails on a small percentage of the refuge and within the most common habitat type, disturbance will be limited and manageable. For this reason disturbance effects will not prevent the refuge from fulfilling the purposes of the Fish and Wildlife Act (1956) or the mission of the Refuge System for conserving, managing, restoring, and protecting wildlife resources. Through these measures the refuge still fulfills its obligations to ensure the biological integrity of the refuge's wildlife, plant and habitat resources. Since no public use trails occur on the lands acquired under the Migratory Bird Conservation Act of (1929), these uses will have no effect on the protection and management of migratory birds on those tracts. The stipulations reduce anticipated impacts and trails occupy predominately upland habitats so that these uses will not interfere with the refuge's ability to protect, manage and conserve the wetland resources or the wildlife as directed by the Emergency Wetland Resources Act (1986). Therefore these uses will not interfere with the refuge purposes of ensuring the ecological integrity of the Canaan Valley as directed by the 1979 EIS.

These uses will not have an effect on threatened or endangered species. No public use trails are open on lands which are occupied by threatened Cheat Mountain salamanders when they are active. The endangered Indiana bat is nocturnal and therefore these uses will not affect their foraging activities. No bat roosts have been documented on refuge land; however, if future information determines the presence of a roost or maternity colony which may be affected by these uses, the refuge will work with the Service's Ecological Services Office to ensure that no adverse affects will occur.

For the reasons discussed above, these uses will not affect the refuge's ability to conserve wetlands or protect, manage, and restore the wildlife and plant resources, as mandated through the Emergency Wetlands Resources Act (1986) and the Fish and Wildlife Act (1956), or the mission of the Refuge System. Since public use trails do not occur on lands acquired under the Migratory Bird Conservation Act (1929), these uses will not affect the refuge's ability to protect and manage migratory birds on those tracts. Based on this information, we have determined that environmental education and interpretation and wildlife observation and photography will not materially interfere with or detract from the mission of the Refuge System or the purposes for which the refuge was established.

SIGNATURE:

Refuge Manager: Kenneth K. Johnson /Acting _____ 2/14/2011 _____
(Signature) (Date)

CONCURRENCE:

Regional Chief: Anthony D Lega _____ 02/25/2011 _____
(Signature) (Date)

MANDATORY 15 YEAR RE-EVALUATION DATE: 02/25/2026

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COMPATIBILITY DETERMINATION

USE

Bicycling to Facilitate Priority Public Uses

REFUGE NAME

Canaan Valley National Wildlife Refuge

DATE ESTABLISHED

August 11, 1994

ESTABLISHING AND ACQUISITION AUTHORITY(IES)

The establishment of Canaan Valley National Wildlife Refuge (refuge) was first approved in an Environmental Impact Statement (EIS) released on May 30, 1979. However, the U.S. Fish and Wildlife Service (Service) decided to await the outcome of litigation surrounding a proposed storage hydroelectric facility before pursuing any further action. The approval of the refuge was affirmed by the Service in a 1994 Final Environmental Assessment and Finding of No Significant Impact on July 11, 1994, which confirmed the adequacy of the previously approved 1979 EIS. The refuge was officially established when the first tract of land was acquired on August 11, 1994. The Service has acquired lands for the Canaan Valley National Wildlife Refuge under the following authorities:

1. Fish and Wildlife Act of 1956 [16 U.S.C. 742f(a)(4)]
2. Emergency Wetlands Resources Act of 1986 [16 U.S.C. 3901
3. Migratory Bird Conservation Act of 1929 [16 U.S.C 715d]

REFUGE PURPOSE(S)

The refuge was established to ensure the ecological integrity of Canaan Valley and the continued availability of its wetland, botanical, and wildlife resources to the citizens of West Virginia and the United States (USFWS 1979, 1994). Additional refuge purposes derived from the legislative authorities are as follows:

(1) "... for the development, advancement, management, conservation, and protection of fish and wildlife resources..." (Fish and Wildlife Act of 1956; 16 U.S.C. 742f(a)(4));

(2) "... for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions." (Emergency Wetlands Resources Act of 1986; 16 U.S.C. 3901(b)); and,

(3) "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (Migratory Bird Conservation Act of 1929; 16 U.S.C. 715d).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

The mission of the National Wildlife Refuge System (Refuge System) is "…to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." National Wildlife Refuge System Improvement Act, 16 U.S.C § 668dd(a)(2).

DESCRIPTION OF USE

(a) What is the use? Is it a priority public use?
The use is bicycling. Bicycling is not a priority public use within the National Wildlife Refuge System.

(b) Where will these uses be conducted?
Bicycling is allowed on designated roads and trails on the refuge. Bicycling may also be allowed on any additional trails constructed or opened to the public through this Comprehensive Conservation Plan (CCP) or other appropriate regulatory process. See map B-2 for locations of bicycling trails.

(c) When will the uses be conducted?
Bicycle travel is authorized on designated roads and trails year-round. Daily use hours are from one hour before sunrise until one hour after sunset. This use may be restricted during the late-fall and winter when the refuge has priority, wildlife-dependent activities (like deer hunting) in progress. This helps ensure public safety and minimize user conflicts.

(d) How will the uses be conducted?
Cyclists either travel to the refuge by bicycle and enter at public entry points or transport bicycles by vehicle and depart from designated parking areas. Travel is limited to designated roads and trails, where road width can accommodate the safe passage of other users. Designated roads and trails also have sufficient viewing distance for bicyclists to detect the approach of other users and maneuver to accommodate them.

Information kiosks identify the roads and trails open for travel and explain permitted public uses. Current designated wildlife observation trails on the refuge are described in the trail brochure. As trail connections are made, refuge brochures and kiosks will be updated to show all designated trails. Parking lots and kiosks have been constructed at the trailheads of refuge trails.

Bicycling occurs on individual and group bases. To accommodate other users and promote a positive wildlife observation experience, we encourage smaller group sizes (i.e., 10 people or less). Groups larger than 10 persons must contact the refuge office prior to visiting the trail system so the refuge can determine whether the group will require a special use permit.

Refuge staff will continue to record visitor numbers seen during patrols, types of access, user interactions, and potential safety concerns. Safety and information signs will be installed and maintained as necessary. Designated roads and trails will be maintained in such a manner as is practical to minimize environmental effects such as erosion and sedimentation and to provide safe conditions for public access.

Additional trails also may be constructed or opened to bicycle use. A subsequent environmental assessment will evaluate the alternatives and effects of new trails on refuge resources. The refuge will minimize adverse impacts by using its trail/route checklist in the stipulations below to determine whether the existing or new trail meets established criteria and addresses impacts to soil compaction and erosion potential. If a trail does not meet the checklist criteria, appropriate modifications will be made to trail routes either by locating a more suitable site or adding infrastructure to minimize short-term, localized and long-term impacts to soils and other resources.

(e) Why are these uses being proposed?
One of the secondary goals of the Refuge System is to provide opportunities for the public to develop an understanding for wildlife wherever those opportunities are compatible. Many visitors participating in this

activity will be directly engaged in the priority public uses which are identified in the National Wildlife Refuge Improvement Act of 1997.

The use of bicycles provides increased opportunity for public participation in and access to priority public uses such as fishing, wildlife observation and photography, and environmental education and interpretation. Bicycling provides visitors with a way to view the refuge's diverse biological assets. This exposure may lead to a better understanding of the importance and value of the Refuge System to the environment and the American people. Bicycle access has been allowed on the refuge since the refuge was established in 1994, and was found to be compatible in a compatibility determination signed August 1, 2003.

AVAILABILITY OF RESOURCES

The resources necessary to provide and administer road and trail use are available within current and anticipated refuge budgets. Staff time associated with administration of this use is related to assessing the need for road and trail maintenance and repair, infrastructure maintenance, recording collected data, sign-posting roads and trails, informing the public about new refuge uses, conducting visitor use surveys, analyzing visitor use patterns, monitoring the effects of public uses on refuge resources and visitors, and providing information to the public about the use. These activities will be conducted in conjunction and are not additive to the activities outlined in the "Wildlife Observation and Photography," and "Environmental Education and Interpretation" compatibility determinations; therefore bicycling will not require additional staffing or resources.

ANTICIPATED IMPACTS OF USE

Bicycling has the potential to affect a variety of migratory and resident wildlife and their habitats. Possible negative effects include disturbing wildlife, removing or trampling vegetation, littering, vandalism, and entering closed areas. Refuge staff will monitor the impacts of this use on roads and trails to assess potential negative effects. The refuge trail monitoring plan evaluates physical impact monitoring of the trail bed including percent trail incision, exposed roots, and puddles. Additionally it measures numbers of "bootleg trails" and trail width. The established criteria are used to evaluate when the level of use or the way the public is using the trail becomes incompatible with the protection of the physical resources (soils, vegetation) the refuge is charged to protect. In the event of persistent disturbance to habitat or wildlife, the activity will be restricted or discontinued.

Effects on Hydrology and Water Quality: Visitor use has the potential to contaminate refuge wetlands, and the Blackwater River and its tributaries by introducing soil sedimentation from bicycling and runoff of petroleum products from parking lots into streams. Trail maintenance may cause short term erosion and sedimentation in area waters. There may be additional impacts to water resources where new trails cross the refuge's rivers, streams, and tributaries increasing the potential short-term and long-term downstream erosion and sedimentation. The impact of new trail development will be addressed in a subsequent environmental assessment. If visitor use increases over time the potential for contaminating rivers, streams, and open water through the runoff of petroleum products from parking lots can be expected to increase as well.

Roads and trails used for bicycle travel can affect the hydrology of an area, primarily through alteration of drainage patterns. Bartgis and Berdine (1991) note that roads and trails can divert water from their original drainage patterns in Canaan Valley. This results in some drainages receiving less water and therefore becoming drier, while others are forced to carry more water resulting in accelerated erosion and increased water levels. Zeedyk (2002) documented many instances in Canaan Valley where existing roads and trails were channeling water away from historical wetlands and in some cases causing erosion and sedimentation of bog and other wetland communities. These problems have profoundly if not irreversibly altered the extent, depths, characteristics and function of the wetlands on the Main Tract (Zeedyk 2002). The effects of these trails and roads were a direct result of vehicle use and road construction prior to the refuge's acquisition of the property. Since then measures have been taken to remediate erosion and sedimentation issues, particularly on trails that are open to public access. Furthermore, since the refuge has now acquired lands within the acquisition boundary, it can prohibit vehicle use and road construction in certain areas so as to minimize these types of impacts.

Many of the roads evaluated are not open to public use and have been or are planned to be restored to minimize hydrologic impacts. The old roads currently in public use were evaluated for their potential impact to wetland resources and their continued use will not substantially increase their historical impact to refuge wetlands. We will focus maintenance and restoration activities to ensure a quality public use experience. Routine maintenance to redirect water and repair existing erosion is required to sustain bicycling routes due to the erosive nature of some soils on refuge trails (Rizzo 2002, Zeedyk 2002). If access occurs when conditions are wet, bicycle tires can create narrow ruts in the trail bed. If this occurs on a slope, water will channel in these ruts and accelerate erosion. Trail work to move water off the trail bed and harden areas which are susceptible to erosion is necessary to mitigate this impact. Much of this work has been conducted since the 2002 evaluations by refuge staff and volunteers. Regular trail work is conducted to move water from the trail bed and reconstruct trails for proper drainage. This reduces the overall impact of the trail and the use of bicycles on the trail to the hydrology of refuge wetlands. This work is not additional to the regular annual maintenance required to facilitate other public access methods.

The refuge minimizes adverse effects on water resources in a variety of ways. Refuge staff routinely monitors roads and trails for damage and remediates problem areas as needed. Trail maintenance is conducted to help minimize negative effects associated with trail use. These activities include maintenance and creation of water bars to move water off the trail tread, hardening areas which are sensitive through rock placement, and brushing-in areas where "bootleg" trails are becoming evident. Through regular maintenance and proper trail construction techniques, refuge staff will ensure any potential negative effects are avoided or minimized

We anticipate that bicycle use could alter drainage features of roads and trails through erosion and compaction, potentially affecting water quality and hydrology in sections of the trail system where soils are more erosive. Tires may create trail incision causing increased water channeling and erosion during wet conditions. These problems will be minimized because routes designated for bicycle use are on existing logging and skid roads, and most have hardened surfaces (trails with embedded rocks) or already compacted soils. These routes are located predominately on upland soils to prevent impacts to fragile wetland soils. Because bicycle routes are permitted only on trails which are stable (typically all old logging road beds) and the trail maintenance is performed by the refuge staff and volunteers, adverse effects on water resources will be minimized.

Effects on Vegetation: Bicycle use can cause compaction of presently uncompacted soils, particularly when soils are wet, which can degrade plant communities associated with fragile organic soils. Soil compaction can diminish the soil porosity, aeration, and nutrient availability. These directly affect plant growth and survival (Kuss 1986). Compaction can also limit the re-colonization of areas due to increased difficulty for root growth and penetration in the affected soils (Hammitt and Cole 1998). Kuss (1986) found plant species adapted to wet or moist habitats are the most sensitive, and increased moisture content reduces the ability of the soil to support recreational traffic.

It is anticipated that bicycling will have some impacts on refuge plant communities growing on the designated travel routes by crushing the plants themselves. Designated routes for bicycle travel consist of former logging roads with hardened surfaces or are existing trails that have been used for many years. These routes are located predominately on upland soils to prevent impacts to fragile wetland soils and associated plant communities. Some rare plants have been documented in habitat adjacent to trails; however, rare plant species have not been found on the designated route surfaces themselves. Monitoring includes documenting off trail riding, which often creates "bootleg" trails. Often these trails develop when trail conditions deteriorate (muddy soil, puddles) or if a tree fall blocks the designated trail route. Impacts of off trail bike riding can be minimized through proper trail maintenance which keeps riders on designated trails and prevents vegetation impacts adjacent to trails. In the case of new trail construction, the refuge will follow the trail checklist to minimize impacts to refuge resources. A subsequent environmental assessment will evaluate the effects of proposed new trails on refuge resources.

Exposed soil and an abundance of sunlight along roads and trails provide ideal conditions for the establishment of invasive plant species. Bicycle use may impact vegetation and create bare soil conditions, thus creating conducive conditions for invasive species growth. Invasions result from the use of foreign material to construct and maintain roads and trails, and from seed transport via visitors and vehicles traveling on roads and trails. Stout (1992) found that roads and trails created through emergent wetlands were being colonized by barnyard grass (*Echinochloa crusgalli*), which displaces native plants, and is a species on the West Virginia State list of

invasive exotic plants. Designated routes do not cross any emergent wetlands. Instead, they mostly include old logging roads that previously have been planted with exotic cover species following logging operations.

Invasive plants, if allowed to establish and spread, can cause major damage to native plant assemblages and the wildlife they support. We will monitor for invasive species and control or eliminate them annually. Key among these invasive plants species are reed canary grass (*Phalaris arundinacea*), multiflora rose (*Rosa multiflora*), yellow flag iris (*Iris pseudacorus*), and cattails. We will take proper care in cleaning and maintaining all refuge equipment to avoid introduction or transport of invasive plants through refuge- or volunteer-based trail maintenance programs. Based on current trail monitoring results, invasive species presence along trails is low. Therefore it is likely that the current levels of bicycle use and all other public uses permitted on these trails are not causing significant increases in invasive plants relative to the current vegetative community on designated routes.

The refuge minimizes adverse effects on vegetation in a variety of ways. Refuge staff routinely monitors roads and trails for damage and remediates problem areas as needed. Trail maintenance is conducted to help minimize any negative effects associated with trail use. Staff and volunteers also monitor the refuge for the presence of invasive species with the intent of controlling or eliminating them. Because bicycle use is limited to an existing trail bed which is typically packed earth (from past logging road use), direct effects of vegetation impacts will be minimal. There will be minimal impacts to the vegetation growing on the trail itself, typically native and non-native grasses and forbs. Any impacts will occur in the maintained bicycle trail corridor. This corridor does not provide significant habitat for native plant communities on the refuge. If future evidence of unacceptable adverse impacts appears, we will re-route, curtail, or close trails to this use as deemed appropriate. Additionally, the amount of bicycle use (as documented by trail inventories and observation of direct physical impacts) relative to other permitted activities will be considered when making changes to bicycle use on trails.

Effects on Soils: Bicycle wheels can cause physical impacts to soil surfaces. Cessford (1995) notes the shearing action of wheels creates damage to roads and trails, which increases when trail conditions are wet or when traveling up a steep slope. When traveling down slope, skidding with hard braking can result in loosening soil surfaces, which leads to rutting and erosion by channeling water down wheel ruts. If braking is not performed on downhill travel, the impact of tires on the slope will be much less damaging (Cessford 1995).

The Mauch Chunk-derived soil in Canaan Valley is particularly vulnerable to mechanical erosion when vegetation has been removed (Rizzo 2002). This type of erosion may occur when bicycle wheels skid or spin over the soil surface. This can create wheel channels causing rapid water runoff that accelerates erosion down slope (Rizzo 2002).

Trails designated for bicycle use were selected based on soil conditions that were listed as low risk for compaction and erosion as well as an in-field evaluation of existing conditions (Bell 2002, Rizzo 2002). Most of the designated trails are pre-existing roads that have been previously altered by vehicles and logging equipment, therefore soils are generally compacted and less susceptible to additional physical impact and mechanical erosion. Bicycle use on any new trails will follow the existing trail checklist. More specifically, any new bicycle use will occur on previously disturbed areas such as logging roads and rail beds, thereby reducing or eliminating wetland disturbance.

Effects on Wildlife: Disturbances vary with the wildlife species involved and the type, level, frequency, duration and the time of year that human activities occur. The responses of wildlife to human activities include avoidance or departure from the site (Owen 1973, Burger 1981, Kaiser and Fritzell 1984, Korschen et al. 1985, Henson and Grant 1991, Kahl 1991, Klein 1993, Whittaker and Knight 1998), the use of sub-optimal habitat (Erwin 1980, Williams and Forbes 1980), altered behavior or habituation (Burger 1981, Korschen et al. 1985, Morton et al. 1989, Ward and Stehn 1989, Havera et al. 1992, Klein 1993, Whittaker and Knight 1998), attraction (Whittaker and Knight 1998), and an increase in energy expenditure (Morton et al. 1989, Belanger and Bedard 1990). Mammals may become habituated to humans making them easier targets for hunters. Disturbance can cause shifts in habitat use, abandonment of habitat and increased energy demands on affected wildlife (Knight and Cole 1991).

The effects of roads and trails on plants and animals are complex and not limited to the trail width. Trail use can disturb areas outside the immediate trail corridor (Trails and Wildlife Task Force 1998, Miller et al. 2001). Miller et al. (1998) describe a 75-meter zone of influence where bird abundance and nesting activities (including nest success) were found to increase as distance from a recreational trail increased in both grassland and forested habitats. Bird communities in this study were apparently affected by the presence of recreational roads and trails, where common species (e.g., American robins) were found near trails and rare species (e.g., grasshopper sparrows) were found farther from trails. Songbird nest failure was also greater near trails (Miller et al. 1998).

Several studies have examined the effects of recreationists on birds using shallow-water habitats adjacent to trails and roads through wildlife refuges and coastal habitats in the eastern United States (Burger 1981, Burger 1986, Klein 1993, Burger et al. 1995, Klein et al. 1995, Rodgers and Smith 1995, Rodgers and Smith 1997, Burger and Gochfeld 1998). Overall, the existing research clearly demonstrates that disturbances from recreation activities have at least temporary effects on the behavior and movement of birds within a habitat or localized area (Burger 1981, Burger 1986, Klein 1993, Burger et al. 1995, Klein et al. 1995, Rodgers and Smith 1997, Burger and Gochfeld 1998). The findings that were reported in these studies are summarized as follows in terms of visitor activity and avian response to disturbance.

Presence: Birds avoided places where people were present and when visitor activity was high (Burger 1981, Klein et al. 1995, Burger and Gochfeld 1998). Batten (1977) and Burger (1981) found that wading birds were extremely sensitive to disturbance in the northeastern United States. Klein (1993) found that, as the intensity of human disturbance increased, avoidance response by water birds increased. Conflicts arise when migratory birds and humans are present in the same areas (Boyle and Samson 1985). McNeil et al. (1992) found that many waterfowl species avoid disturbance by feeding at night instead of during the day. Studying the effects of human visitation on water birds at the J.N. "Ding" Darling National Wildlife Refuge, Klein (1989) found resident water birds to be less sensitive to disturbance than migrants were; the study also found that sensitivity varied according to species and individuals within species. In general, Klein found that herons and cranes were quite tolerant of people but were disturbed as they took terrestrial prey; great blue herons, tricolored herons, great egrets, and little blue herons were disturbed to the point of flight more than other birds. Kushlan (1978) found that the need of these birds to move frequently while feeding might disrupt inter-specific and intra-specific relationships. Gutzwiller et al. (1994) found that singing behavior of some songbird species was altered by low levels of human intrusion. Some bird species habituate to repeated intrusion; frequently disturbed individuals of some species have been found to vocalize more aggressively, have higher body masses, or tend to remain in place longer (Cairns and McLaren 1980).

Distance: Disturbance increased with decreased distance between visitors and birds (Burger 1986), though exact measurements were not reported.

Reproduction and nesting success: Flight in response to disturbance can lower nesting productivity and cause disease and death (Knight and Cole 1991). Miller et al. (1998) found bird abundance and nesting activities (including nest success) increased as distance from a recreational trail increased in both grassland and forested habitats. Bird communities in this study were apparently affected by the presence of recreational trails, where common species (i.e., American robins) were found near trails and more specialized species (i.e., grasshopper sparrows) were found farther from trails. Nest predation also was found to be greater near trails (Miller et al., 1998). Disturbance may affect the reproductive fitness of males by hampering territory defense, male attraction and other reproductive functions of song (Arrese 1987). Disturbance, which leads to reduced singing activity, makes males rely more heavily on physical deterrents in defending territories, which are time- and energy-consuming (Ewald and Carpenter 1978).

Noise: Noise caused by visitors resulted in increased levels of disturbance (Burger 1986, Klein 1993, Burger and Gochfeld 1998), though noise was not correlated with visitor group size (Burger and Gochfeld 1998).

Knight and Cole (1991) suggest recreational activities occurring simultaneously may have a combined negative impact on wildlife. Hammitt and Cole (1998) conclude that the frequent presence of humans in 'wildland' areas can dramatically change the normal behavior of wildlife mostly through 'unintentional harassment.'

Seasonal sensitivities can compound the effect of disturbance on wildlife. Examples include regularly flushing birds during nesting or causing mammals to flee during winter months, thereby consuming large amounts of stored fat reserves. Hammitt and Cole (1998) note that females with young (such as white-tailed deer) are more likely to flee from a disturbance than those without young. Some uses, such as bird observation, are directly focused on viewing certain wildlife species and can cause more significant impacts during breeding season.

Wildlife associated with aquatic habitats may also be affected by bicycles on trails. Impacts may be indirectly caused by erosion and subsequent sedimentation of streams and vernal pools as a result of poorly designed trails and bicycle travel over bare soils and around drainages. Increased sediment loads can reduce aquatic vegetation and dissolved oxygen concentrations (Sadoway 1986). Sedimentation can directly kill aquatic invertebrates, affecting the success of amphibian larvae and adults (Sadoway 1986). Observations by refuge staff in 2002 document numerous occurrences of amphibian egg masses that failed after becoming coated in sediment from eroding trails and roads nearby. Bartgis and Berdine (1991) report that sedimentation was damaging habitat in Canaan Valley and could cause impacts to rare plants, impair water quality and possibly affect habitat of the southern water shrew *(Sorex palustris punctulatus)*, a State species of concern. This was a direct result of vehicle use and road construction prior to the refuge's acquisition of the property. Trail work conducted since 2002 has begun to address sedimentation and erosion issues on refuge trails. Because trails designated for bicycle use are upland areas or locations of existing (compacted) logging roads, the use of bicycles is not expected to significantly increase erosion or sedimentation problems. Through proper trail maintenance and construction, trail drainage will be improved to minimize the effects of erosion and sedimentation on wildlife.

Short-term localized adverse impacts to fish populations also may result from soil erosion and sedimentation into refuge waterways associated with this activity. Long-term adverse impacts from increased trail miles and trail use might pose another concern to refuge fisheries. Trails that have stream and river crossings will likely degrade over time with increased use and contribute to downstream sedimentation and turbidity, which has been found to be a stressor to brook trout (Sweka and Hartman 2001) and redside dace (Holm and Crossman 1986) populations that are sensitive to habitat degradation.

Two stream crossings have been hardened with rock pilings on stream banks to reduce erosive impacts of bicycle use on those banks. The refuge will monitor stream and river crossings closely and remediate any damaged areas to minimize adverse impacts associated with trail use. Through proper trail construction and maintenance, excessive sedimentation from existing or new trails will be minimized. The addition of bicycle use on existing and new refuge trails will not increase the monitoring requirements to ensure compatibility.

Wildlife disturbance by bicycles has been cited for trail closures on the Handley Wildlife Management Area in West Virginia (Dale 2002). Similar disturbances to resident and migratory wildlife species may also become a problem in the Canaan Valley if bicycle activity increases substantially. The refuge will monitor bicycle use and will curtail this use if it contributes to unacceptable wildlife disturbance. The refuge will also continue to prohibit trails in sensitive areas where wildlife concentrate, such as open water, riparian areas, and open grasslands. This will help reduce the disturbance effect on wildlife.

Anticipated impacts of bicycle use on wildlife include temporary disturbances to species using habitats on the trail or directly adjacent to the trail. Bicycle use typically only occurs from spring through fall and usually when the ground is dry. Additionally, with 23 miles of existing trail open for bicycle use, this activity will be dispersed. Therefore disturbances will be limited in time (season) and space (miles of trail), thus reducing the overall impact. Use of some roads and trails may cause direct impacts such as mortality (e.g., crushing amphibians foraging on grassy roads and trails) to nest abandonment of bird species nesting on trails. Long-term impacts may include certain wildlife species avoiding trail corridors as a result of this use over time. Routes found compatible for bicycle use are located primarily in continuous tracts of northern hardwood forest on the refuge, where forest cover may help reduce disturbance. More sensitive wildlife habitat such as riparian, wetland, and grassland areas are avoided or minimized to the maximum extent possible. The refuge will minimize adverse impacts by using its trail/route checklist to determine whether the existing or new trail meets established criteria.

West Virginia northern flying squirrels have been documented on refuge property near the end of FR 80. This species has recently been removed from the endangered species list. The recovery plan (USFWS 2001) notes that habitat modification may create a competitive advantage for the southern flying squirrel (*Glaucomys volans*), although the extent to which a logging road or trail would create conditions conducive for this are unknown. Roads can adversely affect northern flying squirrel movement by fragmenting habitat, although not all roads create absolute barriers. West Virginia northern flying squirrel are capable of gliding up to 200 ft, with the majority of the glides ranging from 16 to 82 ft (Scheibe et al. 2007, p. 857; Vernes 2001, pp. 1028–1029). West Virginia northern flying squirrel are known to have crossed logging roads, gravel roads, and ski slopes (Ford et al. 2007, p. 8; Menzel et al. 2006a, p. 207; Terry 2004, pp. 18–19). Menzel et al. (2004, p. 358) noted that many northern flying squirrel day dens were located along or near abandoned skidder trails. Some research has found northern flying squirrels occupying den sites near logging roads, skid trails, and on hiking trails (Ford 2002). Routes designated for bicycle use are pre-existing roads and trails, some of which have been in existence for many years. No new habitat clearing is planned in this area; however, some vegetation clearing may be required to maintain the trail corridor. We will periodically evaluate bicycle use to determine any effects it may have on the northern flying squirrel.

The refuge also recognizes that large group sizes may amplify negative effects to wildlife; therefore, groups larger than 10 are required to notify the refuge prior to visiting to determine if a special use permit will be needed. Limiting group size for bicycles is consistent with West Virginia Division of Natural Resources Wildlife Management Area regulations (limit of 10 bicycles with permit) and therefore will aid in consistency between refuge and State managed lands. Requiring large groups to contact the refuge prior to visiting will also enable the refuge to understand which trails are preferred by large groups, and to monitor any potential excessive wildlife disturbance created by large groups. Having the ability to monitor these kinds of disturbances will enable the refuge to mitigate impacts associated with large groups, Examples of mitigation may include directing large groups to less sensitive habitats during breeding seasons or assigning refuge staff to lead or meet with the group while on refuge lands. Limiting group size will also increase the quality of the experience and decrease the potential of conflicting with other users' experience.

We will take all appropriate measures to avoid or minimize any negative effects. We will evaluate the roads and trails periodically to assess whether they meet established suitability criteria and to prevent habitat degradation. If there is evidence of unacceptable adverse impacts on wildlife, we will reroute, curtail, or close trails to this use as deemed appropriate. We will post and enforce refuge regulations, and establish, post, and enforce closed areas as needed. Based on the information provided above, this use is not anticipated to significantly increase wildlife habitat fragmentation or cause significant impacts on wildlife through disturbance.

Effects on Threatened and Endangered Species: There are two Federally listed species known to occur on the refuge, and one species that has recently been de-listed. Cheat Mountain salamanders (*Plethodon nettingi*), listed as threatened, have been documented at a distance from the upper section of Forest Road (FR) 80, and near the cross-country ski trails in that area. Indiana bats (*Myotis sodalis*), listed as endangered, are known to use the refuge's forested areas for summer foraging and may have a summer maternity colony on refuge lands as well. The West Virginia northern flying squirrel (*Glaucomys sabrinus fuscus*) has been documented on refuge property near the end of FR 80. This species has recently been removed from the endangered species list. The refuge requested Section 7 informal consultation with the Service's West Virginia Field Office under the Endangered Species Act (16 U.S.C. 1536) on all the actions in this CCP, including bicycling, that could potentially impact listed species. This process resulted in a finding that the proposed actions are not likely to adversely affect the listed species or their associated habitats on the refuge. The full Intra-Service Section 7 Biological Evaluation form can be found in appendix H of this CCP.

Cheat Mountain salamander – This species is sensitive to any habitat changes that remove a forest canopy or reduce soil moisture and relative humidity. Habitat used by the Cheat Mountain salamander can be impacted through modifications and alterations to the forest canopy which can include road development, ski slope development, timber harvesting, or any other activity which significantly increases the amount of sunlight reaching the forest floor. Because Cheat Mountain salamanders have very specific ranges of tolerance for temperature and relative humidity, any activity which increases soil temperature and lowers relative humidity

near the ground surface can have detrimental effects on salamander populations (USFWS 1991). According to the Service (USFWS 1991), trails that receive heavy use resulting in bare trail treads could limit movements of Cheat Mountain salamanders and interfere with reproduction.

Since refuge acquisition of the Kelly-Elkins and Graham tracts, surveys for Cheat Mountain salamanders have documented their presence on the uphill and downhill sides of Powderline and Three-Mile ski trails. These, as well as all cross-country ski trails on the Kelly-Elkins Tract are closed to public use outside the ski season. To protect this sensitive species, bicycling is prohibited on the ski trails and is restricted to FR 80, an established forest road.

Indiana Bat – Indiana bats were documented on the refuge for the first time through acoustical monitoring conducted by the U.S. Forest Service in 2003 (Ford 2003). Indiana bats were found foraging at two locations in the south end of the refuge. Refuge staff began conducting acoustical surveys in 2005. These surveys have documented three likely Indiana bat observations in the same location as the 2003 survey during 2005, 2007, and 2008. Additionally, acoustical surveys documented one new location for the species during 2007. Indiana bat calls have been documented from the refuge in the months of May, July, August, and September. However, since bicycling has been occurring for many years, is restricted to day time hours, and must comply with the stipulations of this document, any potential negative effects are expected to be insignificant. We will periodically evaluate this activity to determine any effects it may have. If evidence of any adverse effects appears, the location(s) of bicycle use will be curtailed or discontinued as needed.

As determined in the Section 7 informal consultation (appendix H), bicycle use is not likely to adversely affect threatened or endangered species on the refuge. The use will occur primarily on existing roads and trails, none of which intersect occupied, threatened or endangered species habitat. The nearest known Cheat Mountain salamander habitat to FR 80 is 754 feet from the road (USFWS 2008), far more than the 300-foot buffer zone recommended in the recovery plan for this species (USFWS 1991). Additional trail openings or new trails will be evaluated for suitability using established criteria (trail check list) before being opened to bicycling. Sensitive habitats such as those occupied by threatened or endangered species will be avoided.

Any effects of bicycling on designated roads and trails are not considered, separately or cumulatively, to constitute significant short-term or long-term impacts. Assessment of potential future impacts was based on available information and current and anticipated level and pattern of use collected from a variety of annual wildlife and plant surveys conducted by refuge staff as well as informal field observations. The current use is viewed as an effective and justifiable method of travel that allows the public to discover, experience, and enjoy priority public uses on the refuge. Continued monitoring of the effects of bicycling and associated human activities is necessary to better understand the influence of the use on refuge habitats, plant and wildlife communities, and visitors. Monitoring identifies any actions needed to respond to new information (adaptive management) and correct problems that may arise in the future.

PUBLIC REVIEW AND COMMENT

This compatibility determination was released concurrent with the draft Comprehensive Conservation Plan/ Environmental Assessment for a 45-day public review and comment period.

DETERMINATION (CHECK ONE BELOW):

_____ Use is not compatible

__**X**__ Use is compatible with the following stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

The refuge has developed a list of criteria for determining whether any given route would be appropriate for public uses, including bicycle use. These criteria apply to current and future trails. Criteria are as follows:

Checklist for Existing Routes to Be Eligible for Compatibility Consideration
(Routes must meet all criteria)

1. Route provides an opportunity to view a variety of habitats and wildlife.

2. Route is safe for the access proposed at current use levels.

3. Route requires minimal annual maintenance (i.e, waterbars, stepping stones, etc.) to ensure safe access and to prevent further habitat degradation.

4. Route has a low potential for fragmenting habitat or disturbing wildlife populations.

5. Based on existing soils information, less than 50 percent of the route's length occupies soil types rated as high or very high for compaction and/or erosiveness. The route is not rated as severely limited for hiking trails based on the Tucker County Soil Survey.

6. Any route crossing of sensitive soils occupies the shortest possible distance. Organic soil crossings are minimized or eliminated.

7. Continued use of the existing route is not likely to cause further wetland alteration or degradation. There is low risk that hydrology, soil stability, sensitive plant communities, riparian zones, and wildlife habitats would be adversely affected.

8. Route predominately occupies modified substrate (graveled, compacted, or filled) like logging roads and rail grades.

9. Route is not incised greater than 1 foot deep over 10 percent of its total length.

Additional Stipulations for Bicycle Use:

— Refuge regulations will be posted and enforced. Closed areas will be established as needed, posted, and enforced. Signs necessary for visitor information, safety, and traffic control will be kept up to date.

— The known presence of a threatened or endangered species will preclude the use of an area until the refuge manager determines otherwise.

— Bicycling is only compatible on designated roads and trails.

— Bicycling is restricted to refuge open hours: 1 hour before sunrise until 1 hour after sunset.

— Group size is encouraged to be no more than 10 persons to promote public safety, accommodate other users, and reduce wildlife disturbance. Groups larger than 10 persons must contact the refuge office prior to visiting the trail system to determine if a special use permit is needed. Visitors traveling only on roads shared with vehicles are not required to contact the refuge office or obtain a special use permit.

— All routes designated for public access are annually inspected for maintenance needs. Prompt action is taken to correct any conditions that risk public safety. Roads and trails are maintained at a level that reasonably accounts for safe travel. Roads and trails are not cleared in winter.

— Routes designated for public access are monitored periodically to determine if they continue to meet the compatibility criteria established by the refuge. Should monitoring and evaluation of the use indicate that the compatibility criteria are or will be exceeded, appropriate action will be taken to ensure continued compatibility, including modifying or discontinuing the use.

— Routine law enforcement patrols are conducted throughout the year. The patrols promote education and compliance with refuge regulations, monitor public use patterns and public safety, and document visitor interaction.

— Potential conflicts with other public uses such as hunting, interpretation, etc. will be minimized by using trailhead signs and other media to inform the visitors about current public use activities as well as which activities are authorized in specific locations throughout the refuge.

JUSTIFICATION

Bicycling has occurred on the refuge since its establishment. The use of bicycles at Canaan Valley refuge to facilitate priority public uses enhances visitors' ability to view the wide diversity of refuge habitats and can make access easier as many trails exceed four miles round trip. Trails at Canaan Valley refuge are longer than trails at many other refuges. By providing opportunities for bicycling, the refuge opens itself to a whole new group of users that might not otherwise benefit from the outreach and educational opportunities available at the refuge.

Refuge staff has implemented several restrictions to minimize the anticipated impacts of bicycling on fish, wildlife, and habitats. Bicycling is only authorized on designated roads and trails. Routes designated for bicycle use are existing logging and skid roads, and most have hardened surfaces or already compacted soils which directly limit the physical impact of this activity to soils, hydrology, and vegetation. In addition, these routes are located predominately on upland soils to prevent impacts to fragile wetland soils. Trail conditions have improved since refuge acquisition of the Main Tract in 2002 due to restoration and maintenance actions.

Additionally, vehicles were prohibited from accessing these areas after the refuge acquired the property which greatly reduced impacts. The use of bicycles on existing designated public use trails will not significantly increase resource impacts over and above the other, existing public uses. Because of the restrictions and management of the trail system, the impact to soils and possible sedimentation of wetland resources will be minimized. Therefore these anticipated impacts will not affect the refuge's ability to fulfill the purposes of wetland conservation established through the Emergency Wetland Resources Act (1986). Because tread width is narrow and trails are on established logging roads, impacts to plants and potential invasive species colonization will be minor and therefore not affect the refuge's ability to conserve plant resources as described in the mission of the Refuge System and to protect the ecological integrity of Canaan Valley and its resources, a founding purpose for designation of the refuge in the 1979 EIS.

Bicycling routes occur primarily in forested habitats to help reduce disturbance to wildlife. Disturbance along bicycling corridors will impact only a fraction of the habitat available for wildlife on the refuge, and this disturbance will occur within the most abundant habitat type on the refuge. By limiting use to designated trails on a small percentage of the refuge and within the most common habitat type, disturbance will be limited and manageable.

For this reason disturbance effects will not prevent the refuge from fulfilling the purposes of the Fish and Wildlife Act (1956) or the mission of the Refuge System for conserving, managing, restoring, and protecting wildlife resources. This use will not affect the ability to fulfill its purpose under the Migratory Bird Conservation Act to serve as a sanctuary or management area for migratory birds as this use will not occur on the tracts that were acquired under that act.

We will post and enforce refuge regulations, and establish, post, and enforce closed areas as needed. We also evaluate the roads and trails periodically to assess whether they meet established suitability criteria and to prevent degradation. If evidence of unacceptable adverse impacts appears, we will repair the trail through scheduled maintenance programs, or re-route, curtail, or close trails to bicycling as deemed appropriate.

Conflicts between bicycle riders and other users are localized and limited in time and space. Many refuge trails are closed to bicycle access to prevent user conflicts and to reduce the overall impact on the priority public uses. Given the size of the refuge and miles of trail open for the various forms of public access, conflicts are expected to be minor.

Because of the criteria established for permitting this activity, bicycling is considered to be an acceptable and manageable method for facilitating priority public uses at Canaan Valley refuge. Bicycling will provide access to more remote areas of the refuge where wetland plant communities and other habitats may be viewed and interpreted. For the reasons discussed above, this access will not affect the refuge's ability to conserve wetlands or protect, manage, and restore the wildlife and plant resources, as mandated through two of the refuge's establishing purposes, namely the Emergency Wetlands Resources Act (1986) and the Fish and Wildlife Act (1956), or the mission of the Refuge System. Since public use trails do not occur on lands acquired under the Migratory Bird Conservation Act, bicycling will not affect the refuge's ability to protect and manage migratory birds on those tracts. We therefore conclude bicycling will not materially interfere with or detract from the mission of the Refuge System or the purposes for which the refuge was established.

SIGNATURE:

Refuge Manager: Kenneth L. Stern /Acting (Signature) 2/14/2011 (Date)

CONCURRENCE:

Regional Chief: Anthony D Léger (Signature) 02/25/2011 (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: 02/25/2021

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COMPATIBILITY DETERMINATION

USE

Cross-Country Skiing and Snowshoeing to Facilitate Priority Public Uses

REFUGE NAME

Canaan Valley National Wildlife Refuge

DATE ESTABLISHED

August 11, 1994

ESTABLISHING AND ACQUISITION AUTHORITY(IES)

The establishment of Canaan Valley National Wildlife Refuge (refuge) was first approved in an Environmental Impact Statement (EIS) released on May 30, 1979. However, the U.S. Fish and Wildlife Service (Service) decided to await the outcome of litigation surrounding a proposed storage hydroelectric facility before pursuing any further action. The approval of the refuge was affirmed by the Service in a 1994 Final Environmental Assessment and Finding of No Significant Impact on July 11, 1994, which confirmed the adequacy of the previously approved 1979 EIS. The refuge was officially established when the first tract of land was acquired on August 11, 1994. The Service has acquired lands for the Canaan Valley National Wildlife Refuge (refuge) under the following authorities:

1) Fish and Wildlife Act of 1956 [16 U.S.C. 742f (a)(4)]

1) Emergency Wetlands Resources Act of 1986 [16 U.S.C. 3901b]

2) Migratory Bird Conservation Act of 1929 [16 U.S.C. 715d]

REFUGE PURPOSE(S)

The refuge was established to ensure the ecological integrity of Canaan Valley and the continued availability of its wetland, botanical, and wildlife resources to the citizens of West Virginia and the United States (USFWS 1979, 1994). Additional refuge purposes as derived from the legislative authorities are as follows:

(1) "... for the development, advancement, management, conservation, and protection of fish and wildlife resources..." (Fish and Wildlife Act of 1956; 16 U.S.C. 742f(a)(4));

(2) "... for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions." (Emergency Wetlands Resources Act of 1986;16 U.S.C. 3901(b)); and,

(3) "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (Migratory Bird Conservation of Act; 16 U.S.C. 715d).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

The mission of the National Wildlife Refuge System (Refuge System) is "to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." 16 U.S.C. 668dd(a)(2) (National Wildlife Refuge System Improvement Act of 1997).

DESCRIPTION OF USE

(a) What is the use? Is it a priority public use?
The uses are cross-country skiing and snowshoeing. While these uses are not priority public uses, they facilitate visitor participation in priority public uses (e.g., wildlife observation and photography).

An additional 10 miles of trails on the refuge are managed for commercial cross-country skiing and snowshoeing. There is a separate compatibility determination for commercial cross-country skiing and snowshoeing on the refuge.

(b) Where will these uses be conducted?
Cross-country skiing and snowshoeing will be allowed on the nearly 32 miles of existing public roads and trails on the refuge. These uses will also be allowed on the 10 miles of commercially operated and maintained trails on the Kelly-Elkins tract, as accessed by Forest Road 80. Finally, these uses may also be allowed on any additional trails constructed or opened to the public through this Comprehensive Conservation Plan (CCP) or other appropriate regulatory process. See map B-2 for locations of public cross-country ski and snowshoeing trails.

(c) When will the uses be conducted?
These uses occur in the winter when there is sufficient snow to allow the activities and when the refuge is open to the public. Most cross-country skiing and snowshoeing occur mid-November through mid-March. Currently the refuge is open daily from one hour before sunrise until one hour after sunset.

(d) How will the uses be conducted?
Visitors on cross-country skis and snowshoes depart from refuge roads or parking areas and are authorized to use designated roads and trails. Refuge staff does not plow roads or groom trails in the winter, so access may be limited.

Information kiosks identify the roads and trails open for travel and explain permitted public uses. Refuge trails and roads currently open to skiing and snowshoeing are described in the trail brochure. As additional trail connections are made, refuge brochures and kiosks will be updated to show all designated trails. Parking lots and kiosks have been constructed at the trailheads of refuge trails to help orient visitors.

(e) Why are these uses being proposed?
While skiing and snowshoeing are not priority public uses, they provide opportunities for visitors to observe and learn about the Refuge System, Canaan Valley refuge, and wildlife and habitats firsthand. Often visitors skiing and snowshoeing on the refuge engage in priority public uses such as wildlife observation and photography. Although much of the bird life is gone for the season and many mammal species are dormant or active only at night, this activity does help provide opportunities for wildlife observation. Winter species such as chickadees, nuthatches and ravens are commonly observed. Mammal tracks are used to interpret the area's wildlife populations during the winter months. This exposure may lead to a better understanding of and interest in natural ecosystems, the importance of national wildlife refuges, and the role of the Service in protecting and restoring natural resources.

AVAILABILITY OF RESOURCES

The resources necessary to provide and administer road and trail use, at the current use level, are available within current and anticipated refuge budgets. Staff time associated with administration of this use is related to assessing the need for road and trail maintenance and repair, maintaining kiosks, gates, maintaining traffic counters and recording collected data, sign-posting roads and trails, informing the public about new refuge uses, conducting visitor use surveys, analyzing visitor use patterns, monitoring the effects of public uses on refuge resources and visitors, and providing information to the public about the use. These activities will be conducted in conjunction with the activities outlined in the "Wildlife Observation and Photography," and "Environmental Education and Interpretation" compatibility determinations; therefore managing for cross-country skiing and snowshoeing will not require additional staffing or resources.

ANTICIPATED IMPACTS OF THE USE

In general, negative effects on habitat and wildlife associated with these activities are considered minimal. Most wildlife species are less active during winter months, sensitive migratory birds have largely left the refuge, and it is not breeding season for any of the wildlife that may be present. The refuge does not groom or maintain trails in the winter. Cross-country skiing and snowshoeing are limited to winter and require sufficient snow cover to allow access. Surface water and soil may be frozen for at least a portion of this time, most vegetation is dormant, and sensitive habitat will largely be protected by a surface layer of snow. In addition, skis and snowshoes are designed to distribute weight, decreasing potential for eroding soils near waterways. Skiing and snowshoeing are limited to established roads and trails, and no recreational snowmobiles are allowed. Following are more specific descriptions of potential impacts associated with cross-country skiing and snowshoeing.

Effects on Hydrology and Water Quality: Visitor use has the potential to contaminate the Blackwater River and its tributaries through soil sedimentation into streams caused by skiing and snowshoeing. There may also be runoff of petroleum products from parking lots.

There may be additional impacts to water resources where new trails cross the refuge's rivers, streams, and tributaries increasing the potential short-term and long-term downstream erosion and sedimentation. Additional visitor use also increases the potential for contaminating rivers, streams, and open water through the runoff of petroleum products from parking lots. However, many refuge roads and parking lots are not plowed in the winter time, thus reducing impacts from parked cars.

The refuge minimizes adverse effects on water resources in a variety of ways. Refuge staff routinely monitors roads and trails for damage and remediates problem areas as needed. The refuge also conducts public outreach efforts to notify visitors of proper precautions, including carrying out all trash. This helps minimize risks associated with visitor use on the refuge. Visitors are also encouraged to limit group size to less than 10 people, and groups of more than 10 are required to check in at the refuge office. Because of these efforts, combined with the seasonal limitations, trail restrictions, and stipulations listed in this document, impacts to water resources are expected to be minimal.

Effects on Vegetation: Short-term effects consist of the deterioration of plant material, whereas long-term effects of trampling include direct and indirect effects on vegetation and soils like diminishing soil porosity, aeration, and nutrient availability through soil compaction (Kuss 1986, Roovers et al. 2004). Compaction of soils thus limits the ability of plants, particularly rare and sensitive species, to revegetate affected areas (Hammitt and Cole 1998). Kuss (1986) found, plant species adapted to wet or moist habitats are the most sensitive and increased moisture content reduces the ability of the soil to support recreational traffic.

Overall effects on vegetation are expected to be minimal. As mentioned previously, skiing and snowshoeing are limited to winter and require sufficient snow cover to allow access. Vegetation is largely dormant during the winter and will largely be protected by a surface layer of snow. In addition, skis and snowshoes are designed to distribute weight, decreasing potential for compacting or eroding soils and trampling vegetation. Skiing

and snowshoeing are limited to designated roads and trails, and no recreational snowmobiling is allowed. Designated roads and trails do not have any known occurrences of rare plant species on their surface that would be impacted by these uses. Some rare plants have been documented in habitat adjacent to trails. Users leaving designated trails could adversely affect adjacent vegetation; however, because of the time of year and low numbers of visitors expected to leave the trails, negative effects are expected to be minimal.

Effects on Soils: Soils can be compacted and eroded as a result of continued use of roads and trails. The Mauch Chunk-derived soil in Canaan Valley is particularly vulnerable to mechanical erosion when the vegetation has been removed (Rizzo 2002). If compacted, Mauch Chunk soils can facilitate rapid water runoff that accelerates erosion down slope (Rizzo 2002).

Overall effects on soils are expected to be minimal. Skiing and snowshoeing are limited to winter and require sufficient snow cover to allow access. The soil surface will likely be frozen for some of the season, making it much less vulnerable to compaction or erosion. When these activities are occurring, soils also will largely be protected by a surface layer of snow. In addition, skis and snow shoes are designed to distribute weight, decreasing potential for compacting or eroding soils. Over the long-term, the risk of erosion and sedimentation problems that might affect soils in these habitats would increase with increased visitor use and trail use. However, given the time of year, locations, and methods used, increased levels of skiing and snowshoeing are not expected to significantly affect soils on the refuge.

Effects on Wildlife: Short-term and long-term adverse impacts are expected for wildlife populations in relation to increasing trail miles and visitor use. Disturbances will vary by wildlife species involved and the type, level, frequency, duration and the time of year activities occur. Beale and Monaghan (2004) found that adverse effects to wildlife increase as number of users increase. The study found that an animal's response to one visitor walking down a trail is entirely different than its response to a group of users walking down a trail.

Long-term adverse impacts from increased trail miles and trail use might pose a concern to refuge fisheries. Trails that have stream and river crossings would likely degrade over time with increased use and contribute to downstream sedimentation and turbidity, which has been found to be a stressor to brook trout (Sweka and Hartman 2001) and redside dace (Holm and Crossman 1986) populations that are sensitive to habitat degradation. However, most stream and river crossings occur on bridges, which helps to minimize impacts to habitats. The refuge will monitor stream and river crossings closely and remediate any damaged areas to minimize adverse impacts associated with trail use. During winter months when the ground is frozen, erosive potential of soils are reduced and impacts of cross-country skiing snowshoeing on erosion and sedimentation of aquatic habitats will be minimal.

The use of trails in the winter for cross-country skiing and snowshoeing have similar wildlife disturbance effects as those which occur through pedestrian travel on these trails during the other seasons. One of the primary differences is that many migratory birds are not present and most resident species are not breeding or raising young during the time of year when cross-country skiing and snowshoeing occur. Additionally, many mammal species are less active during winter months. The most commonly observed wildlife in the winter is chickadees, nuthatches and ravens. Winter conditions cause increased stress through extreme weather conditions and food availability (Hammit and Cole 1998). Both bird and mammal species which are present and active this time of year can be even more negatively affected from the same level of disturbance because of the added environmental stressors of severe weather and food shortages.

We will take all necessary measures to mitigate any negative effects on wildlife associated with skiing and snowshoeing. We will evaluate roads, trails, and activities periodically to assess potential negative effects. If evidence of unacceptable adverse effects is observed, we will curtail or discontinue activities as needed. We will post and enforce refuge regulations, and establish, post, and enforce closed areas as needed. However, negative effects on wildlife are expected to be minimal. As discussed previously, cross-country skiing and snowshoeing are limited to winter months and require sufficient snow levels to allow access. Additionally, many refuge trails become difficult to access during winter conditions as access to main trail heads (A-frame Road and Old Timberline Road) are not maintained. This greatly reduces the numbers of users accessing refuge trails for these uses and thereby minimizes impacts. Requirements for skiers to remain on designated trails also reduce the impact of recreational activities on wildlife (Miller et al 2001).

West Virginia northern flying squirrels have been documented on refuge property near the end of Forest Road (FR) 80. This species has recently been removed from the endangered species list. The recovery plan (USFWS 2001) notes that habitat modification may create a competitive advantage for the southern flying squirrel *(Glaucomys volans)*, although the extent to which a logging road or trail would create conditions conducive for this are unknown. Some research has found northern flying squirrels occupying den sites near logging roads, skid trails, and hiking trails (Ford 2002). Routes designated for these uses are pre-existing roads and trails, some of which have been in existence for many years. No new habitat clearing is planned in this area; however, some vegetation clearing may be required within the trail corridor. As mentioned previously, we will periodically evaluate these activities to determine any effects they may have. If evidence of unacceptable adverse effects appears, the location(s) of activities will be curtailed or discontinued as needed.

The refuge also recognizes that large group sizes may amplify negative effects to wildlife. Therefore, groups larger than 10 are required to notify the refuge prior to visiting to determine if a special use permit will be needed. Requiring large groups to contact the refuge prior to visiting will enable the refuge to understand which trails are preferred by large groups, and to monitor any potential excessive wildlife disturbance created by large groups. Having the ability to monitor these kinds of disturbances will enable the refuge to mitigate impacts associated with large groups, Examples of mitigation may include directing large groups to less sensitive habitats during breeding seasons or assigning refuge staff to lead or meet with the group while on refuge lands. Limiting group size will also increase the quality of the experience and decrease the potential of conflicting with other users' experience.

Effects on Threatened and Endangered Species: There are two Federally listed species known to occur on the refuge, and one species that has recently been de-listed. Cheat Mountain salamanders (*Plethodon nettingi*), listed as threatened, have been documented at a distance from the upper section of FR 80, and near the commercially operated and maintained cross-country ski and snowshoe trails in that area. Indiana bats (*Myotis sodalis*), listed as endangered, is known to use the refuge's forested areas for summer foraging and roosting. It is possible that they have a summer maternity colony on refuge lands as well, but this has not been documented. The refuge requested Section 7 informal consultation with the Service's West Virginia Field Office under the Endangered Species Act (16 U.S.C. 1536) on all the actions in this CCP, including cross-country skiing and snowshoeing, that could potentially impact listed species. This process resulted in a finding that the actions are not likely to adversely affect the listed species or their associated habitats on the refuge. The full Intra-Service Section 7 Biological Evaluation form can be found in appendix Hof this CCP.

Cheat Mountain salamander— The public can access the commercially operated and maintained cross-country ski and snowshoe trails, such as Powderline and Three-Mile Trails, via Forest Road 80. However, these trails are only open during the winter months when there is snow on the ground. During this time of year, salamanders are not active and are underground (USFWS 2009). Furthermore, because these trails are not open to the public outside of the winter time, the trails and the substrate on the trails remain undisturbed during the time of year when the salamanders are active. Therefore these public uses are not likely to adversely affect Cheat Mountain salamanders.

These old roads, now public use ski trails, have an altered micro-habitat and are not habitat for Cheat Mountain salamanders; therefore, we do not expect this species to be living in these trails. Therefore, the potential for Cheat Mountain salamanders to be present on the trails is limited to salamanders occasionally crossing the trail.

Salamanders may cross the trail in low numbers until temperatures drop and the salamanders are no longer active and present on the surface. Their presence on the surface is temperature and moisture dependent, thus dates of emergence and submergence depend on these environmental factors and can vary from year to year (Pauley 1978a; 1978b; Pauley 2005 in Pauley 2008). It is estimated that when temperatures are below 55F salamanders are not likely to be active on the surface (USFWS 1991). Based on climate information from 1948 to 2000, average temperatures in Canaan Valley do not exceed 55F until May 14 and fall below 55F after September 26 (Brooks pers. comm.). Under the current conditions of the special use permit issued to the commercial operator who operates and maintains these trails, maintenance operations can only occur between October 10 and April 30. This is well beyond when salamanders are likely to be present on the surface. Therefore the chance of direct take is extremely unlikely (discountable).

The chance of direct take from maintenance activities is further limited due to the expected low amount of active maintenance conducted on these trail sections. Maintenance typically occurs on one to two days a year on these higher elevations trails and consists of hand crews with one all-terrain vehicle (ATV) and trailer to haul equipment. ATV use is limited to usually two passes up and down the trail to move tools (Chase, pers.comm). Maintenance activities typically include the removal of downed trees and limbs which have fallen across the trail during the previous season and maintaining existing waterbars to prevent erosion. Maintenance activities occur within a 4-foot-wide corridor of the trail – two feet in either direction of the center line – as stipulated in the special use permit issued to the commercial operator. Any other activities related to trail maintenance occur within the footprint of the trail. The risk of the maintenance crew encountering a salamander is extremely unlikely to occur (discountable).

Trails have been noted impediments to Cheat Mountain salamander movements, possibly fragmenting and genetically isolating populations as well as making these populations more vulnerable to stochastic events. Pauley (unpublished data in USFWS 1991) found that roads, and potentially some trails, serve as barriers that prevent territories of different individuals from overlapping, thus fragmenting populations and gene pools. Heavily traveled trails can result in removal of leaves and other forest litter, leaving bare trail treads (USFWS 1991; West Virginia Department of NaturalResources 2000, 1999). Preliminary data suggest that the salamanders rarely cross trails and other openings that lack sufficient leaf litter cover (Pauley 2005 in Pauley and Waldron 2008). Cheat Mountain salamanders use forest floor litter as foraging cover and refugia, especially during the day. Therefore, the extent to which trails and roads serve as a barrier to the salamander most likely depends on the site-specific characteristics such as width, canopy cover, substrate material, compaction, and level/type of use.

Conditions related to blocking movements for salamanders appear to be related to increased temperature and humidity resulting from an open tree canopy as well as the removal of vegetation and leaf litter through public use activities creating bare soil conditions. The cross-country ski trails maintained by the commercial operator are not used outside the ski season for public use and are not heavily traveled. Therefore excessive trampling resulting in the removal of litter and vegetation to create bare dirt surfaces does not occur on these trails. Because habitat on the trail is predominately grass and fern cover with limited rock and woody debris, it likely permits salamanders to move across the trail. In addition, both Powderline and Three-Mile trails are narrow and have partial canopy cover providing shading and cooling effects to the trail surface. This creates more suitable conditions for salamanders to move across the trail. The lack of bare soil conditions coupled with the presence of canopy cover suggest that these trails do not create a barrier to salamander movement.

We do not expect the presence of these trails to fragment these populations or create genetic barriers. For this reason the trails are not likely to cause indirect adverse effects to Cheat Mountain salamanders.

The refuge will create a vegetated buffer of native tree species along these trails. Planting native tree species such as red spruce along the trails will eventually provide a more closed canopy over the trail and improve substrate and vegetation on the trail itself. Native tree species will eventually shade out all of the grass and fern cover which currently dominates the trails, and will improve microhabitat conditions for salamanders by increasing leaf litter, woody debris, and soil moisture (USFWS 1991). These trail improvements will provide a more conducive corridor for Cheat Mountain salamanders to move between upslope and downslope populations. Revegetation of refuge cross-country ski trails and increasing canopy cover is an additional conservation measure the refuge can accomplish to further enhance habitat conditions for the salamander.

In the future, the refuge will also consider other options such as replacing trail segments with boardwalks to further facilitate salamander movement across trails. This action is one of the recommended management guidelines in the recovery plan for this species (USFWS 1991). In 2009, the Monongahela National Forest initiated a study to design more effective road and trail maintenance activities to benefit Cheat Mountain salamander populations (Pauley and Waldron 2008). If those results apply to habitats on the Canaan Valley refuge, the refuge will consider implementation of similar measures.

Indiana Bat—Indiana bats were documented on the refuge for the first time through acoustical monitoring conducted by the U.S. Forest Service in 2003 (Ford 2003). Indiana bats were found foraging at two locations

in the south end of the refuge. The refuge began conducting acoustical surveys in 2005. These surveys have documented three likely Indiana bat observations in the same location as the 2003 survey during 2005, 2007, and 2008. Additionally, acoustical surveys documented one new location for the species during 2007. Indiana bat calls have been documented from the refuge in the months of May, July, August, and September. Maternity colonies may also be present on the refuge. As stated in the Section 7 informal consultation (appendix H), cross-country skiing and snowshoeing are not likely to adversely affect this species as these activities will not be disrupting hibernacula during the winter months or disrupting foraging activities during the remainder of the year.

Conclusion
At current and projected levels of use, potential negative effects from cross-country skiing and snowshoeing are not considered significant. The effects will be temporary in duration and are not expected to cause serious changes in animal behavior. As with other activities, we will continue to implement management actions which minimize potential negative effects on hydrology and water quality, soils, vegetation, and wildlife. Trails will be monitored for potential negative effects. If evidence of unacceptable adverse effects is observed, we will curtail or discontinue these activities as needed to protect wildlife and habitat. We will post and enforce refuge regulations, and establish, post, and enforce closed areas as needed.

PUBLIC REVIEW AND COMMENT

This compatibility determination was released concurrent with the draft Comprehensive Conservation Plan/ Environmental Assessment for a 45-day public review and comment period.

DETERMINATION (CHECK ONE BELOW):

_____ Use is not compatible

__**X**__ Use is compatible with the following stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

The refuge has developed a list of criteria for determining whether any given route would be appropriate for public uses, including cross-country skiing and snowshoeing. These criteria apply to current and future trails. Criteria are as follows:

Checklist for Existing Routes to Be Eligible for Compatibility Consideration
(Routes must meet all criteria)

1. Route provides an opportunity to view a variety of habitats and wildlife.

2. Route is safe for the access proposed at current use levels.

3. Route requires minimal annual maintenance (i.e, waterbars, stepping stones, etc.) to ensure safe access and to prevent further habitat degradation.

4. Route has a low potential for fragmenting habitat or disturbing wildlife populations.

5. Based on existing soils information, less than 50 percent of the route's length occupies soil types rated as high or very high for compaction and/or erosiveness. The route is not rated as severely limited for hiking trails based on the Tucker County Soil Survey.

6. Any route crossing of sensitive soils occupies the shortest possible distance. Organic soil crossings are minimized or eliminated.

7. Continued use of the existing route is not likely to cause further wetland alteration or degradation. There is low risk that hydrology, soil stability, sensitive plant communities, riparian zones, and wildlife habitats would be adversely affected.

8. Route predominately occupies modified substrate (graveled, compacted, or filled) like logging roads and rail grades.

9. Route is not incised greater than 1 foot deep over 10 percent of its total length.

Additional Stipulations to Ensure Compatibility:

—Refuge regulations will be posted and enforced. Closed areas will be established as needed, posted, and enforced. Signs necessary for visitor information, safety, and traffic control will be kept up to date. Trails have been blazed on refuge lands to allow cross-country skiers to follow designated routes when trails are snow covered.

—The known presence of a threatened or endangered species will preclude the use of an area until the refuge manager determines otherwise.

— Snowshoeing and cross-country skiing are only compatible on designated roads and trails shown.

—Snowshoeing and cross-country skiing are restricted to refuge open hours: 1 hour before sunrise until 1 hour after sunset.

—The refuge conducts an outreach program to promote public awareness and compliance with public use regulations on the refuge.

—All routes designated for public access are annually inspected for maintenance needs. Prompt action is taken to correct any conditions that risk public safety. Roads and trails are maintained at a level that reasonably accounts for safe travel. Roads are not plowed in winter and non-commercial trails are not groomed.

—Routes designated for public access are monitored periodically to determine if they continue to meet the compatibility criteria established by the refuge. Should monitoring and evaluation of the use(s) indicate that the compatibility criteria are or will be exceeded, appropriate action will be taken to ensure continued compatibility, including modifying or discontinuing the use.

—Routine law enforcement patrols are conducted throughout the year. The patrols promote education and compliance with refuge regulations, monitor public use patterns and public safety, and document visitor interaction.

—Guidelines to ensure the safety of all participants will be issued in writing to any special use permit holder for the activities and will be reviewed before the activity begins.

—Potential conflicts with other public uses such as hunting, interpretation, etc. will be minimized by using trailhead signs and other media to inform the visitors about current public use activities as well as which activities are authorized in specific locations throughout the refuge.

JUSTIFICATION

One of the secondary goals of the Refuge System is to provide opportunities for the public to develop an understanding of wildlife wherever those opportunities are compatible. Cross country skiing and snowshoeing facilitate opportunities for viewing wildlife and habitats with relatively low levels of disturbance. Visitors participating in this activity will be directly engaged in wildlife observation, education, and photography which are identified in the National Wildlife Refuge Improvement Act of 1997 as priority public uses of the Refuge System.

Additionally, during much of the winter months when there is deep snow cover in the valley, cross-country skiing and snowshoeing are often the only methods available for facilitating priority public uses. It is likely that visitors participating in these activities will learn more about wildlife and habitats, the refuge, and the Refuge System, and will therefore support the mission of the Refuge System and the purposes of the refuge.

Cross country skiing and snowshoeing are restricted to designated roads and trails. These activities are limited to winter months and require sufficient snow levels to allow access. The soil surface will be frozen and covered in snow for most of the season, making it much less vulnerable to compaction or erosion. Vegetation is largely dormant during the winter and will be protected by a surface layer of snow. In addition, skis and snowshoes are designed to distribute weight, decreasing the potential for harming vegetation and compacting or eroding soils.

Because of the established trail criteria and additional stipulations listed above, cross-country skiing and snowshoeing are considered to be acceptable and manageable methods for facilitating priority public uses at Canaan Valley refuge. These uses will provide access to more remote areas of the refuge where wetland plant communities and other habitats may be viewed and interpreted. Trails open to this use are predominately on upland soils so wetlands are not affected. Because of the restrictions and management of the trail system, the impact to soils and possible sedimentation of wetland resources will be minimized. Because of trail habitat conditions and limited public use and maintenance on trails through Cheat Mountain salamander habitat there will not likely be adverse effects to the species.

Furthermore, the CCP says that the refuge will improve habitat conditions for the Cheat Mountain salamander through trail revegetation and narrowing on the Kelly-Elkins tract as well as other physical means for improving habitat connectivity. Therefore any anticipated impacts will not affect the refuge's ability to fulfill the purposes of wetland conservation established through the Emergency Wetland Resources Act (1986).

Most of the use is concentrated at on the Kelly-Elkins and Graham tracts which represent a small portion of the available wildlife habitat which remains unaffected by this use. Other public use trails are open to this use, however, road access to trail heads is not maintained and the trails themselves are not groomed on other refuge tracts. This greatly affects the numbers of users on other areas of the refuge and minimizes disturbance to wildlife and other potential impacts to a smaller area of refuge land. Because cross-country skiing and snowshoeing are restricted to the winter months when there is snow on the ground, disturbance from these activities will not cause significant impacts to wildlife populations or their habitats. We do not expect these activities to cause many adverse impacts because most wildlife species are less active during winter months, many sensitive migratory birds have already left the refuge, and it is not breeding season for the wildlife that may be present. This ensures the refuge will continue to meet the purposes of the Fish and Wildlife Act (1956) and the mission of the Refuge System to manage, conserve and protect fish and wildlife and plant resources on

refuge land. Because ski tracks are typically narrow and trails are on established logging roads, impacts will be minor and therefore not affect the refuge's ability to conserve plant resources as described in the mission of the Refuge System and to protect the ecological integrity of Canaan Valley and its resources, a founding purpose for designation of the refuge in the 1979 EIS.

Providing this access will not affect the refuge's responsibility for wetland protection or wildlife conservation and management as stipulated in the mission of the Refuge System, Emergency Wetlands Resources Act (1986) and the Fish and Wildlife Act (1956). No cross-country ski trails are located on the tracts acquired through the Migratory Bird Conservation Act (1929); therefore allowing this use will not inhibit the refuge from fulfilling the conservation and management of migratory birds on these tracts. Overall, this use conducted as described, will have negligible effects on the refuge's ability to ensure the ecological integrity of Canaan Valley and the resources that the refuge was established to protect. We therefore conclude that cross-country skiing and snowshoeing will not materially interfere with or detract from the mission of the Refuge System or the purposes for which the refuge was established.

SIGNATURE:

Refuge Manager: Kenneth K. Stein /Acting (Signature) 2/14/2011 (Date)

CONCURRENCE:

Regional Chief: Anthony D. Léger (Signature) 02/25/2011 (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: 02/25/2021

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COMPATIBILITY DETERMINATION

USE

Commercial Cross Country Skiing and Snowshoeing to Facilitate Priority Public Uses

REFUGE NAME

Canaan Valley National Wildlife Refuge

DATE ESTABLISHED

August 11, 1994

ESTABLISHING AND ACQUISITION AUTHORITY(IES)

The establishment of Canaan Valley National Wildlife Refuge (refuge) was first approved in an Environmental Impact Statement (EIS) released on May 30, 1979. However, the U.S. Fish and Wildlife Service (Service) decided to await the outcome of litigation surrounding a proposed storage hydroelectric facility before pursuing any further action. The approval of the refuge was affirmed by the Service in a 1994 Final Environmental Assessment and Finding of No Significant Impact on July 11, 1994, which confirmed the adequacy of the previously approved 1979 EIS. The refuge was officially established when the first tract of land was acquired on August 11, 1994. The Service has acquired lands for the Canaan Valley refuge under the following authorities:

1. Fish and Wildlife Act of 1956 [16 U.S.C. 742f(a)(4)]
2. Emergency Wetlands Resources Act of 1986 [16 U.S.C. 3901b]
3. Migratory Bird Conservation Act of 1929 [16 U.S.C. 715d]

REFUGE PURPOSE(S)

The refuge was established to ensure the ecological integrity of Canaan Valley and the continued availability of its wetland, botanical, and wildlife resources to the citizens of West Virginia and the United States (USFWS 1979, 1994). Additional refuge purposes as derived from the legislative authorities are as follows:

(1) "... for the development, advancement, management, conservation, and protection of fish and wildlife resources..." (Fish and Wildlife Act of 1956; 16 U.S.C. 742f (a)(4));

(2) "... for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions." (Emergency Wetlands Resources Act of 1986; 16 U.S.C. 3901(b)); and,

(3) "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (Migratory Bird Conservation Act of 1929; 16 U.S.C. 715d).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

The mission of the National Wildlife Refuge System (Refuge System) is "to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." 16 U.S.C. 668dd (a)(2) (National Wildlife Refuge System Improvement Act of 1997).

DESCRIPTION OF USE

(a) What is the use? Is it a priority public use?
The uses are commercial cross-country skiing and snowshoeing on 10 miles of designated trails on the refuge. While these uses are not priority public uses, they facilitate visitor participation in priority public uses (e.g., wildlife observation and photography).

(b) Where will these uses be conducted?
White Grass Touring Center (White Grass) is a commercial operation that offers snowshoeing and cross-country skiing on 10 miles of trails located on refuge lands. See map B-2 for locations of commercial cross-country ski and snowshoe trails.

(c) When will the uses be conducted?
These uses occur in the winter when there is sufficient snow to allow the activities and when the refuge is open to the public. Most commercial cross-country skiing and snowshoeing occur mid-November through mid-March. Currently the refuge is open daily from one hour before sunrise until one hour after sunset.

(d) How will the uses be conducted?
The refuge permits White Grass to maintain and use approximately 10 miles of trails on the Kelly-Elkins and Graham tracts. Trails are accessed from Forest Road (FR) 80 or through the White Grass lodge parking area. This use has been authorized by annual special use permits (SUP) since 1999 when the Kelly-Elkins and Graham tracts were acquired by the refuge. Each annual SUP specifies terms, conditions, methods, and activities that are authorized.

(e) Why are these uses being proposed?
White Grass has operated a cross-country skiing and snowshoeing operation here since 1979, and has been operating under an annual SUP since the Service acquired the property in 1999. While commercial cross-country skiing and snowshoeing are not priority public uses, they provide opportunities for visitors to observe and learn about the Refuge System, Canaan Valley refuge, and wildlife and habitats firsthand. During winter months snow cover limits pedestrian access to much of the refuge. Visitors skiing and snowshoeing on the refuge are able to engage in priority public uses such as wildlife observation and photography during times when it would be otherwise too difficult because of snow depths. These uses essentially permit the majority of wildlife observation, education and interpretation to occur at the refuge (outside the visitor's center) during winter months when there is snow cover.

Although much of the bird life is gone for the season and many mammal species are dormant or active only at night, this activity does provide opportunities for wildlife observation. Winter species such as chickadees, nuthatches and ravens are commonly observed. Mammal tracks are used to interpret the area's wildlife populations during winter months. This exposure may lead to a better understanding of and interest in natural ecosystems, the importance of national wildlife refuges, and the role of the Service in protecting and restoring natural resources. Additionally the permittee is required to provide environmental education programs regularly throughout the season. These programs are always well received with typically 40 or more participants and require minimal staff oversight. This use allows the refuge to reach large numbers of people of a unique demographic during otherwise low visitation periods.

AVAILABILITY OF RESOURCES

The following list estimates the required costs for the refuge to administer and manage commercial cross-country skiing on the refuge. They do not include the costs of new construction, kiosks, signs, and other costs associated with the CCP. These costs are described in appendix E in a Refuge Operating and Needs and Service Asset Maintenance Management System data list. They also do not cover un-anticipated costs such as participation in search and rescue operations. The refuge officer is the primary contact for any emergency operations on the refuge, however local resources are available to assist and provide significant resources if necessary. Because such an incident is uncommon and unpredictable, these costs are not assumed in the resources estimate below.

COSTS

Staff time associated with administration of this use is related to administration of the SUP, maintaining kiosks and gates, sign-posting roads and trails, informing the public about new refuge uses, conducting visitor use surveys, analyzing visitor use patterns, monitoring the effects of public uses on refuge resources and visitors, and providing information to the public and enforcing refuge regulations. All trail maintenance and repair is conducted by White Grass staff and volunteers.

Annual costs associated with the administration of trail use on the refuge are estimated below:

Kiosk Maintenance and Repair:

- WG-10 Equipment Operator for 1 work days = $262.91

Planning trail connections, working with partners

- GS-13 Refuge Manager for 1 working days = $450.24

Administration of permits, meetings with White Grass staff, Consultations with refuge staff

- GS-11/12 Deputy Refuge Manager for 2 work days = $608.14

Law enforcement, monitoring trail users and their interactions with each other, visitor services, and sign maintenance needs while conducting other LE activities.

- GS-9 Refuge Officer for 10 work days = $2457.60

Monitoring environmental effects of pedestrian travel

- GS-11 Wildlife Biologist for 2 work days (monitoring) = $594.56
- GS-7 Biological Science Technician for 2 work days (monitoring) = $1406.16

Providing information to the public, working with and training Adopt a Trail volunteers, evaluating and planning trail improvements, and analyzing traffic counter and user data

- GS-11 Park Ranger for 10 work days = $3530.40
- Vehicle fuel / law enforcement patrols = $100.00

Total Estimated Costs = $9410.01

FY 2009 Budget Allocations:

Employee Salaries and benefits = $624,039.5
Fixed costs (utilities, fuel, administrative) = $211,415.23
Base maintenance = $50,000
Discretionary Funds (maps, printing, etc.) = $62,243.32
Total Available Funds for FY 2009 = $947,698.08

The financial and staff resources necessary to provide and administer these uses at their current levels are now available. We expect the resources to continue in the future, subject to availability of appropriated funds.

ANTICIPATED IMPACTS OF THE USE

Commercial operations on the Kelly-Elkins and Graham tracts include pre- and post-season trail maintenance and grooming operations during ski seasons. Ski trails that are maintained vary in width, from approximately four feet to 15 feet. Maintenance during the ski season involves grooming established ski trails with a snowmobile. Snowmobile use is limited to necessary trail maintenance operations only. No recreational snowmobile use is allowed.

During the ski season (November - April) an average of 5,000 skiers use the trails on the Kelly-Elkins and Graham tracts. Annual user fluctuations depend on snow cover and timing and can vary from 3,000 to over 7,000 visitors during the season. This, in addition to grooming activities, could cause temporary wildlife disturbances to mammals and bird species on these tracts. In general, negative effects on habitat and wildlife associated with these activities are considered minimal. Mammals are less active during winter months, sensitive migratory birds have largely left the refuge, and it is not breeding season for any of the wildlife that may be present. Commercial cross-country skiing and snowshoeing also are limited to winter and require sufficient snow cover to allow access. Additionally, public use of this area is typically concentrated on weekends when there is snow. Therefore the effects of the use are concentrated on the weekends so that wildlife disturbance is not constant. Surface water and soil may be frozen for at least a portion of this time, most vegetation is dormant, and sensitive habitat will largely be protected by a surface layer of snow. In addition, skis and snowshoes are designed to distribute weight, decreasing potential for eroding soils near waterways. Commercial skiing and snowshoeing are limited to established roads and trails, and no recreational snowmobiles are allowed. Following are more specific descriptions of potential impacts associated with cross-country skiing and snowshoeing.

Effects on Hydrology and Water Quality: Visitor use has the potential to contaminate the Blackwater River and its tributaries through soil sedimentation into streams caused by trail maintenance and grooming efforts or from actual skiing and snowshoeing. There may also be runoff of petroleum products from parking lots or snowmobiles used for trail grooming.

There may be additional impacts to water resources where trails cross the refuge's rivers, streams, and tributaries increasing the potential short-term and long-term downstream erosion and sedimentation. Additional visitor use also increases the potential for contaminating rivers, streams, and open water through the runoff of petroleum products from parking lots. Trail maintenance activities associated with the commercial operation may have negative effects on hydrology and water quality. Trail grooming during the ski season involves the use of snowmobiles. As mentioned previously, snowmobiles can be a source of petroleum products that can contaminate water sources and operating these machines near waterways may lead increased soil erosion and sedimentation in the water.

The refuge minimizes adverse effects on water resources in a variety of ways. Refuge staff routinely monitors roads and trails for damage and White Grass is required to remediate problems as described in the permit. Commercial trail maintenance and grooming activities must comply with the terms and conditions of the annual SUP, ensuring any potential negative effects are minimized. The refuge also conducts public outreach efforts to notify visitors of proper precautions, including carrying out all trash. This helps minimize risks associated with visitor use on the refuge. Because of these efforts, combined with the seasonal limitations, trail restrictions, and stipulations listed in this document, impacts to water resources are expected to be minimal.

Effects on Vegetation: Short-term effects consist of the deterioration of plant material, whereas long-term effects of trampling include direct and indirect effects on vegetation and soils like diminishing soil porosity,

aeration and nutrient availability through soil compaction (Kuss 1986, Roovers et al. 2004). Compaction of soils thus limits the ability of plants, particularly rare and sensitive species, to revegetate affected areas (Hammitt and Cole 1998). Kuss (1986) found, plant species adapted to wet or moist habitats are the most sensitive and increased moisture content reduces the ability of the soil to support recreational traffic.

Overall effects on vegetation are expected to be minimal. As mentioned previously, skiing and snowshoeing are limited to winter and require sufficient snow cover to allow access. Vegetation is largely dormant during the winter and will largely be protected by a surface layer of snow. In addition, skis and snowshoes are designed to distribute weight, decreasing potential for compacting or eroding soils and trampling vegetation. Skiing and snowshoeing are limited to designated roads and trails, and no recreational snowmobiling is allowed. Designated roads and trails do not have any known occurrences of rare plant species on their surface that would be impacted by these uses. Some rare plants have been documented in habitat adjacent to trails. Users leaving designated trails could adversely affect adjacent vegetation; however, because of the time of year and low numbers of visitors expected to leave the trails, negative effects are expected to minimal.

While recreational snowmobiling is not allowed, snow mobiles are authorized to groom the commercial trails. In-season trail grooming is limited to the commercial trails. To protect natural resources in the area, the refuge specifies appropriate terms and conditions for snow mobile grooming in the company's annual SUP. Trails will be monitored, any problem areas will be identified, and appropriate restoration and protection efforts will be made. If adverse impacts to vegetation are observed, the refuge will take necessary measures, such as remediation and trail closures, to restore plant communities.

Effects on Soils: Soils can be compacted and eroded as a result of continued use of roads and trails. The Mauch Chunk-derived soil in Canaan Valley is particularly vulnerable to mechanical erosion when the vegetation has been removed (Rizzo 2002). If compacted, Mauch Chunk soils can facilitate rapid water runoff that accelerates erosion down slope (Rizzo 2002).

Trail maintenance and grooming on the commercial trails could have negative effects on soils. In general, trail maintenance involves using hand tools or small motorized equipment (e.g., chain saws and all-terrain vehicles (ATV) in the off-season) to keep trails clear. Maintenance crews use snowmobiles to access trails for maintenance in the winter. The bulk of the work is done by foot access in the off-season. Trail maintenance and grooming associated with the commercial trails is addressed under the annual SUP. This permit stipulates a series of requirements to minimize or avoid any potential negative effects. Trail maintenance activities are limited to occur only between October and April of each year, which avoids the growing and breeding season of most species.

Overall effects on soils are expected to be minimal. Commercial cross-country skiing and snowshoeing are limited to winter and require sufficient snow cover to allow access. The soil surface will likely be frozen for some of the season, making it much less vulnerable to compaction or erosion. When these activities are occurring, soils also will largely be protected by a surface layer of snow. In addition, skis and snow shoes are designed to distribute weight, decreasing potential for compacting or eroding soils. Over the long-term, the risk of erosion and sedimentation problems that might affect soils in these habitats would increase with increased visitor use and trail use. However, given the time of year, locations, and methods used, increased levels of skiing and snowshoeing are not expected to significantly affect soils on the refuge.

Effects on Wildlife: Short-term and long-term adverse impacts are expected for wildlife populations in relation to increasing trail miles and visitor use. Disturbances will vary by wildlife species involved and the type, level, frequency, duration and the time of year activities occur. Beale and Monaghan (2004) found that adverse effects to wildlife increase as number of users increase. The study found that an animal's response to one visitor walking down a trail is entirely different than its response to a group of users walking down a trail.

The high density of trails per acre on the Kelly-Elkins and Graham tracts increases the likelihood of wildlife disturbance. The effects of roads and trails on plants and animals are complex and not limited to trail width. Trail use can disturb areas outside the immediate trail corridor (Trails and Wildlife Task Force 1998, Miller et al. 2001). Miller et al. (1998) describe a 75-meter zone of influence where bird abundance and nesting activities (including nest success) were found to be affected based on distance to the trail. Bird communities in this study were apparently affected by the presence of recreational roads and trails, where common species (e.g., American robins) were found near trails and rare species (e.g., grasshopper sparrows) were found farther from trails. Songbird nest failure was also greater near trails (Miller et al. 1998). Taylor and Knight (2003) describe

a similar disturbance zone of 100 meters for mammals in which mammal activity is affected by trail presence and use. This 100-meter disturbance zone helps demonstrate the potential impacts to wildlife on the cross-country ski and snowshoe trails during the winter months. Using this 100-meter disturbance buffer around the commercial cross-country skiing and snow shoeing trails, it can be concluded that 501 of the 992 acres of the Kelly-Elkins and Graham tracts are potentially impacted by cross-country skiing trails.

The use of trails in the winter for commercial cross-country skiing and snowshoeing have similar wildlife disturbance effects as those which occur through pedestrian travel on these trails during the other seasons. One of the primary differences is that migratory birds are not present and resident species are not breeding or raising young during the winter months. Additionally, many mammal species are less active during winter months. However, winter conditions cause increased stress because of extreme weather conditions and limited food availability (Hammit and Cole 1998). Additionally, some species which are typically more active during evening hours in the summer months increase activity during daylight hours in the winter months often in response to prey species activity patterns. Both bird and mammal species which are present and active can be negatively affected proportionally greater than other times of the year to the same level of disturbance because of these added environmental stressors. Bird species that are common in the wintertime include chickadees, nuthatches and ravens. A variety of mammal tracks are also commonly observed.

Long-term adverse impacts from increased trail miles and trail use might pose a concern to refuge fisheries. Trails that have stream and river crossings would likely degrade over time with increased use and contribute to downstream sedimentation and turbidity, which has been found to be a stressor to brook trout (Sweka and Hartman 2001) and redside dace (Holm and Crossman 1986) populations that are sensitive to habitat degradation. The refuge will monitor stream and river crossings closely and remediate any damaged areas to minimize adverse impacts associated with trail use. However, during winter months when the ground is frozen, erosive potential of soils are reduced and impacts of cross-country ski use will be minimal to erosion and sedimentation of aquatic habitats. Small bridges are erected over drainages on the Kelly-Elkins and Graham tracts at the beginning of each ski season to further protect streams from erosive effects of this use.

Trail maintenance on the commercial trails could disturb a variety of wildlife including white-tailed deer, black bear, turkey and a variety of migratory birds. Using snow mobiles to groom trails may also disturb over-wintering species (e.g., white-tailed deer). Grooming activities are not permitted at night which protects nocturnal species from disturbance. Conditions for trail maintenance and grooming associated with the commercial trails are addressed under the annual SUP. Stipulations to ensure compatibility are listed at the end of this compatibility determination and include a series of requirements to minimize or avoid any potential negative effects to wildlife or habitat.

West Virginia northern flying squirrels have also been documented on refuge property near the end of FR 80. This species has recently been removed from the endangered species list. The recovery plan (USFWS 2001) notes that habitat modification may create a competitive advantage for the southern flying squirrel (*Glaucomys volans*), although the extent to which a logging road or trail would create conditions conducive for this is unknown. Some research has found northern flying squirrels occupying den sites near logging roads, skid trails, and on hiking trails (Ford 2002). Routes designated for these uses are pre-existing roads and trails some of which have been in existence for many years. No new habitat clearing is planned in this area; however, some vegetation clearing may be required for maintaining the trail corridor.

As mentioned previously, we will periodically evaluate these activities to determine any effects they may have. If evidence of unacceptable adverse impacts appears, the location(s) of activities will be curtailed or discontinued as needed. We will take all necessary measures to mitigate any negative effects on wildlife associated with skiing and snowshoeing. We will evaluate roads, trails, and activities periodically to assess potential negative effects. If evidence of unacceptable adverse effects is observed, we will curtail or discontinue activities as needed. We will post and enforce refuge regulations, and establish, post, and enforce closed areas as needed. However, negative effects on wildlife are expected to be minimal. As discussed previously, cross-country skiing and snowshoeing are limited to winter months and require sufficient snow levels to allow access.

The refuge also recognizes that large group sizes may amplify negative effects to wildlife. Therefore, groups larger than 10 are required to notify the refuge prior to visiting to determine if a SUP will be needed. Requiring large groups to contact the refuge prior to visiting will also enable the refuge to understand which trails are

preferred by large groups, and to monitor any potential excessive wildlife disturbance created by large groups. Having the ability to monitor these kinds of disturbances will enable the refuge to mitigate impacts associated with large groups. Examples of mitigation may include directing large groups to less sensitive habitats during breeding seasons or assigning refuge staff to lead or meet with the group while on refuge lands. Limiting group size will also increase the quality of the experience and decrease the potential of conflicting with other users' experience.

Effects on Threatened and Endangered Species: There are two Federally listed species known to occur on the refuge, and one species that has recently been de-listed, as discussed in the previous section. Cheat Mountain salamanders (*Plethodon nettingi*), listed as threatened, have been documented near the upper section of FR 80, and near the cross-country ski trails in that area. Indiana bats (*Myotis sodalis*), listed as endangered, are known to use the refuge's forested areas for summer foraging and may have a summer maternity colony on refuge lands as well. The refuge requested Section 7 informal consultation with the Service's West Virginia Field Office (WVFO) under the Endangered Species Act (16 U.S.C. 1536) on all the actions in this CCP, including commercial cross-country skiing and snowshoeing, that could potentially impact listed species. This process resulted in a finding that the proposed actions are not likely to adversely affect the listed species or their associated habitats on the refuge. The full intra-Service Section 7 Biological Evaluation form can be found in appendix H of this CCP.

Cheat Mountain salamander—Public use on Powderline and Three-Mile Trail only occurs during winter months by cross-country skiing and snow shoe access when there is snow on the ground. During these times of year, salamanders are not active and are underground (USFWS 2009). Furthermore, because these trails are not open to the public outside of the winter time, the trails and the substrate on the trails remain undisturbed during the time of year when the salamanders are active. Therefore these public uses are not likely to adversely affect Cheat Mountain salamanders.

These old roads, now public use ski trails, have an altered micro-habitat and are not habitat for Cheat Mountain salamanders; therefore, we do not expect this species to be living in these trails. Therefore, the potential for Cheat Mountain salamanders to be present on the trails is limited to salamanders occasionally crossing the trail.

Salamanders may cross the trail in low numbers until temperatures drop and the salamanders are no longer active and present on the surface. Their presence on the surface is temperature and moisture dependent, thus dates of emergence and submergence depend on these environmental factors and can vary from year to year (Pauley 1978a; 1978b; Pauley 2005 in Pauley 2008). It is estimated that when temperatures are below 55F salamanders are not likely to be active on the surface (USFWS 1991). Based on climate information from 1948 to 2000, average temperatures in Canaan Valley do not exceed 55F until May 14 and fall below 55F after September 26 (Brooks pers. comm.). Under the current conditions of the SUP, maintenance operations can only occur between October 10 and April 30. This is well beyond when salamanders are likely to be present on the surface. Therefore the chance of direct take is extremely unlikely (discountable).

The chance of direct take from maintenance activities is further limited due to the expected low amount of active maintenance conducted on these trail sections. Maintenance typically occurs on one to two days a year on these higher elevations trails and consists of hand crews with one ATV and trailer to haul equipment. ATV use is limited to usually two passes up and down the trail to move tools (Chase, pers.comm). Maintenance activities typically include the removal of downed trees and limbs which have fallen across the trail during the previous season and maintaining existing waterbars to prevent erosion. Maintenance activities occur within a 4-foot-wide corridor of the trail – two feet in either direction of the center line – as stipulated in the SUP. Any other activities related to trail maintenance occur within the footprint of the trail. The risk of the maintenance crew encountering a salamander is extremely unlikely to occur (discountable).

Trails have been noted as impediments to Cheat Mountain salamander movements, possibly fragmenting and genetically isolating populations as well as making these populations more vulnerable to stochastic events. Pauley (unpublished data in USFWS 1991) found that roads, and potentially some trails, serve as barriers that prevent territories of different individuals from overlapping, thus fragmenting populations and gene pools. Heavily traveled trails can result in removal of leaves and other forest litter, leaving bare trail treads (USFWS 1991; WVDNR 2000, 1999). Preliminary data suggest that the salamander rarely cross trails and other openings

that lack sufficient leaf litter cover (Pauley 2005 in Pauley and Waldron 2008). Cheat Mountain salamander use forest floor litter as foraging cover and refugia, especially during the day. Therefore, the extent to which trails and roads serve as a barrier to the salamander most likely depends on the site-specific characteristics such as width, canopy cover, substrate material, compaction, and level/type of use.

Conditions related to blocking movements for salamanders appear to be related to increased temperature and humidity resulting from an open tree canopy as well as the removal of vegetation and leaf litter through public use activities creating bare soil conditions. The cross-country ski trails that White Grass maintains are not used outside the ski season for public use and are not heavily traveled. Therefore excessive trampling resulting in the removal of litter and vegetation to create bare dirt surfaces does not occur on these trails. Because habitat on the trail is predominately grass and fern cover with limited rock and woody debris, it likely permits salamanders to move across the trail. In addition, both Powderline and Three-Mile trails are narrow and have partial canopy cover providing shading and cooling effects to the trail surface. This creates more suitable conditions for salamanders to move across the trail. The lack of bare soil conditions coupled with the presence of canopy cover suggest that these trails do not create a barrier to salamander movement.

We do not expect the presence of these trails to fragment these populations creating genetic barriers. For this reason the trails are not likely to cause indirect adverse effects to Cheat Mountain salamanders.

Additional benefits to Cheat Mountain salamander populations are expected from reforestation of the edges of Powderline and Three-Mile cross-country ski trails.

The CCP therefore calls for creating a vegetated buffer of native tree species along these trails. Planting native tree species such as red spruce along the trails will eventually provide a more closed canopy over the trail and improve substrate and vegetation on the trail itself. Native tree species will eventually shade out all of the grass and fern cover which currently dominates the trails, and will improve microhabitat conditions for salamanders by increasing leaf litter, woody debris, and soil moisture (USFWS 1991). These trail improvements will provide a more conducive corridor for Cheat Mountain salamanders to move between upslope and downslope populations. Revegetation of refuge cross-country ski trails and increasing canopy cover is an additional conservation measure the refuge can accomplish to further enhance habitat conditions for the salamander.

In the future, the refuge will also consider other options such as replacing trail segments with boardwalks to further facilitate salamander movement across trails. This action is one of the recommended management guidelines in the recovery plan for this species (USFWS 1991). In 2009, the Monongahela National Forest initiated a study to design more effective road and trail maintenance activities to benefit Cheat Mountain salamander populations (Pauley and Waldron 2008). If those results apply to habitats on the Canaan Valley refuge, the refuge will consider implementation of similar measures.

Indiana Bat—Indiana bats were documented on the refuge for the first time through acoustical monitoring conducted by the U.S. Forest Service in 2003 (Ford 2003). Indiana bats were found foraging at two locations in the south end of the refuge. The refuge began conducting acoustical surveys in 2005. These surveys have documented three likely Indiana bat observations in the same location as the 2003 survey during 2005, 2007, and 2008. Additionally, acoustical surveys documented one new location for the species during 2007. Indiana bat calls have been documented from the refuge in the months of May, July, August, and September. It is likely that Indiana bats use the Kelly-Elkins property for foraging habitat, particularly in openings such as the existing logging roads and maintained ski trails. Commercial cross-country skiing and snowshoeing are not likely to cause impacts to this species as these activities will not be disrupting hibernacula during the winter months or disrupting foraging activities the remainder of the year.

Because of seasonal restrictions and the lack of hibernacula on the refuge, no adverse effects are expected on Indiana bats during the ski/snow shoe season. It is possible that trail maintenance activities on commercial trails could cause minor disturbances to this species; however, since these activities have been occurring for many years, are restricted to day time hours, and must comply with the terms and conditions of the SUP, any potential negative effects are expected to be minimal. We will periodically evaluate these activities to determine any effects they may have on listed species, and we will initiate consultation with the Service's West Virginia Field Office whenever needed. If evidence of adverse effects appears, the location(s) of activities will be curtailed

or discontinued as needed. Under the described conditions and use levels, these public uses will not cause any direct or indirect adverse effects to threatened or endangered species.

CONCLUSION

At current and projected levels of use, potential negative effects from commercial cross-country skiing and snowshoeing are not considered significant. The effects will be temporary in duration and are not expected to cause serious changes in wildlife behavior. As with other activities, we will continue to minimize potential negative effects on hydrology and water quality, soils, vegetation, and wildlife. This includes regular maintenance operations to ensure trail stability and erosion control measures. Trails and roads will be monitored for potential negative effects. If evidence of unacceptable adverse effects is observed, we will curtail or discontinue these activities as needed to protect wildlife and habitat. We will post and enforce refuge regulations, and establish, post, and enforce closed areas as needed.

In addition to the above measures, the annual SUP authorizing commercial cross-country skiing and snowshoeing outlines specific maintenance and grooming methods that may be used as well as timing, duration, and any other requirements. These requirements ensure minimal negative effects on soil, habitat, and wildlife.

PUBLIC REVIEW AND COMMENT

This compatibility determination was released concurrent with the draft Comprehensive Conservation Plan/ Environmental Assessment for a 45-day public review and comment period.

DETERMINATION (CHECK ONE BELOW):

_____ Use is not compatible

__**X**__ Use is compatible with the following stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

The refuge has developed a list of criteria for determining whether any given route would be appropriate for public uses, including commercial cross-country skiing and snowshoeing. These criteria apply to current and future trails. Criteria are as follows:

Checklist for Existing Routes to Be Eligible for Compatibility Consideration
(Routes must meet all criteria)

1. Route provides an opportunity to view a variety of habitats and wildlife.
2. Route is safe for the access proposed at current use levels.
3. Route requires minimal annual maintenance (i.e, waterbars, stepping stones, etc.) to ensure safe access and to prevent further habitat degradation.
4. Route has a low potential for fragmenting habitat or disturbing wildlife populations.
5. Based on existing soils information, less than 50 percent of the route's length occupies soil types rated as high or very high for compaction and/or erosiveness. The route is not rated as severely limited for hiking trails based on the Tucker County Soil Survey.

6. Any route crossing of sensitive soils occupies the shortest possible distance. Organic soil crossings are minimized or eliminated.

7. Continued use of the existing route is not likely to cause further wetland alteration or degradation. There is low risk that hydrology, soil stability, sensitive plant communities, riparian zones, and wildlife habitats would be adversely affected.

8. Route predominately occupies modified substrate (graveled, compacted, or filled) like logging roads and rail grades.

9. Route is not incised greater than 1 foot deep over 10 percent of its total length.

Additional Stipulations to ensure compatibility:

— Refuge regulations will be posted and enforced. Closed areas will be established as needed, posted, and enforced. Signs necessary for visitor information, safety, and traffic control will be kept up to date.

— The known presence of a threatened or endangered species will preclude the use of an area until the refuge manager determines otherwise.

— Commercial snowshoeing and cross-country skiing are only compatible on designated roads and trails.

— Commercial snowshoeing and cross-country skiing are restricted to refuge open hours: 1 hour before sunrise until 1 hour after sunset. Night grooming is prohibited.

— Skiing off designated open trails by permittee staff and customers is prohibited.

— Trail clearing (cutting woody vegetation) can occur only from the center point of the existing trail to two feet on either side of the center point to create a corridor four feet wide, even if the trail itself is wider than four feet.

— Trail clearing operations must only be performed from October 10 through April 30.

— The use of all-terrain vehicles is prohibited except for spring and fall maintenance operations.

— A written trail maintenance schedule will be submitted and approved by the refuge manager prior to initiating any trail maintenance.

— All material removed from the permitted ski trails during trail maintenance will be placed on the side of the trail. The removal of any materials from the refuge, including wood, is prohibited.

— Snowmobiles may be used for trail grooming and skier rescue operations only. No recreational snowmobile is permitted.

— Permittee will work with the refuge to develop and provide monthly interpretive programs that teach visitors about the refuge system, local ecology, and the environment.

— The refuge conducts an outreach program to promote public awareness and compliance with public use regulations on the refuge. The permittee is required to conduct monthly outreach and education programs related to refuge resources, and the local ecology to further visitors' understanding of the Refuge System and the purposes of the refuge.

— All routes designated for public access are annually inspected for maintenance needs. Prompt action is taken to correct any conditions that risk public safety. Roads and trails are maintained at a level that reasonably accounts for safe travel. Roads are not plowed in winter and non-commercial trails are not groomed.

— Routes designated for cross-country use on Kelly-Elkins and Graham Tract are monitored annually to determine if they continue to meet the compatibility criteria established by the refuge. Should monitoring and evaluation of the use(s) indicate that the compatibility criteria are or will be exceeded, appropriate action will be taken to ensure continued compatibility, including modifying or discontinuing the use.

— Routine law enforcement patrols are conducted. The patrols promote education and compliance with refuge regulations, monitor public use patterns and public safety, and document visitor interaction.

— The commercial skiing operation must obtain and abide by a SUP annually. All other organizations conducting for-profit group tours or activities on the refuge must also obtain and abide by a SUP. A fee may be charged for the SUP. The areas used by permit will be closely monitored to evaluate the impacts on the resource. If adverse impacts appear, the activity will be curtailed or discontinued.

— Potential conflicts with other public uses such as hunting, interpretation, etc. will be minimized by using trailhead signs and other media to inform the visitors about current public use activities as well as which activities are authorized in specific locations throughout the refuge.

— The SUP is granted upon the express condition that the United States of America, its agents and employees shall be free from any and all liabilities and claims for damages, injuries, and/or suits for or by reason of any injury to any person or property of any kind whatsoever, whether to the person or property of the permitee, its agents, employees, members, or third parties, from any cause or causes whatsoever, including ordinary negligence attributable to the United States, while in or upon the Canaan Valley National Wildlife Refuge during the term of this permit, arising out of or in any way connected to any of the activities authorized under this permit, including but not limited to the use of refuge lands for skiing or other recreational activities, during the term of this permit, and the permitee hereby covenants and agrees to indemnify, defend, save and hold harmless the United States of America, its agents and employees from all such liabilities, expenses and costs on account of or by reason of any property damage, personal injuries, deaths, liabilities, claims, suits or losses however occurring or damages arising out of the same. This obligation shall survive the termination of the agreement and is intended to be as broad and inclusive as permitted by the laws of the State of West Virginia and if any portion hereof is held invalid, it is agreed that the balance shall, notwithstanding, continue in full legal force and effect.

— The permitee shall prior to the effective date of the permit provide the refuge manager with a Certificate of Insurance evidencing that it has obtained and will maintain during the term of this agreement Comprehensive General Liability and Property Damage insurance against claims occasioned by the actions or omissions of the permitee, its agents and employees in carrying out the activities and operations authorized hereunder. Such insurance shall be in an amount commensurate with the degree of risk and the scope and size of such activities authorized hereunder, but in any event, the limits of liability shall not be less than $2,000,000 per occurrence and $5,000,000 aggregate. If claims reduce available insurance below the required per occurrence limits, the permitee shall obtain additional insurance to restore the required limits. An umbrella or excess liability policy, in addition to a Comprehensive General Liability Policy, may be used to achieve the required limits. All liability policies shall name the United States of America as a named insured or shall specify that the insurance company shall have no right of subrogation against the United States and shall have no recourse against the Government for payment of any premium or assessment.

JUSTIFICATION

One of the secondary goals of the Refuge System is to provide opportunities for the public to develop an understanding for wildlife wherever those opportunities are compatible. Commercial cross-country skiing and snowshoeing provide increased opportunities for viewing wildlife and habitats with relatively low levels of disturbance. Visitors participating in this activity will be directly engaged in wildlife observation, education, interpretation and photography which are identified in the National Wildlife Refuge Improvement Act of 1997 as the priority public uses of the Refuge System. Additionally, during much of the winter season when there is deep snow cover on the refuge, cross-country skiing and snowshoeing are often the only methods available for facilitating priority public uses. The Service and the Refuge System have established goals of providing opportunities for the public to observe wildlife and habitats. Commercial cross-country skiing and snowshoeing provide additional opportunities for viewing wildlife and habitats with relatively low levels of disturbance. It is likely that visitors participating in these activities will learn more about local wildlife and habitats, the refuge, and the Refuge System.

Commercial cross-country skiing and snowshoeing are restricted to designated roads and trails on the Kelly-Elkins and Graham tracts. These activities are limited to winter months and require sufficient snow levels to allow access. These uses essentially permit the majority of wildlife observation, photography, education and interpretation to occur at the refuge (outside the visitor's center) during winter season when there is snow cover. These uses are concentrated, which reduces the overall impact in other portions of the refuge. Habitat which is disturbed represents the largest habitat type that the refuge protects and manages and therefore the disturbance that does occur is offset by the large percentage of similar habitats on the refuge which remain undisturbed.

Because these activities are limited to winter months, the soil surface will be frozen and covered with snow for most of the season, making it much less vulnerable to compaction or erosion. Vegetation is largely dormant during the winter and will be protected by a surface layer of snow. In addition, skis and snowshoes are designed to distribute weight, decreasing the potential for harming vegetation and compacting or eroding soils. Due to trail habitat conditions and limited public use and maintenance on trails through Cheat Mountain salamander habitat there will not likely be adverse effects to the species. Furthermore, the refuge will improve habitat conditions for the Cheat Mountain salamander through trail revegetation on the Kelly-Elkins tract as well as other physical means for improving habitat

Because of the established trail criteria and additional stipulations listed above, cross-country skiing and snowshoeing are considered to be acceptable and manageable methods for facilitating priority public uses at Canaan Valley refuge. Trails open to this use are entirely on upland soils. Small drainages cross these trails but are maintained to ensure proper drainage and are bridged in the winter so that ski and snowshoe use can not cause erosion or sedimentation. Because of the restrictions and management of the trail system, the impact to soils and possible sedimentation of wetland resources are minimized. Therefore these anticipated impacts will not affect the refuge's ability to fulfill the purposes to conserve wetlands of Canaan Valley as established through the Emergency Wetland Resources Act (1986).

This use is concentrated on the Kelly-Elkins and Graham tracts which represent a small portion of the available wildlife habitat which is unaffected by this use. Other public use trails are open to cross-country skiing and snowshoeing, however, road access to trail heads is not maintained and the trails themselves are not groomed on other refuge tracts. This greatly affects the numbers of users on other areas of the refuge and minimizes disturbance to wildlife and other potential impacts to a smaller area of refuge land. We do not expect these activities to cause many adverse impacts because most mammal species are less active during winter months, amphibians are dormant, many sensitive migratory birds have already left the refuge, and it is not breeding season for the wildlife that may be present.

Although some species of birds, small mammals and deer may be observed and disturbed by this activity, the overall effects will be mitigated by the lower numbers encountered, and the abundance of similar habitat which is not affected by this use. Most mammal observations during winter are typically through the interpretation of tracks left from night time activities, therefore most mammal disturbance will be minimal as this activity is not permitted at night. This ensures the refuge will continue to meet the purposes of the Fish and Wildlife Act (1956) and the mission of the Refuge System to manage, conserve and protect fish and wildlife and plant resources on refuge land. Because ski trails are typically narrow and are on established logging roads, impacts will be minor and therefore not affect the refuge's ability to conserve plant resources as described in the mission of the Refuge System and to protect the ecological integrity of Canaan Valley and its resources, a founding purpose for designation of the refuge in the 1979 EIS.

Providing this access will not affect the refuge's responsibility for wetland protection or wildlife conservation and management as stipulated in the mission of the Refuge System, Emergency Wetlands Resources Act (1986) and the Fish and Wildlife Act (1956). No cross-country ski trails are located on the tracts acquired through the Migratory Bird Conservation Act (1929); therefore allowing this use will not inhibit the refuge from fulfilling the conservation and management of migratory birds on these tracts. Issuance of the SUP will include stipulations to ensure the compatibility of this use. These stipulations will include specific maintenance and grooming methods. This activity directly contributes to the mission of the Refuge System, as required by 50 Code of Federal Regulations §29.1, by facilitating the main opportunities for wildlife observation, education, interpretation and photography during winter months. Overall, this use, conducted as described, will have negligible effects on the refuge's ability to ensure the ecological integrity of Canaan Valley and the resources that the refuge was established to protect. We therefore conclude that commercial cross-country skiing and snowshoeing will not materially interfere with or detract from the mission of the Refuge System or the purposes for which the refuge was established.

SIGNATURE:

Refuge Manager: Kenneth K. Stein /Acting _____ 2/14/2011
(Signature) (Date)

CONCURRENCE:

Regional Chief: Cynthia D. Séger _____ 02/25/2011
(Signature) (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: 02/25/2021

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COMPATIBILITY DETERMINATION

USE

Horseback Riding to Facilitate Priority Public Uses

REFUGE NAME

Canaan Valley National Wildlife Refuge

DATE ESTABLISHED

August 11, 1994

ESTABLISHING AND ACQUISITION AUTHORITY

The establishment of Canaan Valley National Wildlife Refuge (refuge) was first approved in an Environmental Impact Statement (EIS) released on May 30, 1979. However, the U.S. Fish and Wildlife Service (Service) decided to await the outcome of litigation surrounding a proposed storage hydroelectric facility before pursuing any further action. The approval of the refuge was affirmed by the Service in a 1994 Final Environmental Assessment and Finding of No Significant Impact on July 11, 1994, which confirmed the adequacy of the previously approved 1979 EIS. The refuge was officially established when the first tract of land was acquired on August 11, 1994. The Service has acquired lands for the Canaan Valley National Wildlife Refuge (refuge) under the following authorities:

1. Fish and Wildlife Act of 1956 [16 U.S.C. 742f(a)(4)]
2. Emergency Wetlands Resources Act of 1986 [16 U.S.C. 3901b]
3. Migratory Bird Conservation Act of 1929 [16 U.S.C 715d]

REFUGE PURPOSES

The refuge was established to ensure the ecological integrity of Canaan Valley and the continued availability of its wetland, botanical, and wildlife resources to the citizens of West Virginia and the United States. Additional refuge purposes as derived from the legislative authorities are as follows:

(1) "... for the development, advancement, management, conservation, and protection of fish and wildlife resources..." (Fish and Wildlife Act of 1956; 16 U.S.C. 742f (a)(4));

(2) "... for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions." (Emergency Wetlands Resources Act of 1986; 16 U.S.C. 3901(b)); and,

(3) "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (Migratory Bird Conservation Act of 1929; 16 U.S.C. 715d).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

The mission of the National Wildlife Refuge System (Refuge System) is "to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." National Wildlife Refuge System Improvement Act, 16 U.S.C § 668dd (a)(2).

DESCRIPTION OF USE

(a) What is the use? Is it a priority public use?
The use is horseback riding. Although horseback riding is not a priority public use within the Refuge System, it facilitates wildlife-dependent, recreational uses such as wildlife observation and photography.

(b) Where will these uses be conducted?
Horseback riding is allowed on current designated roads and trails, and on any new trails as described in the Comprehensive Conservation Plan (CCP). See map B-2 for locations of trails that will permit horseback riding.

(c) When will the uses be conducted?
Horseback riding is authorized on designated roads and trails year-round. Daily use hours are from one hour before sunrise until one hour after sunset.

(d) How will the uses be conducted?
Riders either travel to the refuge on horseback and enter at public entry points or transport their horse by vehicle and trailers and depart from designated parking areas. Information kiosks identify the roads and trails open for travel and explain permitted public uses. Current designated wildlife observation trails on the refuge are described in the trail brochure. As trail connections are made, refuge brochures and kiosks will be updated to show all designated trails. Parking lots and kiosks have been constructed at the trailheads of refuge trails.

Designated roads and trails also have sufficient viewing distance for riders to detect the approach of other users and maneuver to accommodate them. Horses must be accompanied by riders at all times and not tied to trees or confined. Horseback riding is typically seasonal with the majority of the use occurring during summer and fall months.

(e) Why are these uses being proposed?
Horseback riding on the refuge provides increased opportunity for public participation in and access to the six priority public uses (hunting, fishing, wildlife observation and photography, and environmental education and interpretation). Visitors participating in horseback riding are also participating in one or more of the six priority public uses. Allowing this activity provides visitors with another way to view the refuge's diverse biological assets. Some trails on the refuge are long (4 miles round trip) and horseback riding facilitates access to some of the more remote areas of the refuge. Additionally it creates direct connectivity between the refuge and the Dolly Sods Wilderness Area, a popular destination for equestrian use. This exposure may lead to a better understanding of the importance and value of the Refuge System to the environment and the American people. Horseback riding access has been allowed on the refuge since the refuge was established in 1994, and was determined compatible in a compatibility determination in 2003.

AVAILABILITY OF RESOURCES

The resources necessary to provide and administer road and trail use will require a few additional resources and actions. Staff time associated with administration of this use is related to assessing the need for road and trail maintenance and repair, maintaining kiosks, gates, maintaining traffic counters and recording collected data, sign-posting roads and trails, informing the public about new refuge uses, conducting visitor use surveys, analyzing visitor use patterns, monitoring the effects of public uses on refuge resources and visitors, and providing information to the public about the use. These activities will be conducted in conjunction with the activities outlined in the "Wildlife Observation and Photography," and "Environmental Education and

Interpretation" compatibility determinations and are therefore not additive. Additional resources are necessary for increased monitoring for invasive species to reduce the risk of the introduction and spread of invasive plants from horse use, and for trail maintenance to prevent erosion from horse hooves. Recently invasive species monitoring has been successfully conducted by volunteer efforts along public use trails.

Additional annual costs associated with the administration of horseback access on the refuge are estimated below:

Administration, planning and consultation with refuge staff:

- GS-13 Refuge Manager for 1 work days = $450.24

Planning and monitoring trail conditions for effects of horseback access

- GS-12 Wildlife Biologist for 2 work days = $735.04
- GS-7 Biological Technician for 7 work days = $1,406.16

Providing information to the public and analyzing user data

- GS-11 Park Ranger for 4 work days = $1,412.16

Maintenance operations to improve trail conditions directly associated with horse damage

- WG-10 Equipment Operator for 2 work days = $545.12

Herbicide and Supplies = $200.00

Heavy Equipment Fuel = $250.00

Grand Total Costs= $4,998.72

FY 2009 Budget Allocations:

Employee Salaries and benefits = $624,039.53
Fixed costs (utilities, fuel, administrative) = $211,415.2
Base maintenance = $50,000
Discretionary Funds (maps, printing, etc.) = $62,243.32
Total Available Funds for FY 2009 = $947,698.08

The financial and staff resources necessary to provide and administer these uses at their current levels are now available. We expect the resources to continue in the future, subject to availability of appropriated funds. As stated above, we will need additional resources to expand and enhance these uses as described in the CCP.

ANTICIPATED IMPACTS OF USE

Horseback riding has the potential to affect a variety of migratory and resident wildlife and their habitats when they are close to the travel routes. Possible negative effects include disturbing wildlife, removing or trampling vegetation, littering, vandalism, and entering closed areas. However, visitor use associated with this activity is relatively low. Out of 44 monitoring days (mostly weekends) between September 2002 and July 2003, five horseback riders were documented on refuge roads and trails. Anticipated levels of use are higher on Forest Road (FR) 80 which is more popular with horseback riders due to the connection with U.S. Forest Service

Property. Although no direct monitoring has occurred for horse use on FR 80, incidental observations by refuge staff indicate that this road is one of the most popular routes on refuge land for this use.

Effects on Hydrology and Water Quality: Visitor use has the potential to contaminate refuge wetlands, and the Blackwater River and its tributaries, through soil sedimentation from horseback riding into streams and runoff of petroleum products from parking lots. Additionally horse use has been linked to increased coliform bacteria from fecal contamination in at least one study in wilderness areas (Derlet et al 2008). However, this research was conducted in areas used heavily by pack horses and in some areas by cattle. Maintaining trails for horse use away from water sources and minimizing the area used for stream crossings will reduce the risk of fecal contamination. The risk of contamination from petroleum products originating from vehicles in parking areas is no greater than other forms of public use permitted on the refuge. Trail maintenance may cause short term erosion and sedimentation in area waters. There may be additional impacts to water resources where new trails cross the refuge's rivers, streams, and tributaries increasing the potential short-term and long-term downstream erosion and sedimentation. Additional visitor use also increases the potential for contaminating rivers, streams, and open water through the runoff of petroleum products from parking lots. However, refuge parking lots are situated away from wetlands, in well-drained areas that can absorb potential contaminants without harm to water quality.

Roads and trails used for horseback riding can affect the hydrology of an area, primarily through alteration of drainage patterns. Bartgis and Berdine (1991) note that roads and trails can divert water from their original drainage patterns in Canaan Valley. This results in some drainages receiving less water and therefore becoming drier, while others are forced to carry more water resulting in accelerated erosion and increased water levels. Routine maintenance to redirect water and repair existing erosion is required to sustain horseback riding routes (Rizzo 2002, Zeedyk 2002).

Zeedyk (2002) documented many instances in Canaan Valley where existing roads and trails were channeling water away from historical wetlands and in some cases causing erosion and sedimentation of bog and other wetland communities. These problems have profoundly if not irreversibly altered the extent, depths, characteristics and function of the wetlands on the Main Tract (Zeedyk 2002). The effects of these trails and roads were a direct result of vehicle use and road construction prior to the refuge's acquisition of the property. Since then measures have been taken to remediate erosion and sedimentation issues, particularly on trails that are open to public access. Furthermore, since the refuge has now acquired lands within the acquisition boundary, it can prohibit vehicle use and road construction in certain areas so as to minimize these types of impacts.

The refuge minimizes adverse effects on water resources in a variety of ways. Refuge staff routinely monitors roads and trails for damage and remediate problem areas as needed. Trail maintenance is conducted to help minimize any negative effects associated with trail use. Refuge staff ensures any potential negative effects are avoided or minimized.

The refuge also conducts public outreach efforts to notify visitors of proper precautions, including carrying out all trash. This helps minimize risks associated with visitor use on the refuge.

It is anticipated that horseback riding could alter drainage features of roads and trails through erosion and compaction, potentially affecting water quality and hydrology. These problems will be minimized because routes designated for this use are primarily existing logging and skid roads, and most have hardened surfaces or already compacted soils. These routes are located predominately on upland soils to prevent impacts to fragile wetland soils. Any new trails proposed for public use with horses will be evaluated similarly and permitted only when they meet the trail checklist criteria. New trail development and use will be evaluated in subsequent EAs as appropriate to evaluate the potential impacts and possible alternatives of this use.

Based on the current and projected levels of use, condition of designated routes, and minimization measures employed, adverse effects on water resources because of this use are expected to be minimal.

Effects on Vegetation: Horse travel can impact plants on roads and trails by crushing them. Indirectly, horses can impact plants by compacting soils, thereby diminishing soil porosity, aeration and nutrient availability (Kuss 1986). Hammitt and Cole (1998) note compaction limits the ability of plants to revegetate affected areas. Plants growing in wet or moist soils are the most sensitive to disturbance from trampling effects (Kuss 1986). Horseback riding has caused braided roads and trails in excessively muddy trail sections (Summer 1986). Weaver and Dale (1978) found horse use caused a greater loss of vegetation cover, wider and deeper roads and trails, and greater soil compaction when compared to hiker use on meadow and forest trail conditions. Moist and wet soil conditions are common in Canaan Valley, particularly during spring and early summer, and can occur on upland roads and trails that have been incised and are channeling water.

It is anticipated that horses will have some impacts on refuge plant communities growing on the designated travel routes. Designated routes for horseback riding consist of former logging roads with hardened surfaces or are existing trails that have been used for many years. These routes are located predominately on upland soils to prevent impacts to fragile wetland soils and associated plant communities. Designated routes do not have any known occurrences of rare plant species on their surface that would be affected by this use. Some rare plants have been documented in habitat adjacent to trails; however, rare plant species have not been found on the designated route surfaces themselves, and several routes contain exotic grasses and forbs planted during logging operations prior to refuge acquisition.

Horse use may cause local impacts to plants and soils when horses are confined. Spencer (2002) observed that tying horses to trees damaged plants and soils. Confined horses in Canaan Valley ate the bark of nearby trees. This occurred at upland camps where horses were left for extended periods (Spencer 2002). According to Cole (1983), bark damage from tethering horses to trees can result in insect invasions and girdling that can ultimately kill the tree. Soil compaction and erosion at these sites was also cited as a problem, especially where it exposed tree roots (Cole 1983). Horses may also browse native plants if tethered for extended periods. Typically horses are confined to areas where camping is permitted. Since camping is prohibited on the refuge, long term confinement and subsequent impacts are minimized. Further, refuge stipulations to ensure compatibility prohibit tethering horses to trees or other vegetation to prevent damage to vegetation.

Invasive plant species may be transported into the refuge through the presence of exotic plant seeds in feed hay. This concern has initiated strict requirements for weed-free hay in some natural areas. At Yellowstone National Park (WY, MT, ID), and Green Mountain and Fingerlakes National Forests (NY) only processed feed (pelletized or cubed hay) or certified "weed seed-free" hay is allowed in the back-country (Zimmer 2001, Oliff 2002). Currently, there are no programs to provide or certify weed-free hay in West Virginia or in the surrounding vicinity (Rayburn 2001, 2009). According to the West Virginia Agricultural Extension office, two plants that could be easily transported in hay, via seed, are tall fescue *(Festuca arundinacea)* and reed canary grass *(Phalaris arundinacea)* (Rayburn 2001, 2009). The presence of reed canary grass has been documented on the refuge's wet meadows and fields. However, hay cut later in the season is typically vegetative and seed free (Rayburn 2009).

Wells and Lauenroth (2007) found that horses have the potential to disperse a large number of seeds from a variety of plant types. Because horses take an average of 3 to 4 days, and up to 10 days, to eliminate the seeds they ingest, they represent an important vector for long distance seed dispersal from where the horses are kept to wildlands.

The refuge anticipates that there will be minimal adverse impacts to plant communities on designated routes. Most routes designated for horse use are highly modified vehicle access roads and old logging roads where common grass and sedge species were planted for erosion control or where plant communities are nonexistent on roadbeds consisting of hard-packed graded surfaces. As weed seed-free hay is not available in West Virginia, horses could introduce invasive plant species to the trails and adjacent habitats on the refuge. While no rare plant species or communities are known to exist on the trails, some rare plants have been documented adjacent to trails designated for pedestrian use. Users leaving designated trails could have impacts to adjacent vegetation. Where impacts to vegetation are observed, the refuge will take necessary measures, such as remediation and trail closures, to restore plant communities on or adjacent to the affected trail.

Exposed soil and an abundance of sunlight along roads and trails provide ideal conditions for the establishment of invasive plant species. Invasions result from the use of foreign material to construct and maintain roads and trails, and from transport via visitors and vehicles traveling on roads and trails. Stout (1992) found that roads and trails created through emergent wetlands were being colonized by barnyard grass *(Echinochloa crusgalli)*, which displaces native plants, and is a species on the State list of invasive exotic plants. Designated routes include old logging roads that previously have been planted with exotic cover species following logging operations.

Horseback riding may create bare soil conditions conducive for invasive species growth. Invasive plants, if allowed to establish and spread, can cause major damage to native plant assemblages and the wildlife they support. We will take steps to ensure that invasive species are not introduced or spread. We will monitor for invasive species and control or eliminate them where they occur. Key among these invasive plants species are reed canary grass *(Phalaris arundinacea)*, multiflora rose *(Rosa multifora)*, yellow flag iris *(Iris pseudacorus)*, Japanese stilt grass *(Microstegium vimineum)*, garlic mustard *(Alliaria petiolata)*, and cattails. We will take proper care in cleaning and maintaining all refuge equipment (e.g., used for trail maintenance) to avoid introduction or transport of invasive plants, we will implement visitor outreach and education programs, and we will actively support State and partner initiatives and continue to work with the State to prevent introduction of invasive species to all habitats on the refuge.

It is anticipated that horse use will cause minimal increases in invasive plants relative to the current vegetative community on designated routes. Typical hay from local sources contains plants listed as noxious weeds by the Mid-Atlantic Exotic Pest Plant Council including orchard grass, velvet grass, yellow sweet clover, timothy and others. Additionally, refuge grasslands contain many of the same species utilized as hay forage for horses, since refuge grasslands were acquired directly from farmers growing hay or pasturing cattle. Therefore the increased risk of spread of invasive species through horse use that is confined to specific hardened trails is not expected to greatly increase the risk of invasive species spread and establishment.

The refuge minimizes adverse effects on vegetation in a variety of ways. Refuge staff routinely monitors roads and trails for damage and remediates problem areas as needed. Trails are monitored for invasive species during the growing season and invasive plants are treated mechanically or with herbicides. Trail maintenance is conducted to help minimize any negative effects associated with trail use. If evidence of unacceptable adverse impacts appears, we will reroute, curtail, or close trails to this use as deemed appropriate. Based on the conditions of routes and minimization measures employed, negative effects on vegetation because of this use are expected to be minimal.

Effects on Soils: Horses can cause physical impacts to soil surfaces. Horses may cause trail erosion by loosening the soil and increasing soil particle detachment under both wet and dry trail conditions (Deluca et al. 1998). Horses can also increase soil compaction (Weaver and Dale 1978). The Mauch Chunk-derived soil in Canaan Valley is particularly vulnerable to mechanical erosion when vegetation has been removed (Rizzo 2002). If compacted, Mauch Chunk soils can facilitate rapid water runoff that accelerates erosion down slope (Rizzo 2002).

While horse use will increase the impacts to soils through compaction and erosion, the refuge has attempted to minimize those impacts by only allowing horseback riding on roads open for vehicle use and trails modified through grading and proper drainage, located predominantly on upland soils. Routes designated for horseback riding were selected based on soil conditions that were listed as low risk for compaction and erosion as well as an in-field evaluation of existing conditions (Bell 2002, Rizzo 2002). Most of the designated routes are pre-existing roads that have been previously altered by vehicles and logging equipment, therefore soils are generally compacted and less susceptible to additional physical impact and mechanical erosion. There are trail sections where Mauch Chunk-derived soils, which have high erosion and compaction potentials, have been exposed through activities that occurred prior to refuge acquisition. Future trail development will allow horse use only if those trails meet refuge trail criteria to prevent degradation.

We will take all reasonable measures to prevent or minimize any negative effects. We will evaluate the roads and trails periodically to assess whether they meet established suitability criteria and to prevent degradation. If evidence of unacceptable adverse impacts appears, we will re-route, curtail, or close trails to this use as deemed appropriate. We will post and enforce refuge regulations, and establish, post, and enforce closed areas. Based on the information provided above and the current and projected levels of use, the refuge anticipates that there will be minimal adverse impacts to soils associated with horse use.

Effects on Wildlife: Disturbances vary with the wildlife species involved and the type, level, frequency, duration, and the time of year such activities occur. The responses of wildlife to human activities include avoidance or departure from the site (Owen 1973, Burger 1981, Kaiser and Fritzell 1984, Korschen et al. 1985, Henson and Grant 1991, Kahl 1991, Klein 1993, Whittaker and Knight 1998), the use of sub-optimal habitat (Erwin 1980, Williams and Forbes 1980), altered behavior or habituation (Burger 1981, Korschen et al. 1985, Morton et al. 1989, Ward and Stehn 1989, Havera et al. 1992, Klein 1993, Whittaker and Knight 1998), attraction (Whittaker and Knight 1998), and an increase in energy expenditure (Morton et al. 1989, Belanger and Bedard 1990). Mammals may become habituated to humans, making them easier targets for hunters. Disturbance can have other effects including causing shifts in habitat use, abandonment of habitat, and increased energy demands on affected wildlife (Knight and Cole 1991).

The effects of roads and trails on plants and animals are complex and not limited to trail width. Trail use can disturb areas outside the immediate trail corridor (Trails and Wildlife Task Force 1998, Miller et al. 2001). Taylor and Knight (2003) describe a 100-meter zone of disturbance for mammals adjacent to trail corridors. Miller et al. (1998) describe a 75-meter zone of influence where bird abundance and nesting activities (including nest success) were found to increase as distance from a recreational trail increased in both grassland and forested habitats. Bird communities in this study were apparently affected by the presence of recreational roads and trails, where common species (e.g., American robins) were found near trails and rare species (e.g., grasshopper sparrows) were found farther from trails. Songbird nest failure was also greater near trails (Miller et al. 1998).

Several studies have examined the effects of recreationists on birds using shallow-water habitats adjacent to trails and roads through wildlife refuges and coastal habitats in the eastern United States (Burger 1981, Burger 1986, Klein 1993, Burger et al. 1995, Klein et al. 1995, Rodgers and Smith 1995, Rodgers and Smith 1997, Burger and Gochfeld 1998).Overall, the existing research clearly demonstrates that disturbances from recreation activities have at least temporary effects on the behavior and movement of birds within a habitat or localized area (Burger 1981, Burger 1986, Klein 1993, Burger et al. 1995, Klein et al. 1995, Rodgers and Smith 1997, Burger and Gochfeld 1998). The findings that were reported in these studies are summarized as follows in terms of visitor activity and avian response to disturbance.

Presence: Birds avoided places where people were present and when visitor activity was high (Burger, 1981; Klein et al., 1995; Burger and Gochfeld, 1998). Batten (1977) and Burger (1981) found that wading birds were extremely sensitive to disturbance in the northeastern United States. Klein (1993) found that, as the intensity of human disturbance increased, avoidance response by water birds increased. Conflicts arise when migratory birds and humans are present in the same areas (Boyle and Samson, 1985). McNeil et al. (1992) found that many waterfowl species avoid disturbance by feeding at night instead of during the day. Studying the effects of human visitation on water birds at the J.N. "Ding" Darling National Wildlife Refuge, Klein (1989) found resident water birds to be less sensitive to disturbance than migrants were. Klein also found that sensitivity varied according to species and individuals within species. Ardeids (herons and cranes) were quite tolerant of people but were disturbed as they took terrestrial prey; great blue herons, tricolored herons, great egrets, and little blue herons were observed to be disturbed to the point of flight more than other birds. Kushlan (1978) found that the need of these birds to move frequently while feeding might disrupt interspecific and intraspecific relationships. Gutzwiller et al. (1994) found that singing behavior of some songbird species was altered by low levels of human intrusion. Some bird species habituate to repeated intrusion; frequently disturbed individuals of some species have been found to vocalize more aggressively, have higher body masses, or tend to remain in place longer (Cairns and McLaren 1980).

Distance: Disturbance increased with decreased distance between visitors and birds (Burger, 1986), though exact measurements were not reported.

Reproduction and nesting success: Disturbance may affect the reproductive fitness of males by hampering territory defense, male attraction and other reproductive functions of song (Arrese 1987). Disturbance, which leads to reduced singing activity, makes males rely more heavily on physical deterrents in defending territories, which are time and energy consuming (Ewald and Carpenter 1978). Flight in response to disturbance can lower nesting productivity and cause disease and death (Knight and Cole 1991). Miller et al. (1998) found bird abundance and nesting activities (including nest success) increased as distance from a recreational trail increased in both grassland and forested habitats. Bird communities in this study were apparently affected by the presence of recreational trails, where common species (i.e., American robins) were found near trails and more specialized species (i.e., grasshopper sparrows) were found farther from trails. Nest predation also was found to be greater near trails (Miller et al. 1998).

Noise: Noise caused by visitors resulted in increased levels of disturbance (Burger 1986, Klein 1993, Burger and Gochfeld 1998), though noise was not correlated with visitor group size (Burger and Gochfeld, 1998).

Knight and Cole (1991) suggest recreational activities occurring simultaneously may have combined negative impacts on wildlife. Hammitt and Cole (1998) conclude that the frequent presence of humans in 'wildland' areas can dramatically change the normal behavior of wildlife mostly through 'unintentional harassment.'

Seasonal sensitivities can compound the effect of disturbance on wildlife. Examples include regularly flushing birds during nesting or causing mammals to flee during winter months, thereby consuming large amounts of stored fat reserves. Hammitt and Cole (1998) note that females with young (such as white-tailed deer) are more likely to flee from a disturbance than those without young. Some uses, such as bird observation, are directly focused on viewing certain wildlife species and can cause more significant impacts during breeding season and winter months.

Impacts to wildlife may be indirectly caused by erosion and subsequent sedimentation of streams and vernal pools as a result of poorly designed trails and travel over bare soils and around drainages. Increased sediment loads can reduce aquatic vegetation and dissolved oxygen concentrations (Sadoway 1981). Sedimentation can directly kill aquatic invertebrates, affecting the success of amphibian larvae and adults (Sadoway 1981). Observations by refuge staff in 2002 document numerous occurrences of amphibian egg masses that failed after becoming coated in sediment from eroding trails and roads nearby. Bartgis and Berdine (1991) report that sedimentation was damaging habitat in Canaan Valley and could cause impacts to the rare plants, water quality and possibly affect habitat of the southern water shrew (*Sorex palustris punctulatus*), a State species of concern. This was a direct result of vehicle use and road construction prior to the refuge's acquisition of the property. Trail work conducted since 2002 has begun to address sedimentation and erosion issues on refuge trails. Because trails designated for horseback riding are upland areas or locations of existing (compacted) logging roads, the use of horses is not expected to significantly increase erosion or sedimentation problems. Through proper trail maintenance and construction, trail drainage will be improved to minimize the effects of erosion and sedimentation on wildlife.

Short-term, localized adverse impacts to fish populations also may result from soil erosion and sedimentation into refuge waterways associated with this activity. Long-term adverse impacts from increased trail miles and trail use might pose another concern to refuge fisheries. Trails that have stream and river crossings would likely degrade over time with increased use and contribute to downstream sedimentation and turbidity, which has been found to be a stressor to brook trout (Sweka and Hartman 2001) and redside dace (Holm and Crossman 1986) populations that are sensitive to habitat degradation. Currently there are four stream crossings which are open to horse use. Two crossings have been hardened to resist the erosive effect of horse hooves. The refuge has constructed bridges for the other two crossings to allow horses to cross without impacting soils. The majority of horse use trails occur on upland soils and on old logging roads which have been compacted over years of use prior to refuge acquisition. The refuge will monitor stream and river crossings closely and remediate any damaged areas to minimize adverse impacts associated with trail use.

Anticipated impacts of horseback riding on wildlife include temporary disturbances to species using habitat on the trail or directly adjacent to the trail. These disturbances are likely to be short term and infrequent as much of the use is concentrated during weekends in the summer and fall. Use of some roads and trails may cause direct impacts such as mortality (e.g., crushing amphibians foraging on grassy roads and trails) to nest abandonment of bird species nesting on trails. Long-term impacts may include certain wildlife species avoiding trail corridors as a result of this use over time.

Routes found compatible for horseback riding are located primarily in continuous tracts of northern hardwood forest on the refuge. Smaller, more sensitive wildlife habitat such as riparian, wetland, and grassland areas were avoided which reduces the potential for wildlife disturbance. Locating these trails in upland forested habitat spreads the disturbance over the largest habitat type on the refuge, thereby diluting the overall impact on refuge wildlife associated with this habitat.

Horseback trails are not located in areas where habitats are more sensitive and under represented. This helps to prevent disproportionate disturbance to wildlife in these areas. To minimize adverse impacts of any future trails that are open to horseback riding, the refuge will use its trail/route checklist to determine whether the existing or new trail meets established criteria, and it will monitor effects associated with these new trails in the same manner that established trails are monitored. Any new trails that are open to horseback riding and that are not mentioned in the CCP will likely have to undergo additional National Environmental Policy Act analysis.

West Virginia northern flying squirrels have been documented on refuge property near the end of FR 80. This species has recently been removed from the endangered species list. The recovery plan (USFWS 2001) notes that habitat modification may create a competitive advantage for the southern flying squirrel *(Glaucomys volans)*, although the extent to which a logging road or trail would create conditions conducive for this are unknown. Some research has found northern flying squirrels occupying den sites near logging roads, skid trails, and on hiking trails (Ford 2002). Routes designated for these uses are pre-existing roads and trails some of which have been in existence for many years. No new habitat clearing is planned in this area; however, some vegetation clearing may be required to maintain the trail corridor. As mentioned previously, we will periodically evaluate these activities to determine any effects they may have. If evidence of unacceptable adverse impacts appears, the location(s) of activities will be curtailed or discontinued as needed.

Based on the information provided above and the current and projected levels of use, allowing this use is not anticipated to significantly increase wildlife habitat fragmentation or cause significant impacts on wildlife through disturbance. Nearly all of the designated roads and trails have been consistently used for horseback riding for at least 20 years.

Effects on Threatened and Endangered Species: There are two Federally listed species known to occur on the refuge, and one species that has recently been de-listed. Cheat Mountain salamanders (*Plethodon nettingi*), listed as threatened, have been documented at a distance from the top of FR 80, and near the cross-country ski trails in that area. Indiana bats (*Myotis sodalis*), listed as endangered, are known to use the refuge's forested areas for summer foraging and may have a summer maternity colony on refuge lands as well. The West Virginia northern flying squirrel (*Glaucomys sabrinus fuscus*) has been documented on refuge property near the end of FR 80. This species has recently been removed from the endangered species list. The refuge requested Section 7 informal consultation with the Service's West Virginia Field Office under the Endangered Species Act (16 U.S.C. 1536) on all the actions in this CCP, including horseback riding, that could potentially impact listed species. This process resulted in a finding that the proposed actions are not likely to adversely affect the listed species or their associated habitats on the refuge. The full intra-Service Section 7 Biological Evaluation form can be found in appendix H of this CCP.

Cheat Mountain salamander—This species is sensitive to any habitat changes that remove a forest canopy or reduce soil moisture and relative humidity. Because Cheat Mountain salamanders have very specific ranges of tolerance for temperature and relative humidity, any activity which increases soil temperature and lowers relative humidity near the ground surface can have detrimental effects on salamander populations (USFWS 1991). According to the Service (USFWS 1991), trails that receive heavy use resulting in bare trail treads could limit movements of Cheat Mountain salamanders and interfere with reproduction.

Cheat Mountain salamanders become more sensitive during warmer seasons. Temperatures greater than 55° F are considered to be when activity increases for the salamander, and this temperature is the low end of the recommended temperature range in which salamander surveys should be conducted (USFWS 1991). Therefore, ground disturbance which is limited to those times of the year when temperatures are below 55° F is not likely to cause direct impacts to salamander populations. Horse use occurs primarily during summer and fall when this species is active. However, horseback riding is not permitted on any refuge trails that are located within Cheat Mountain salamander habitat.

Horseback riding is permitted on FR 80. The nearest known Cheat Mountain salamander habitat to FR 80 is 754 feet from the road (USFWS 2008), far more than the 300-foot buffer zone recommended in the recovery plan for this species (USFWS 1991). Therefore, the road and any uses on the road are not likely to adversely affect this species. We are not proposing any activities or land use in Cheat Mountain salamander habitat, so no adverse impacts are expected with this use.

Indiana Bat—Indiana bats were documented on the refuge for the first time through acoustical monitoring conducted by the U.S. Forest Service in 2003 (Ford 2003). Indiana bats were found foraging at two locations in the south end of the refuge. The refuge began conducting acoustical surveys in 2005. These surveys have documented three likely Indiana bat observations in the same location as the 2003 survey during 2005, 2007, and 2008. Additionally, acoustical surveys documented one new location for the species during 2007. Indiana bat calls have been documented from the refuge in the months of May, July, August, and September. However, since the use is restricted to day time hours disturbance of foraging bats is unlikely. The refuge will be investigating Indiana bat use in greater detail. If habitats used by this species, particularly any identified roost sites, are near trails used by horseback riders, the use will be reevaluated for its impact. The refuge will consult with the Service's West Virginia Field Office when any new information is gathered on the presence of Indiana bats or

use of refuge habitats to ensure that horseback use will not affect the species. We will periodically evaluate this activity to determine any effects it may have. If evidence of unacceptable adverse impacts appears, horseback riding will be curtailed or discontinued as needed.

Horseback riding along designated routes is not likely to adversely affect threatened or endangered species. This use will occur primarily on existing roads and trails and on any trails that are newly designated for horseback riding through the CCP. Cheat Mountain salamander habitat occurs at a distance from FR 80, so there is enough distance between the habitat and the road so that the species is not likely to be adversely affected by the road or any activities on the road.

Horseback riding on the roads and trails designated are not expected, separately or cumulatively, to constitute major short-term or long-term impacts. Assessment of potential future impacts was based on available information and current and anticipated level and pattern of use collected from surveys conducted by refuge staff in 2002-2003 and informal field observations since then. The current use is viewed as a manageable and acceptable method of travel that allows the public to discover, experience, and enjoy priority public uses on the refuge. Continued monitoring of the effects of horseback riding and associated human activities is necessary to better understand the influence of the use on refuge habitats, plant and wildlife communities, and visitors. Monitoring identifies any actions needed to respond to new information (adaptive management) and correct problems that may arise in the future.

PUBLIC REVIEW AND COMMENT

This compatibility determination was released concurrent with the draft Comprehensive Conservation Plan/ Environmental Assessment for a 45-day public review and comment period.

DETERMINATION (CHECK ONE BELOW):

_____ Use is not compatible

__**X**__ Use is compatible with the following stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

The refuge has also developed a list of criteria for determining whether any given route would be appropriate for public uses, including horseback riding. These criteria apply to current and future trails. Criteria are as follows:

Checklist for Existing Routes to Be Eligible for Compatibility Consideration
(Routes must meet all criteria)

1. Route provides an opportunity to view a variety of habitats and wildlife.

2. Route is safe for the access proposed at current use levels.

3. Route requires minimal annual maintenance (i.e, waterbars, stepping stones, etc.) to ensure safe access and to prevent further habitat degradation.

4. Route has a low potential for fragmenting habitat or disturbing wildlife populations.

5. Based on existing soils information, less than 50 percent of the route's length occupies soil types rated as high or very high for compaction and/or erosiveness. The route is not rated as severely limited for hiking trails based on the Tucker County Soil Survey.

6. Any route crossing of sensitive soils occupies the shortest possible distance. Organic soil crossings are minimized or eliminated.

7. Continued use of the existing route is not likely to cause further wetland alteration or degradation. There is low risk that hydrology, soil stability, sensitive plant communities, riparian zones, and wildlife habitats would be adversely affected.

8. Route predominately occupies modified substrate (graveled, compacted, or filled) like logging roads and rail grades.

9. Route is not incised greater than 1 foot deep over 10 percent of its total length.

Additional Stipulations for Horseback Use:

— Refuge regulations will be posted and enforced. Closed areas will be established as needed, posted, and enforced. Signs necessary for visitor information, safety, and traffic control will be kept up to date.

— Free-trailing or loose-herding of horses on trails is prohibited.

— Allowing horses to proceed in excess of a slow walk when passing in the immediate vicinity of persons on foot or bicycle is prohibited. Horses are not permitted to travel at any time faster than normal walking gait.

— All trail users should avoid obstructing a trail or making a loud noise or sudden motion while horses or pack animals are passing.

— The known presence of a threatened or endangered species will preclude the use of an area until the refuge manager determines otherwise.

— Camping and overnight parking are currently prohibited. Overnight parking may be authorized by special use permit at the end of FR 80 to facilitate visitor access to non-refuge lands.

— The refuge conducts an outreach program to promote public awareness and compliance with public use regulations on the refuge.

— Horseback rider group size is encouraged to be no more than 10 persons to promote public safety, reduce conflict with other users, promote a quality experience, and reduce wildlife disturbance. Groups larger than 10 persons must contact the refuge office prior to visiting the trail system so the refuge can determine if a special use permit is needed.

— All routes designated for public access are annually inspected for maintenance needs. Prompt action is taken to correct any conditions that risk public safety. Roads and trails are maintained at a level that reasonably accounts for safe travel. Roads are not plowed in winter.

— Routes designated for public access are monitored periodically to determine if they continue to meet the compatibility criteria established by the refuge. Should monitoring and evaluation of the use(s) indicate that the compatibility criteria are or will be compromised, appropriate action will be taken to ensure continued compatibility, including modifying or discontinuing the use.

— Routine law enforcement patrols are conducted throughout the year. The patrols promote education and compliance with refuge regulations, monitor public use patterns and public safety, and document visitor interaction.

— Potential conflicts with other public uses such as hunting, interpretation, etc. will be minimized by using trailhead signs and other media to inform the visitors about current public use activities as well as which activities are authorized in specific locations throughout the refuge.

— This use may be restricted during the late-fall and winter when the refuge has priority, wildlife-dependent activities (like deer hunting) in progress. This helps ensure public safety and minimize user conflicts.

JUSTIFICATION

The Service and the Refuge System have established priority uses for the public to observe wildlife and habitats at refuges. Horseback riding provides additional opportunities for viewing wildlife and habitats with relatively low levels of disturbance, facilitating many of the priority public uses. It is likely that visitors participating in this activity will learn more about the area's wildlife and habitats, the refuge, and the Refuge System. This may lead to increased awareness of and support for each of these.

Routes designated for horseback riding are pre-existing roads and trails, most of which have been in existence for many years. Nearly all of the designated roads and trails have been consistently used for horseback riding for at least 20 years. Confining horse use to only those routes evaluated, maintained and approved for this activity restricts this use more than what was previously permitted by the original landowner. Most of the designated routes are pre-existing roads or trails that have been previously altered by vehicles and logging equipment, therefore soils are generally compacted and less susceptible to additional physical impact and mechanical erosion. These conditions directly limit the physical impact of this activity to soils, hydrology, and vegetation. In addition, these routes are located predominately on upland soils to prevent impacts to fragile wetland soils.

Trail conditions have improved since refuge acquisition of the Main Tract in 2002 due to restoration and maintenance actions. Additionally, vehicles were prohibited from accessing these areas after the refuge acquired the property which greatly reduced impacts. The use of horses on existing designated public use trails will not significantly increase resource impacts over and above the other, existing public uses. Because of the restrictions and management of the trail system, the impact to soils and possible sedimentation of wetland resources will be minimized. Therefore these anticipated impacts will not affect the refuge's ability to fulfill the purposes of wetland conservation established through the Emergency Wetland Resources Act (1986).Because trail width is narrow and trails are on established logging roads, impacts to plants will be minor and therefore not affect the refuge's ability to conserve plant resources as described in the mission of the Refuge System and to protect the ecological integrity of Canaan Valley and its resources, a founding purpose for designation of the refuge in the 1979 EIS.

No horse trails are located in areas occupied by the threatened Cheat Mountain salamander. The endangered Indiana bat forages in the evening when horseback riding is not permitted. There are no identified Indiana bat hibernacula, roosting or maternity colonies on refuge land, however, if any are discovered in the future, the refuge would consult with the Service's Ecological Services Office to ensure that no adverse impacts will occur.

Trails used by horses are generally long (4 miles or greater in round trip distance) and the use of horses on these routes increases the public's ability to experience the refuge by facilitating access over longer trail segments. Anticipated impacts of horseback riding on wildlife include temporary disturbances to species using habitat on the trail or directly adjacent to the trail. These disturbances are likely to be short term and infrequent based on seasonality of use, expected timing of use (i.e. concentrated on weekends) and locations where the use is permitted to occur. Horse routes occur primarily in forested habitats to help reduce disturbance to wildlife. Disturbance along trail corridors will impact only a fraction of the habitat available for wildlife on the refuge, and this disturbance will occur within the most abundant habitat type on the refuge. By limiting use to designated trails on a small percentage of the refuge and within the most common habitat type, disturbance will be limited and manageable. For this reason, disturbance effects will not prevent the refuge from fulfilling the establishing purposes of the Fish and Wildlife Act (1956) or the mission of the Refuge System for conserving, managing, restoring, and protecting wildlife resources. This use will not affect the refuge's ability to fulfill its purpose under the Migratory Bird Conservation Act to serve as a sanctuary or management area for migratory birds, as this use will not occur on the tracts that were acquired under that act.

The risk of invasive species introduction is considered low and manageable. Horse use is only permitted on trails with previously compacted surfaces which are less likely to erode and create new opportunities for plant establishment. Additionally, horse feed is typically from local sources which include the same exotic grass species which exist in the refuge's managed grasslands. Most of these species are considered exotic but not invasive and can be controlled through regular inventory and management procedures.

We will post and enforce refuge regulations, and establish, post, and enforce closed areas as needed. We also evaluate the roads and trails periodically to assess whether they meet established suitability criteria and to prevent degradation. If evidence of unacceptable adverse impacts appears, we will repair the trail through scheduled maintenance programs, or re-route, curtail, or close trails to horseback riding as deemed appropriate.

Conflicts between horseback riders and other users are localized and limited in time and space. Many refuge trails are closed to horse access to prevent user conflicts and to reduce the overall impact on the priority public uses. Given the size of the refuge and the miles of trail open for the various forms of public access, conflicts are expected to be minor.

Because of the limitations established for this activity, disturbance from horseback riding is not expected to greatly increase the disturbance to wildlife or habitat on the refuge relative to other permitted priority public use activities. Providing increased access to remote sections of refuge lands increases the public's ability to learn about the refuge's role in protecting the wetlands of Canaan Valley and managing and protecting wildlife species and habitat. For the reasons discussed above, this access will not affect the refuge's ability to conserve wetlands or protect, manage, and restore the wildlife and plant resources, as mandated through the Emergency Wetlands Resources Act (1986) and the Fish and Wildlife Act (1956), or the mission of the Refuge System. Since public use trails do not occur on lands acquired under the Migratory Bird Conservation Act, horseback riding will not affect the refuge's ability to protect and manage migratory birds on those tracts. We therefore conclude horseback riding will not materially interfere with or detract from the mission of the Refuge System or the purposes for which the refuge was established.

SIGNATURE:

Refuge Manager: Kenneth K. Foster /Acting (Signature) 2/14/2011 (Date)

CONCURRENCE:

Regional Chief: Anthony D Léger (Signature) 02/25/2011 (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: 02/25/2021

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COMPATIBILITY DETERMINATION

USE

Vehicular Travel to Facilitate Priority Public Uses

REFUGE NAME

Canaan Valley National Fish and Wildlife Refuge

DATE ESTABLISHED

August 11, 1994

ESTABLISHING AND ACQUISITION AUTHORITY

The establishment of Canaan Valley National Wildlife Refuge (refuge) was first approved in an Environmental Impact Statement (EIS) released on May 30, 1979. However, the U.S. Fish and Wildlife Service (Service) decided to await the outcome of litigation surrounding a proposed storage hydroelectric facility before pursuing any further action. The approval of the refuge was affirmed by the Service in a 1994 Final Environmental Assessment and Finding of No Significant Impact on July 11, 1994, which confirmed the adequacy of the previously approved 1979 EIS. The refuge was officially established when the first tract of land was acquired on August 11, 1994. The Service has acquired lands for the Canaan Valley refuge under the following authorities:

1. Fish and Wildlife Act of 1956 [16 U.S.C. 742f(a)(4)]
2. Emergency Wetlands Resources Act of 1986 [16 U.S.C. 3901b]
3. Migratory Bird Conservation Act of 1929 [16 U.S.C. 715d]

REFUGE PURPOSES

The refuge was established to ensure the ecological integrity of Canaan Valley and the continued availability of its wetland, botanical, and wildlife resources to the citizens of West Virginia and the United States (USFWS 1979, 1994). Additional refuge purposes as derived from the legislative authorities are as follows:

(1) "... for the development, advancement, management, conservation, and protection of fish and wildlife resources..." (Fish and Wildlife Act of 1956; 16 U.S.C. 742f (a)(4));

(2) "... for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions." (Emergency Wetlands Resources Act of 1986; 16 U.S.C. 3901(b)); and,

(3) "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (Migratory Bird Conservation Act of 1929; 16 U.S.C. 715d).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans. National Wildlife Refuge System Improvement Act, 16 U.S.C § 668dd (a)(2).

DESCRIPTION OF PROPOSED USE

(a) What is the use? Is the use a priority public use?
The use is vehicular access to facilitate priority public uses on the refuge, such as hunting, fishing, wildlife observation and photography, environmental education, and interpretation 9 16 U.S.C. § 668 ee(2); 50 CFR. § 25.12). These uses are described as the priority public uses of the refuge system [16 U.S.C 668dd(a)(3)(c). For the purpose of this determination, "vehicles" mean legally licensed cars, trucks, and motorcycles. This term does not include recreational all-terrain vehicles and snowmobiles, which are prohibited on the refuge. The operation of a vehicle which does not bear valid license plates and is not properly registered and inspected in accordance with applicable State laws is prohibited. Vehicle use is not a priority public use but is necessary to facilitate refuge priority public uses.

(b) Where would the use be conducted?
Since the establishment of the refuge in 1994, the public has been allowed to operate vehicles on two roads. Forest Road (FR) 80 is 1.91 miles and provides vehicular access from Route 32 to U.S. Forest Service lands, including the Dolly Sods Wilderness Area. A-frame Road (4.79 miles on refuge) provides vehicular access to the northern portion of the refuge (Main Tract). This road is accessed from Highway 93. Vehicle travel is allowed on these two maintained roads to points where they are closed to protect refuge resources.

Refuge roads traverse spruce-fir, mixed conifer/hardwood and northern hardwood forest habitats. Wildlife species occurring in the vicinity of roads include various migratory birds, turkey, white-tailed deer, ruffed grouse, various furbearers, reptiles, and amphibians. The threatened Cheat Mountain salamander (*Plethodon nettingi*) has been found within the forest that is traversed by FR 80. Refuge inventories have not found this species in the vicinity of the road, but a population is located greater than 300 feet from the road, a distance greater than the recommended buffer for salamander habitat protection (USFWS 1991). The recently de-listed West Virginia northern flying squirrel (*Glaucomys sabrinus fuscus*) has been documented on refuge property near the end of FR 80.

Many unique and rare plant species occur, or are likely to occur, on the refuge. At least 26 species of plants found in Canaan Valley have been documented five times or less in the State of West Virginia. Also, 73 plants that are tracked by the West Virginia Division of Natural Resources (WVDNR) as State species of concern have documented occurrences in Canaan Valley. Inventories have shown that some rare plants do grow near or directly adjacent to existing roads and trails.

(c) When would the use be conducted?
Designated roads are open year-round to vehicular access. An average of 120 inches of snow falls annually in Canaan Valley. No snow removal is conducted; therefore, many refuge roads become inaccessible to vehicles during heavy snowfall. Daily use hours are between one hour before sunrise and one hour after sunset when the refuge is open to the public. The general pattern of vehicle travel shows visitation is higher on weekends than weekdays. Most vehicular access occurs during the peak of fall colors starting in mid-September through the deer bucks-only rifle season (beginning the Monday prior to Thanksgiving and continuing for two consecutive weeks). Travel at night for raccoon hunting on the refuge requires a special use permit. Wildlife observation and photography occur year-round but observation of returning neo-tropical migrant birds peaks in May and June. Opportunities exist year-round for environmental education and interpretation.

(d) How would the use be conducted?
Vehicular access on the refuge is conducted according to applicable provisions of 50 Code of Federal Regulations 27.31 ("General Provisions Regarding Vehicles") and West Virginia State law. To promote safe vehicle operation,

to reduce the risk of vehicular collisions with other users and wildlife, and to enhance opportunities for wildlife observation, vehicle travel is subject to a maximum speed of 25 miles per hour. The roadway will be shared with other users. Vehicles must be properly licensed and registered, properly equipped, and legal for street travel by West Virginia law. Parking is available along refuge road shoulders on A-frame road, in turnouts, and at designated refuge parking lots. At the current level of use, these facilities are adequate to handle parking in an efficient and safe manner.

Vehicular use on the refuge has not been thoroughly documented. Assessments of current conditions and use were made through observations by refuge staff and discussions with hunters and WVDNR Conservation Officers. The level of vehicle use on refuge property was monitored by refuge staff in 2002 and 2003. Out of 44 monitoring days (mostly weekends) between September 2002 and July 2003, a total of 212 vehicles have been documented in refuge parking areas. This number excludes the deer rifle hunting season, which would likely triple the number of total vehicles (based on number of hunters on refuge property) for the monitoring period. Vehicle use is heaviest on south end parking lots during most of the year. During deer season vehicle use to access the refuge increases considerably on A Frame road.

Traffic counters have been installed at FR 80, A-frame Road, and near the Beall Tract parking lot. Additional traffic counters may be installed on vehicular roads as needed. The refuge checks the number of recorded vehicles to assess frequency and periods of use. Parking lots have been constructed at the trailheads of the Freeland and Beall Tracts trails and at A-frame Road. These existing roads were created for logging or other purposes prior to refuge acquisition. In the event that roads are closed by snow, winter visitors will have to park vehicles further from pedestrian routes and gain access by snow shoeing and cross-country skiing.

A refuge officer records number of vehicles seen during patrols, types of access, user interactions, and potential safety concerns. Safety and information signs will be installed and maintained as necessary. Roads are and will be maintained in such a manner as is practical to minimize environmental effects such as flooding, erosion, and sedimentation; and to provide safe conditions for public access via vehicular travel and other modes of access. Maintenance activities include roadside brushing, grading, cleaning ditches and culverts and adding gravel to road surfaces. Safety and information signs will be installed and maintained as necessary. All trail head parking lots are either gated or blocked from unauthorized vehicle access and contain appropriate signage.

(e) Why is this use being proposed?
Vehicular use of designated roads on the refuge enhances public access and provides increased opportunity to participate in priority public uses. Vehicular use of refuge roads also allows enhanced opportunities for mobility-impaired persons to engage in priority public uses as recognized in the 1994 station management plan. Public vehicular access has been allowed on designated roads since refuge establishment. At the time of refuge acquisition, the former landowner of the Main Tract allowed vehicular access on A-frame road for public "foot travel, hunting, fishing, and other recreational use" (Monongahela Power Company 1994). Designated roads for vehicular travel provide the public with an opportunity to experience the diversity of habitats and wildlife that characterize the refuge without significant environmental consequences at the current level of use. The roads have existing hard-packed surfaces and are maintained to minimize the impact of vehicle use.

Opportunities for vehicular travel exist in upland communities on adjacent lands of the Monongahela National Forest and Canaan Valley Resort State Park. These public lands however, do not provide for panoramic views of the refuge landscape, and offer no opportunities to observe the wildlife and plant communities associated with the refuge's wetland.

AVAILABILITY OF RESOURCES

Staff time associated with administration of this use is related to assessing the need for road maintenance and repair, conducting such repairs or overseeing such repairs by contracted work, maintaining associated road infrastructure, maintaining traffic counters and recording related data, analyzing use patterns, monitoring potential impacts of the use on refuge resources and visitors, and providing information to the public about the use.

The program is administered by the deputy refuge manager, resource impacts are monitored by the Wildlife Biologist, visitor use is monitored by a term refuge officer and outdoor recreation planner, and maintenance and repair is performed by a heavy equipment operator. Law enforcement is also provided by a refuge officer.

Refuge vehicles are needed to effectively administer the use. The heavy equipment operator performs the maintenance and repair of refuge roads and associated structures. The refuge has heavy equipment including a motor grader, dump truck, bulldozer, backhoe, 4x4 farm tractor, bobcat, and front-end loader.

The refuge staff will perform repair as necessary and feasible to the road system, however there is currently only one equipment operator on staff. If maintenance needs exceed the capability of refuge staffing, work will be contracted as possible to perform road maintenance.

Annual costs associated with the administration of vehicular access on the refuge are estimated below:

Administration, planning and consultation with refuge staff

- GS-13 Refuge Manager for 2 work days =$900.48

Road maintenance and repair (filling significant potholes, maintaining water bars, cleaning culverts, installing culverts, brush clearing) sign installation and kiosk construction and repair, cleaning and maintaining parking areas

- WG-10 Equipment Operator for 10 work days = $2,725.60

Planning and monitoring road conditions and supervising staff to monitor vehicle travel and its effects on environment and other visitors

- GS-11/12 Deputy Refuge Manager for 3 work days = $836.16

Law enforcement, monitoring vehicle travel and interactions with other users, visitor services, traffic counter maintenance/data collection, sign maintenance

- GS-9 Park Ranger for 14 work days = $ 3,440.64

Monitoring environmental effects of vehicle travel

- GS-12 Wildlife Biologist for 2 work days (training & inspection) = $735.04
- GS-11 Wildlife Biologist for 5 work days (monitoring & invasive spp. control) = $1,486.40
- GS-7 Biological Science Technician for 5 work days (monitoring and invasive species control) = $1,004.40

Providing information to the public and analyzing traffic counter and user data

- GS-11 Park Ranger for 10 work days = $3,530.40

Motor vehicle fuel / law enforcement patrols = $300.00
Heavy equipment fuel = $350.00
Gravel and culverts for repairing wash outs = $5,500.00
Kiosk construction, repair, signs, printing maps and information = $550.00

Grand Total Estimated Costs = $21,359.12

FY 2009 Budget Allocations:

Employee Salaries and benefits = $624,039.53
Fixed costs (utilities, fuel, administrative) = $211,415.23
Base maintenance = $50,000
Discretionary Funds (maps, printing, etc.) = $62,243.32
Total Available Funds for FY 2009 = $947,698.08

The financial and staff resources necessary to provide and administer this use at its current level are now available. We expect the resources to continue in the future, subject to availability of appropriated funds.

ANTICIPATED IMPACTS OF THE USE

Potential long-term direct impacts of vehicle access include habitat loss, alterations to hydrology, pollution, soil compaction and erosion, sedimentation, wildlife disturbance due to vehicular traffic, and wildlife mortality (road kills) and injuries. Potential short-term direct impacts include noise and minor downstream sedimentation from dust and erosion. Indirect impacts include wildlife disturbance resulting from increasing human activities facilitated by vehicular access into wildlife habitat. A summary of potential and anticipated impacts to refuge resources follows.

Debrushing will be performed on an as needed basis depending on vegetative conditions along the road. Debrushing will be performed after August 1 to avoid disturbance to nesting birds along roadsides. Likewise, roadside ditches that support breeding amphibians earlier in the year typically are dry and are devoid of amphibians by early August. This treatment is necessary to properly maintain roads for automobile travel, to increase vision around curves, prevent contact of vehicles with roadside brush, allow proper grading and crowning of road surfaces, and enable maintenance of drainage ditches that aid in preventing road washouts. It is anticipated that debrushing activities will be required irregularly based on existing vegetative conditions along roads.

Anticipated impacts of vehicle travel on habitat includes the permanent loss of vegetation as a result of the road itself, loss of road side vegetation from debrushing activities and potential fragmentation of wildlife habitat. Because these roads have been in existence for many years and habitat loss is confined to a narrow corridor, impacts to wildlife and plant species are not expected to be significant. Refuge staff will conduct surveys for rare plant species to ensure that no impacts will result from vehicle traffic and maintenance operations.

Effects on Soil: Roads promote soil erosion, primarily from sediment runoff following rains and during snowmelt. The potential for erosion increases with grade and slope on which the roads are constructed. A-frame Road, the longest refuge road has an approximate slope of 2.7 percent, which is not likely to contribute significantly to erosion. The road does not run parallel to waterways, so potential for direct runoff and sedimentation into streams is minor. FR 80 is a steeper road but is maintained several times a year to prevent erosion and culvert plugging. Narrowing the road to decrease total surface area available for runoff will help prevent future erosion and ease maintenance operations. Improvements have been made to improve water flow and reduce soil erosion from the road surface.

It is anticipated that some soil erosion will occur as a result of the continued use of the designated vehicle routes. Maintenance operations to reduce soil erosion and sedimentation will be performed by the refuge as necessary. Based on current conditions and use, the designated vehicle routes are not likely to cause significant increases in erosion and sedimentation.

Effects on Hydrology: Roads can affect the hydrology of an area, primarily through alteration of drainage patterns. A number of culverts exist on A-frame Road and it crosses at least 15 intermittent and year round streams within the Main Tract. FR 80 crosses several drainages and channels water long distances down the road surface. New culverts and road construction improved drainage and erosion from historical conditions. The size and location of culverts that provide drainage underneath roads for feeder streams or drainage gullies

generally prevent stream or drainage impediment. However, occasional heavy storm flows may exceed culvert capacity and road over wash or breaches may result.

Bill Zeedyk (2002), a contract hydrologist, evaluated the hydrological effects of A-frame Road and FR 80 and the ramifications for plant communities on the refuge. Some of the biggest problems with both roads and trails were drainage issues, where water was being channeled down the road surface for long distances. Other problems included improper culvert placement and design and lack of regular maintenance. Corrective actions have taken place prior to the Comprehensive Conservation Plan (CCP) to restore hydrologic flows, protect plant communities, and prevent erosion. Major road repairs that have occurred on both FR 80 and A-Frame Road include replacement and installation of culverts to improve surface drainage. Regular road and culvert maintenance helps reduce erosion and sedimentation of streams and seeps.

Effects on Invasive Species: Roads can facilitate the introduction and spread of invasive and exotic plant species. These invasions result from the use of foreign material to construct and maintain roads, and from transport via motor vehicles traveling on roads. Exposed soil and abundance of sunlight along roads provide ideal conditions for the establishment of many invasive species. Reed canary grass *(Phalaris arundinacea)* has been seen with greater frequency in the valley's wet meadows and a small colony of Japanese knotweed (*Polygonum cuspidatum)* has been observed by refuge staff on Route 32. Multiflora rose (*Rosa multiflora*) and garlic mustard (*Alliaria petiolata*) are often found along roads and power lines. Yellow iris (*Iris pseudacorus*) is a management concern in wetlands at the Canaan Valley State Park and has been found on the refuge, but not associated with the subject roads. Garlic mustard has been documented along A-Frame road where disturbance is regular from ditches and culverts.

Areas disturbed by vehicle access in Canaan Valley are susceptible to colonization with exotic plant species. Stout (1992) found that trails created through emergent wetlands were being colonized by barnyard grass *(Echinochloa crusgalli)*. This species is on the State list of invasive exotic plant species and has the ability to displace native plants. However, designated routes will not create any new routes through previously undisturbed plant communities and will only occur on existing upland roads.

Based on the current level of use it is anticipated that no significant increases in invasive plant species will result from this use. Routes designated for vehicle travel are old logging roads that have been used for decades prior to refuge acquisition. New maintenance operations have brought in significant quantities of limestone gravel which can increase the potential of invasive species spread through modification of soil chemistry. Imported gravel may also transport new invasive plants onto the refuge and periodic ditch cleaning may create conditions conducive for the establishment of invasive species. This can be mitigated partly by only using sandstone gravel. Unlike limestone, sandstone gravel will not materially change soil conditions through buffering effects that can favor exotic plant species. Therefore, we will use sandstone gravel in the future. Routes designated for vehicle travel will be monitored for invasive plant species annually. Refuge staff will implement control measures for invasive plants if they become established along vehicle routes.

Effects on Pollution and Noise: Motor vehicles emit pollutants, create noise, and their use can disturb wildlife and humans. Pollutants from vehicle exhausts include hydrocarbons, nitrous oxide, and carbon monoxide. Such pollutants can negatively impact air and water quality that can have negative effects on plants, wildlife, and aquatic resources. The emission level of pollutants from automobiles on the Main Tract is unknown. According to the National Oceanic and Atmospheric Administration, Canaan Valley is impaired by high concentrations of ozone and acid deposition from sulfur and nitrogen emissions (Vogel 2001). However, the pollutants from vehicles on refuge roads are likely to be more local compared to emissions from power plants in the Ohio Valley region.

Noise levels from motor vehicles on the refuge have not been documented. The experience of visiting the refuge could be impacted by vehicle noise through the continued use of refuge roads. Wildlife may also be affected by vehicle noise causing animals to avoid roads or run from approaching vehicles. Noise from motor vehicles primarily results from the sound of tires on the gravel road surface and from metallic sounds of body and chassis vibration. Generally, vehicular noise is infrequently heard on the refuge roads and hiking trails. Depending on conditions and location, vehicles generally are audible from an estimated several hundred yards to perhaps a half-mile distant from the listener. Other sources of noise include vehicle traffic along Route 93, chainsaws from neighboring lands, and occasional military and civilian aircraft over-flights. It is anticipated

that pollution and noise impacts from vehicle travel under the current use level will not significantly impact refuge resources or visitor experiences.

Effects on Wildlife: Roads facilitate human access into wildlife habitat. Vehicular traffic and associated human activity can cause disturbances to wildlife. Those disturbances vary with the wildlife species involved and the type, level, frequency, duration and the time of year those activities occur. For example, black bears may be affected by areas of high road densities but will readily cross lower traffic volume roads (Brody and Pelton 1989). Van der Zande et al. (1980) found that roads could cause disturbance to bird species up to 600 meters from "quiet rural roads". However, many bird and mammal species are commonly observed within sight of refuge roads. This is particularly true for wild turkey, ruffed grouse, black bear and white-tailed deer that may use roads for brood habitat and movement corridors. The relatively low volume of traffic and maintenance operations of refuge roads compared to typical "rural roads" likely minimizes the effect of these roads on refuge wildlife populations.

Some portions of A-frame Road and FR 80 may have more importance as natural corridors for wildlife species. For example, the gap between Cabin Knob and the unnamed knob to the north that FR 80 traverses, and a gap located on A-frame Road near the Grant County line, may serve as natural corridors for mammals linking the Canaan Valley to the higher plateau habitats associated with the Dolly Sods Wilderness Area. The road segments in these gap areas may create greater disturbances to mammal species as a result. However, many mammals are nocturnal and will be utilizing this corridor when refuge roads are closed to public use traffic. Animals traveling within or directly adjacent to roads generally flee from vehicles although vehicles sometimes kill vertebrate and invertebrate species. For instance, snakes might be killed while basking on sun-warmed road surfaces and amphibians may be killed when crossing roads during spring migrations in April and May.

West Virginia northern flying squirrels have been documented on refuge property near the end of FR 80. This species has recently been removed from the endangered species list. The recovery plan (USFWS 2001) notes that habitat modification may create a competitive advantage for the southern flying squirrel (*Glaucomys volans*), although no additional road clearing is planned for FR 80. Some research has found northern flying squirrels occupying den sites near logging roads, skid trails and on hiking trails (Ford 2002). Research on the refuge has found West Virginia northern flying squirrels living directly adjacent to FR 80 including a pregnant female. Use of the habitat adjacent to FR 80 is monitored annually by refuge staff. As mentioned previously, we will periodically evaluate these activities to determine any effects they may have. If evidence of unacceptable adverse impacts appears, the location(s) of vehicle travel will be curtailed or discontinued as needed.

Vehicle travel is limited to the hours when the refuge is open to the public (one hour before sunrise to one hour after sunset). This minimizes evening disturbance when mammals are most active. No known significant concentrations of wildlife occur near designated refuge vehicle routes. Overall, traffic patterns are considered relatively sporadic although there is greater use during the hunting season.

Effects on Threatened and Endangered Species: The refuge provides habitat for threatened and endangered species. The threatened Cheat Mountain salamander (*Plethodon nettingi*) uses the litter on the forest floor as cover and foraging areas. They are also sensitive to any habitat changes that removes forest canopy or reduces soil moisture and relative humidity (USFWS 1991). Because of this species' reliance on high soil moisture and relative humidity, Cheat Mountain salamanders are not likely to be found on or crossing an established road or trail that is exposed to the heating and drying effects of the sun and wind. Cheat Mountain salamander populations have been confirmed at higher elevations in the southern end of the refuge and at a distance of at least 754 feet from FR 80 (USFWS 2008). This distance is far more than the 300-foot buffer zone recommended in the recovery plan for this species (USFWS 1991). Because this use will occur on pre-existing roads, no new habitat will be disturbed where the salamander is found.

The refuge requested Section 7 informal consultation with the Service's West Virginia Field Office under the Endangered Species Act (16 U.S.C. 1536) on all the actions in this CCP, including vehicle use, that could potentially impact listed species. This process resulted in a finding that the proposed actions are not likely to adversely affect any of the listed species or their associated habitats on the refuge. The full intra-Service Section 7 Biological Evaluation form can be found in appendix H of this CCP.

Indiana Bat—Indiana bats were documented on the refuge for the first time through acoustical monitoring conducted by the U.S. Forest Service in 2003 (Ford 2003). Indiana bats were found foraging at two locations in the south end of the refuge. The refuge began conducting acoustical surveys in 2005. These surveys have documented three likely Indiana bat observations in the same location as the 2003 survey during 2005, 2007, and 2008. Additionally, acoustical surveys documented one new location for the species during 2007. Indiana bat calls have been documented from the refuge in the months of May, July, August, and September. However, since the use is restricted to day time hours, disturbance of foraging bats is unlikely. The refuge will be investigating Indiana bat use in greater detail. If habitats used by this species, particularly any identified roost sites, are near roads used by vehicles, the use will be reevaluated for its impact. The refuge will consult with the Service's West Virginia Field Office when any new information is gathered on the presence of Indiana bats or use of refuge habitats to ensure that vehicle use will not affect the species. We will periodically evaluate this activity to determine any effects it may have. If evidence of unacceptable adverse effects appears, the location(s) of activities will be curtailed or discontinued as needed.

It is anticipated that vehicle use of the existing designated roads is not likely to adversely affect threatened or endangered species. The use will be confined to existing roads and no new construction or vegetation clearing will be permitted.

User Conflicts and Safety: Roads designated for vehicle access are also designated for bicycle, horseback, and pedestrian travel. Conflicts between trail users are commonly reported in the literature (Chavez et al. 1993, Watson et al. 1994, Knight and Gutzwiller1995, Ramthun 1995). Conflicts range from concerns over personal safety to certain user groups feeling that they should be given priority over other groups based on a past history or other reasons. Based on interviews with individuals and user groups, conflicts between groups are not significant in Canaan Valley. This is likely due to the relatively low number of users in the area, as compared with heavy use at conflict sites reported in the literature. Providing safe routes for wildlife-oriented activities is an important consideration for refuge roads. Safety considerations include ability of multiple modes of access to use a road without creating dangerous conditions, ability to maintain a road to allow safe use, and timing of various uses such as wildlife observation and hunting activities. Under the current level of use, routes open to vehicles are wide enough to allow multiple modes of access to occur without anticipated conflicts or safety concerns.

Cultural Resources: This use, as described, will not impact cultural resources.

Summary:
The 16 acres of direct habitat loss from the historical foot print of refuge roads, and any negative impacts resulting from the existence and maintenance of A-frame road and FR 80 (erosion, sedimentation, hydrological alteration, pollution, or wildlife disturbance) are not considered to constitute a significant long-term impact. These roads have been in existence for many years and wildlife has likely adapted to their presence. The current use is an effective and manageable method of access to the subject land, particularly the more remote northern end of the refuge via A-frame Road. These roads enable the public to discover, experience, and enjoy the refuge and participate in priority public uses. Continued monitoring of the impacts of vehicular access, and associated human activities, is necessary to better understand how this use impacts refuge habitat and wildlife resources. Monitoring helps identify and implement necessary measures to correct problems that may arise in the future (i.e., practice adaptive management).

PUBLIC REVIEW AND COMMENT

This compatibility determination was released concurrent with the draft Comprehensive Conservation Plan/ Environmental Assessment for a 45-day public review and comment period.

DETERMINATION (CHECK ONE BELOW):

_____ Use is not compatible

__X__ Use is compatible with the following stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

—Vehicle travel is restricted to refuge public use hours: Between one hour before sunrise and one hour after sunset.

—Signs necessary for visitor information, safety, and traffic control will be installed and maintained as necessary. If signage does not prevent unauthorized vehicle travel, gates will be installed as needed to protect refuge resources.

—The refuge will conduct an outreach program to promote public awareness and compliance with refuge public use regulations.

—In order to provide for visitor safety and maintain a high-quality setting for wildlife observation, a speed limit of 25 miles per hour will be imposed. This speed limit will also allow the shared use of the roadway with other users. Regulations for road use will be posted at kiosks at major vehicle access points.

—The provisions for vehicle travel on national wildlife refuges as contained in *Title 50 Code of Federal Regulations*, section 27.31, will be implemented including: establishing designated routes of travel that are conveyed to the public through signs and/or maps, assimilation of State laws and regulations governing the operation and use of vehicles, no operation of vehicles while under the influence of intoxicating beverages or controlled substances, reasonable and prudent operation, maximum speed limit, prohibition of vehicles producing excessive noise or visible pollutants, requirements for properly operating muffler, brakes, brake lights, headlight and tail lights, vehicle operators must be properly licensed, vehicles must be properly registered, licensed, and inspected, and vehicle operators must not obstruct the free movement of other vehicles.

—Vehicles must park in designated parking areas. On A-frame road, vehicles are permitted to park on the shoulder of the road during hunting season as long as they are not restricting vehicle flow.

—Refuge staff will conduct invasive species monitoring and control operations to effectively prevent the establishment of invasive plants along vehicle routes.

—All routes designated for public access are annually inspected for maintenance needs. Prompt action is taken to correct any conditions that risk public safety. Roads will be maintained at a level that reasonably accounts for safe vehicular travel.

—Routes designated for public access are monitored annually to determine if they continue to be compatible. Biological inventories continue to provide baseline information to measure change against. Should monitoring and evaluation of the use indicate that the compatibility criteria are or will be exceeded, appropriate action will be taken to ensure continued compatibility, including modifying or discontinuing the use.

—Refuge officer patrols include recording visitor numbers, vehicle numbers, visitor activities, and activity locations to document current and future levels of refuge use. Patrols also include the routine assessment of safety conditions and visitor interactions on Refuge Routes. Conditions that are risky or will risk public safety will be identified and appropriate action will be promptly taken to correct such conditions.

—The refuge conducts annual assessments of visitor perceptions of refuge uses and the management of access routes. A visitor survey will be developed and executed upon approval. Providing for safe public use through proper administration and regulation, public education, and law enforcement will be essential.

JUSTIFICATION

Anticipated impacts of vehicle travel on habitat include the permanent loss of vegetation as a result of the road itself, loss of road side vegetation, and potential fragmentation of wildlife habitat. These roads were constructed prior to the refuge's acquisition and are being maintained to provide public and staff access to refuge lands. No new roads are being proposed so the impacts will be limited to the pre-existing routes. It is anticipated that some soil erosion will occur as a result of the continued use of the designated vehicle routes. Maintenance operations to reduce soil erosion and sedimentation will be performed by the refuge as necessary. Based on current conditions and use and the regular maintenance conducted by refuge staff, the designated vehicle routes are not likely to cause significant increases in erosion and sedimentation. In fact, since refuge acquisition, these roads have been significantly improved to reduce soil erosion and sedimentation through annual maintenance. Because refuge roads are not constructed on wetlands and through continued road maintenance, no significant effects on wetlands are expected. Therefore the use will not affect the refuge's ability to fulfill the purposes established under the Emergency Wetland Resources Act (1986).

Vehicular traffic can also affect wildlife and habitat through pollution and noise. However, vehicle traffic on refuge roads is low and sporadic. Direct habitat loss, and any negative impacts of roads resulting from the existence and maintenance of A-frame road and FR 80 (erosion, sedimentation, hydrological alteration, pollution, invasive species, or wildlife disturbance) are not considered to constitute a significant long-term impact. Routes designated for vehicle travel are old logging roads that have been used for decades prior to refuge acquisition. Because these roads have been in existence for many years and habitat loss is confined to a narrow corridor and is a small fraction (.09 percent) of the total refuge acreage, impacts from continued use to wildlife and plant species are not expected to be significant. The roads are generally peripheral to refuge core habitat areas. Therefore the majority of refuge habitats will remain intact and unaffected by the roads' presence and vehicular use. Because of the fact that vehicles are not expected to significantly affect wildlife populations on the refuge, this ensures that the refuge will meet its obligations as stated in the Fish and Wildlife Act (1956) and the mission of the Refuge System.

By utilizing sandstone gravel, rather than limestone, the refuge will reduce chances of invasive species establishment when conducting routine maintenance. Regular road surveys for invasive species will still be needed but are easily conducted (due to the linear nature of the survey area) and this is considered a manageable risk based on the past 5 years of refuge road surveys. Through continued survey and control efforts, invasive species establishment will be limited and not affect the refuge's purpose of ensuring the ecological integrity of Canaan Valley (1979 EIS).

Only FR 80 occurs in areas which are occupied by threatened Cheat Mountain salamanders. However the nearest known Cheat Mountain salamander habitat is 754 feet from FR 80 (USFWS 2008), far more than the 300-foot buffer recommended in the recovery plan for this species (USFWS 1991) Endangered Indiana bats have been found foraging nearby the road corridor. Disturbance to foraging bats will be prevented by the refuge-specific regulations to close one hour after sunset. Any new information collected on the locations of foraging, roosting or maternity sites for Indiana bats will be discussed with the Service's West Virginia Field Office to ensure that continued vehicle use of FR 80 will not affect this species on the refuge.

Roads designated for vehicle access are also designated for bicycle, horseback, and pedestrian travel. Based on interviews with individuals and user groups, conflicts between groups are not significant in Canaan Valley. Roads designated for vehicle use permit access to remote parts of the refuge (A-frame road) and connect the

refuge to other public lands (FR 80). These roads are necessary to facilitate priority public uses and to meet other management objectives such as providing hunter access to remote areas of the refuge and to provide connectivity for public use between refuge and other public lands. Vehicle access will not affect the refuge's ability to conserve the wetlands of Canaan Valley as provided in the establishing purposes of the refuge through the Emergency Wetland Resources Act (1986). This use will also not affect the refuge's ability to protect, manage, and restore the wildlife and plant resources, as mandated through the Fish and Wildlife Act (1956), or the mission of the National Wildlife Refuge System. The refuge will still be able to meet its establishing purpose of protecting the ecological integrity of Canaan Valley as directed by the 1979 EIS, and particularly of ensuring the continued availability of refuge resources to the public. No roads occur on the properties acquired under the authority of the Migratory Bird Conservation Act (1929); therefore, this use will not affect the refuge's ability to conserve and manage migratory birds on these tracts. Without these roads, accessibility to refuge habitats would be greatly compromised.

For these reasons, vehicle use as identified in this compatibility determination is not expected to materially interfere with or detract from the mission of the National Wildlife Refuge System or the purposes for which the refuge was established. Monitoring will be conducted to ensure this use remains compatible. If significant impacts are found, corrective actions will be taken to protect refuge resources.

SIGNATURE:

Refuge Manager: Kenneth K. Fenn Acting 2/14/2011
(Signature) (Date)

CONCURRENCE:

Regional Chief: Anthony D. Léger 02/25/2011
(Signature) (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: 02/25/2021

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COMPATIBILITY DETERMINATION

USE

Public Beaver Trapping for Habitat Management Purposes

REFUGE NAME

Canaan Valley National Wildlife Refuge

DATE ESTABLISHED

August 11, 1994

ESTABLISHING AND ACQUISITION AUTHORITY

The establishment of Canaan Valley National Wildlife Refuge (refuge) was first approved in an Environmental Impact Statement (EIS) released on May 30, 1979. However, the U.S. Fish and Wildlife Service (Service) decided to await the outcome of litigation surrounding a proposed storage hydroelectric facility before pursuing any further action. The approval of the refuge was affirmed by the Service in a 1994 Final Environmental Assessment and Finding of No Significant Impact on July 11, 1994, which confirmed the adequacy of the previously approved 1979 EIS. The refuge was officially established when the first tract of land was acquired on August 11, 1994. The Service has acquired lands for the Canaan Valley refuge under the following authorities:

1) Fish and Wildlife Act of 1956 [16 U.S.C. 742f(a)(4)]

3) Emergency Wetlands Resources Act of 1986 [16 U.S.C. 3901b]

4) Migratory Bird Conservation Act of 1929 [16 U.S.C. 715d]

REFUGE PURPOSES

The refuge was established to ensure the ecological integrity of Canaan Valley and the continued availability of its wetland, botanical, and wildlife resources to the citizens of West Virginia and the United States (USFWS 1979, 1994). Additional refuge purposes as derived from the legislative authorities are as follows:

(1) "... for the development, advancement, management, conservation, and protection of fish and wildlife resources..." (Fish and Wildlife Act of 1956; 16 U.S.C. 742f (a)(4));

(2) "... for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions." (Emergency Wetlands Resources Act of 1986; 16 U.S.C. 3901(b)); and,

(3) "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (Migratory Bird Conservation Act of 1929; 16 U.S.C. 715d).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans. National Wildlife Refuge System Improvement Act, 16 U.S.C § 668dd(a)(2).

DESCRIPTION OF PROPOSED USE:

(a) What is the use? Is it a priority public use?
The use is regulated trapping as part of an integrated approach to beaver management on all Service-owned lands within the boundary of the refuge, in accordance with laws and regulations of the United States and the State of West Virginia, and refuge special use permit (SUP) conditions. This use is not a priority public use of the National Wildlife Refuge System (Refuge System) under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57). Because pelts are retained by trappers and can be sold this use is also a refuge management economic activity as described by 50 Code of Federal Regulations (CFR) 25.12. National Environmental Policy Act analysis was done on this use in 2004, with the Furbearer Management and Trapping Environmental Assessment (EA).

(b) Where would the use be conducted?
The primary areas targeted for trapping will be locations where beaver flooding has caused damage or threatens to damage refuge resources such as flooding of riparian forest habitat (or other sensitive plant communities) or refuge roads and trails. Seasonal inventory of beaver activity will be conducted by refuge biologists to determine locations for regulated beaver trapping. A majority of the use will occur on refuge Tracts 50 and 100 also known as the Main Tract. Trapping will focus on the beaver ponds and corridors of the Blackwater River and its tributaries. Some trapping may also occur on wetland areas on or near Tract 200 (Freeland Tract) on the refuge's south end.

(c) When would the use be conducted?
The use will be conducted within the season framework set by the State of West Virginia. Typically, beaver trapping occurs between November 1 and March 31.

(d) How would the use be conducted?
Beaver trapping will be conducted under a refuge SUP and will follow State regulations and seasons. Permits will be issued for specific areas on the refuge where trapping could resolve or prevent a management problem. Locations of targeted trapping efforts will be determined through monitoring of beaver activity and documenting locations where plant communities or other resources are being impacted through beaver flooding activity. A determination will be made for specific locations on the refuge indicating that beaver presence is out of balance with resource protection. The refuge manager reserves the ability to control numbers of beaver taken in any one location, if it is desirable to remove some, but not all beaver. This may be desirable where beaver are causing impacts to Refuge resources, but are still valuable for wildlife observation and education. Removal of beaver for resource protection is authorized under 50 CFR 31.2, 31.14, and 31.16.

Trappers will request a permit from the refuge manager before the beginning of each trapping season. The refuge will ensure that, if the individual is a returning trapper, the appropriate paperwork for prior seasons was submitted to the refuge office. A harvest report will be required from each trapper following the close of trapping season and will include data about trapping effort, time span of trapping beaver, number of target and non-target species harvested, refuge areas trapped, and remarks on observations of wildlife and other noteworthy ecological information. These data can provide a basis for catch-per-unit effort and population trend analyses. If information were lacking for a trapper from the previous year, the SUP would not be issued.

Trapping zones may be instituted to reduce the potential for conflict between individual trappers. Trapping equipment will be supplied by the trappers and will comply with State regulations.

If public trapping did not resolve impacts to refuge resources, refuge personnel and/or refuge appointed contractors would be assigned to remove problem animals. This scenario could occur if locations of targeted beaver populations are hard to access such as in the main portion of the valley. Areas in the Main Tract can be difficult to access, particularly in the winter when the State trapping season occurs. Low pelt values and prohibiting wheeled vehicle access may limit the interest of public trapping.

(e) Why is the use being proposed?
The need is to preserve and protect plant communities of special interest on the refuge, such as the relict boreal vegetation in the valley. These are the only plant communities on the valley floor that resemble the original red spruce forests and are plant communities the refuge is obligated to protect. Flooding is also a concern where beaver activity exists adjacent to refuge public use trails. Through this CCP, the Service intends to assess the environmental impact of regulated trapping as a tool for beaver management on the refuge to protect refuge plant communities and infrastructure.

Previous owners of lands that now comprise the refuge permitted trapping beavers. Land acquired in 2002 from Allegheny Energy has sustained beaver trapping under State regulations and contains the majority of beaver habitat on the refuge. The area also harbors 73 plant species listed as species of special concern by the State of West Virginia. These plants and plant communities have been impacted by flooding activities caused by beaver inhabitation. The impact of beaver activity has been documented many times in Canaan Valley by wetland researchers (Fortney 1975, Fortney 1997, Fortney and Rentch 2003, Snyder et al. 2006). Fortney (1997) concludes, "If the present population of beavers in Canaan Valley is not greatly reduced in the near future, a larger proportion of the swamp forests will be destroyed…". Importantly this statement was written when trapping in the refuge-owned portion of the valley was permitted by the previous landowner, Allegheny Energy. Without trapping pressure to reduce beaver densities, increased loss of bottomland forest communities will continue and likely accelerate.

Management of beaver populations on the refuge will aid in the protection of selected plant species and plant communities of concern. This use is being proposed to eliminate or reduce damage to refuge resources from beaver-induced flooding.

Furbearers are considered a renewable natural resource with cultural and economic values (Payne 1980, Andelt et al. 1999, Boggess et al. 1990, Northeast Furbearer Resources Technical Committee 1996). Several human dimensions studies have documented trapper profiles, cultural aspects of trapping, and the socioeconomic role of trapping in the United States (Gentile 1987, Boggess et al. 1990, Daigle et al. 1998, Andelt et al. 1999). Trapping is an activity in which family members and friends often participate together and share joint experiences that broaden the sense of appreciation for natural resources and ecological awareness (Daigle et al. 1998).

AVAILABILITY OF RESOURCES

The refuge manager will provide overall administration of the program. A wildlife biologist will be required to evaluate beaver activity, potential, and current impacts on refuge resources. The biologist will also be required to evaluate trapper data and compile trapping reports. An administrative assistant is required to help process SUPs and enter trapping data into a database. A refuge law enforcement officer will be required to check refuge trappers and ensure compliance with State and refuge regulations. An outdoor recreation planner is responsible for public outreach related to this program. Additional funds may be required if trapping activities would need to be conducted by refuge staff or contract employees.

Annual costs associated with the administration of a regulated trapping program on the refuge are estimated below:

Planning and supervising staff to monitor the use and its effects on environment and other visitors:

- GS 11/12 Deputy Refuge Manager for 3 work days = $836.16

Monitoring habitat impacts from trapping activities and issuing SUP's:

- GS 12 Wildlife Biologist for 10 work days = $3,675.20

Providing information to the public about management trapping and compiling use data

- GS-11 Park Ranger for 2 work days = $706.08

Resource Protection, monitoring fishing activities and interactions with other users, visitor services, sign maintenance, litter removal

- GS-9 Park Ranger for 10 work days = $2,457.60

Administrative work, permit issuing:

- GS-5 Administrative Assistant for 5 work days = $724.80

Vehicle fuel / law enforcement patrols = $100.00

Annual program (estimated) cost: $8,499.84

FY 2009 Budget Allocations:

Employee Salaries and benefits = $624,039.53
Fixed costs (utilities, fuel, administrative) = $211,415.23
Base maintenance = $50,000
Discretionary Funds (maps, printing, etc.) = $62,243.32
Total Available Funds for FY 2009 = $947,698.08

The financial and staff resources necessary to provide and administer this use at its current level are now available. We expect the resources to continue in the future, subject to availability of appropriated funds.

ANTICIPATED IMPACTS OF THE USE

The anticipated impacts of trapping on refuge resources are detailed in the refuge's approved 2004 EA for Furbearer Management and Beaver Trapping. Below is a summary of the impacts detailed in that EA. In general, the impacts from trapping are extremely low because of the low level of use. Over the past six years, an annual average of only three trappers has participated in the public trapping program. Low pelt values and the prohibition of vehicle access may contribute to the low public interest in this activity. We predict this level of use will not change in the future. This low level of use ensures that trapping remains a low-impact tool for achieving the refuge's habitat management goals.

The CCP also allows refuge personnel and/or refuge appointed contractors to remove problem animals when public trapping does not resolve impacts to refuge resources. This may require the expenditure of additional funds to conduct trapping activities by refuge staff or contract employees. Money spent conducting this activity would deplete funds that could be used for other refuge management activities. However, only when public participation (through SUP) is not adequate for resolving the beaver impact would the refuge manager make

the decision to undertake removal operations using refuge staff or contract employees. The use of refuge staff or contractors will be the last choice in resolving beaver impacts to refuge resources, but will be available if necessary.

The primary areas targeted for trapping will be locations where beaver flooding has caused damage to refuge resources such as flooding of riparian forest habitat (or other sensitive plant communities) or refuge roads and trails. Seasonal inventory of beaver activity will be conducted by refuge biologists to determine locations for regulated beaver trapping. Refuge law enforcement will ensure that trappers on the refuge were complying with State and refuge regulations and that data submitted to the refuge is accurate. Designation of trapping zones may help prevent conflicts between trappers and zones are given on a first come first serve basis.

In addition, identifying trapping zones will allow the refuge to concentrate trapping efforts in areas where management intervention is necessary to prevent resource damage. Identifying locations where specific trappers are permitted on the refuge will facilitate enforcement of refuge and State regulations. Zoning may also provide better quality trapping experiences by preventing overlap with other trappers. For example, an experienced trapper may prefer to trap in areas without other trappers, to teach children or other family members. However, if necessary, trapping effort may be concentrated or zoning eliminated to meet refuge resource protection goals.

The refuge will be able to control trapping pressure through the SUP process and deny permits to trappers who do not comply with regulations. By administering the program under an annual SUP, the refuge manager is able to maintain a list of trappers that are available for helping with specific management needs such as dealing with problem areas, targeting offending beavers for removal, and assisting with wildlife and habitat surveys or research.

In locations where beaver are causing impacts to refuge infrastructure (roads, trails etc.) exclusionary fencing and water flow control devices may be used. This method may be chosen in conjunction with a regulated trapping program or as a way to limit damage where trapping may not be preferable. Jensen et al (2001) note that using larger (or oversized) culverts can reduce many beaver impacts to roads. However, it is also noted that other water control devices may be required in conjunction with larger culvert sizes (Jensen et al. 2001). A variety of beaver control structures have been created and tested including water level control devices that are placed within the existing dam as well as cattle fencing to exclude beaver from a particular area (Northeast Furbearer Resources Technical Committee 1996). The refuge will evaluate all options when considering the management of the beaver population to protect refuge habitats and infrastructure.

Implementation of a regulated trapping program on the refuge affords a potential mechanism to collect survey and monitoring information, or contribute to research on beaver (and other wildlife) occurrence, activity, movement, population status, and ecology. By maintaining a trained and experienced group of trappers, the Service can utilize their skills and local knowledge to perform or assist with valuable management or research functions. Trappers that participate in the refuge program will provide assistance with the implementation of structured management objectives, such as alleviation or reduction of wildlife damage conflicts and negative species interactions. Refuge trappers typically have a stake in proper habitat and wildlife conservation, and protection of the ecological integrity of the refuge so that their activity can continue. Accordingly, they are valuable assets to the refuge manager in terms of providing on-site reports concerning the fundamental status of habitat, wildlife, and refuge conditions.

A national program has been designed to systematically improve the welfare of animals in trapping through trap testing and development of best management practices (BMPs) for Trapping Furbearers in the United States. This is operated under the guidance of the Fur Resources Technical Subcommittee of the International Association of Fish and Wildlife Agencies (International Association of Fish and Wildlife Agencies 1998). As would be expected, in practicing an integrated and comprehensive approach to furbearer management, the refuge will cooperate with and contribute to the development and implementation of the BMPs where possible.

This concept of cooperation is fully in keeping with the refuge's role as an outdoor laboratory for research and scientific education. Additionally, the refuge could work in cooperation with the West Virginia Trappers Association or other trapping organizations to produce educational information on trapping to inform the public on its use for management purposes.

Non-target furbearer species could potentially be taken through this trapping program. Risk of taking species other than beaver will be reduced significantly as beaver sets will occur specifically around areas of beaver activity. Selectivity for beaver can be achieved by carefully choosing trap locations, using specific beaver attractants and employing trap types and trigger configurations that are unlikely to be sprung by other species.

Over a 5 year period only nine muskrat and six snapping turtles have been taken as non target species during targeted refuge trapping efforts. According to trapper contacts, several of the snapping turtles were released unharmed due to the nature of the body gripping trap used which did not harm the turtles' carapace. Due to the reproductive capacities, this low number of captures of snapping turtles and muskrats are considered insignificant in relation to maintaining their populations on refuge lands. Trapper experience and the selection of the appropriate trap size will reduce non-target furbearer captures (Boggess et al. 1990, Northeast Furbearer Resources Technical Committee 1996). In particular, river otters are protected in the State of West Virginia. Currently the State provides trappers with recommendations on how to prevent the accidental take of river otters. This information will be made available to refuge trappers to help prevent accidental take. The Service will continue work with the State to help prevent the accidental take of river otter on the refuge through trapper education.

With respect to possible negative reaction to trapping on the refuge by the visiting public, conflicts are not expected because trapping is generally an inconspicuous activity that occurs during winter months. It also will often occur in remote areas of the refuge not accessible from public use trails. The refuge will inform the public about its trapping program through visitor contact and educational materials. Explanation of the purposes for which the trapping is conducted with focus on the protection of rare plant communities can help the public understand the program's necessity.

Impacts to Vegetation: Foot travel to trapping locations (beaver ponds and rivers) can have indirect impacts to plants by compacting soils and diminishing soil porosity, aeration and nutrient availability that affect plant growth and survival (Kuss 1986). Hammitt and Cole (1998) note that compaction limits the ability of plants to revegetate affected areas. Regularly occurring foot travel can crush plants. Rare plants with limited site occurrence are particularly susceptible. Many plant species considered rare in the State are found associated with riparian wetlands in the Canaan Valley (Bartgis and Berdine 1991). Trapping activities only occur during State regulated seasons which are outside the growing season for plants. Impacts are expected to be negligible as the number of trappers permitted is low (average of 3 per year from 2004-2009) and trapping areas are segregated to prevent overlap, further reducing trampling effects.

Effects on Soils: Soils can be compacted and eroded as a result of continued foot traffic. All soils associated with wetland habitats were rated as either high or very high in their potential for compaction (Bell 2002). Impacts to soils will likely be greater during the growing season due to the greater soil moisture content at that time of year. The Mauch Chunk-derived soil in Canaan Valley is particularly vulnerable to mechanical erosion when the vegetation has been removed (Rizzo 2002). If compacted, Mauch Chunk soils can facilitate rapid water runoff that accelerates erosion down slope (Rizzo 2002). Although foot travel did not create highly erosive conditions in this soil type, lug soles of hiking boots could perpetuate the problem. Impacts to soils are considered negligible as a result of the low number of trappers on the refuge.

Effects on Hydrology: Trails can affect the hydrology of an area, primarily through alteration of drainage patterns. Bartgis and Berdine (1991) note that roads and trails can divert water from their original drainage patterns in Canaan Valley. This can result in some drainages becoming dry while others accelerate erosion by being forced to carry more water. Zeedyk (2002) documented many instances in Canaan Valley where existing trails were channeling water away from historical wetlands and, in some cases, causing erosion and sedimentation of bog and other wetland communities. These problems have profoundly if not irreversibly altered the extent, depths, characteristics and function of the wetlands on the Main Tract (Zeedyk 2002). These impacts were preexisting at the time the refuge acquired the property and restoration actions have helped reduce the problems associated with the existing trails. Trappers are not restricted to trails and therefore will only use

them when necessary to facilitate access to designated trapping zones. Trapper foot traffic will not exacerbate existing hydrologic problems due to the low number of trappers permitted on refuge land annually.

Effects on Wildlife: Trapping will be concentrated in areas surrounding beaver ponds and along riparian corridors. Trappers will traverse other habitats moving to and from these areas. Disturbances vary with the species involved and the type, level, frequency, duration and the time of year such activities occur. Whittaker and Knight (1998) note that wildlife response can include attraction, habituation, and avoidance. These responses can have negative impacts to wildlife, such as mammals becoming habituated to humans making them easier targets for hunters. Human-induced avoidance by wildlife can prevent animals from using otherwise suitable habitat (Pomerantz et al. 1988).

Humans walking off trail have been shown to cause greater disturbance (greater area of influence, flush distance and distance moved) to wildlife than walking within trail corridors (Miller et al. 2001). Predictability of disturbance (on trail vs. off trail) has been cited as a major factor in impacts to wildlife. Walking off trail is considered less predictable to wildlife and typically more disruptive (Knight and Cole 1991, Trails and Wildlife Task Force 1998, Miller et al. 2001).

Anticipated disturbances to wildlife are likely to be short term and very infrequent based on the low number of permits issued for trapping on the refuge. Trapping season occurs outside of the breeding season and many bird species are absent from the refuge during this activity. With the refuge's ability to limit the numbers and locations of trappers participating in this activity, no major impacts from wildlife disturbance are likely.

Effects on Threatened and Endangered Species: The Federally threatened Cheat Mountain salamander (*Plethodon nettingi*) is found on the refuge. This species is associated with high elevation forested habitat, typically with some component of red spruce (*Picea rubens*) and/or Eastern hemlock (*Tsuga canadensis*), and it is likely they are restricted to the cooler mountain slopes and ridges. Because beaver inhabit wetland areas not suitable for Cheat Mountain salamanders, there will be no adverse impacts to this species.

Indiana bats (*Myotis soldalis*) were documented on the refuge for the first time through acoustical monitoring conducted by the U.S. Forest Service in 2003 (Ford 2003). Indiana bats were found foraging at two locations in the south end of the refuge. The refuge began conducting acoustical surveys in 2005. These surveys have documented three likely Indiana bat observations in the same location as the 2003 survey during 2005, 2007, and 2008. Additionally, acoustical surveys documented one new location for the species during 2007. Indiana bat calls have been documented from the refuge in the months of May, July, August, and September. However, since trapping is restricted to day time hours, and must comply with certain stipulations, there will be no adverse effects. We will periodically evaluate this activity to determine any effects it may have. In particular the use of roost trees near beaver ponds would be a concern and would be evaluated to determine if trapping created disturbance to roosting bats. Because trapping occurs outside the season when bats will be roosting on the refuge, any impacts are considered unlikely. However, if evidence of unacceptable adverse affects appears, the location(s) of activities will be curtailed or discontinued as needed.

PUBLIC REVIEW AND COMMENT

Impacts of the proposed use were evaluated in an EA and released for public review and comment for 30 days in 2004. Beaver conditions on the refuge have not changed substantially. This compatibility determination was released concurrent with the draft Comprehensive Conservation Plan/Environmental Assessment for a 45-day public review and comment period.

DETERMINATION (CHECK ONE BELOW):

_____ Use is not compatible

__X__ Use is compatible with the following stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

The furbearer management program will be reviewed annually to assess its effectiveness and to insure and that wildlife populations and habitat quality are managed appropriately. In addition, the following refuge SUP Conditions will apply:

—Any person engaging in activities on the Canaan Valley refuge that would be defined as trapping under West Virginia State law must be in possession of a valid West Virginia trapping license and a valid refuge SUP. Trappers will present such credentials to refuge officials and law enforcement agents of United States or West Virginia upon their request. This permit is valid only for trapping conducted on the refuge during the legal trapping seasons established by the State of West Virginia and only for beaver.

—In consideration of being permitted to engage in the activity authorized under this permit at the Canaan Valley refuge, Permittee, being of lawful age, for himself and his personal representative, heirs, and next of kin, hereby releases, waives, and forever discharges the United States of America, its agents and employees, all for the purposes herein referred to as, Releasees, from any and every claim, demand, action or right of action, of whatsoever kind or nature, either in law or in equity, arising from or by reason of any bodily injury or personal injuries known or unknown, death and/or property damage resulting or to result from any injury, which may occur while engaged in the permitted activity, and covenants not to sue the Releasees, for any loss or damages, and any claim or damage therefore, on account of injury to the person or property or resulting in death of the Permittee, whether caused by the negligence of Releasees or otherwise.

—Permittee agrees to indemnify, defend, save and hold harmless the Releasees and each of them from any loss, liability, damage, or cost Releasees may incur due to the presence of Permittee in or upon the said property of the United States.

—Permittee agrees that this release and waiver is intended to be as broad and inclusive as permitted by the laws of the State of West Virginia and that if any portion thereof is held invalid, it is agreed that the balance shall notwithstanding, continue in full legal force and effect.

—Permittee will obey the laws of the United States and West Virginia, including those concerning trapping, firearms, and motor vehicles while engaged in activities connected with this permit.

—Travel by motor vehicle is restricted to established roads, and travel by snowmachine and all-terrain vehicle is prohibited.

—Permittee will use every feasible precaution against causing damage to refuge roads, lands, and waters. Permittee will report any damages as soon as possible.

—Permittee will not conduct activities in connection with this permit in any manner that would interfere with or cause hazards to vehicular travel or the activities of refuge visitors.

—Permittee shall not litter, start fires, or use open fires on refuge lands.

—Permittee is required to submit a completed refuge trapper report accompanying this permit to the Refuge manager within 30 days of the close of the West Virginia trapping season. Report forms MUST be submitted whether or not any trapping was conducted or any animals were captured. NOTE: Failure to submit this report will be grounds for denial of a refuge-trapping permit for the following season.

—Connabear Traps of size 8x8 and larger are permitted. No sizes smaller than 8x8.

—Leg hold traps no smaller than a size 7 are permitted and only if used in a drowning set. Traps should be set for a hind foot capture to prevent non-target wildlife captures.

—No snares will be permitted on the refuge.

—Permittee will receive and comply with information and recommendations to avoid trapping river otter and all other non-target species. Only beaver may be taken.

JUSTIFICATION

Regulated trapping is recognized by the Service as an effective, legitimate, and ecologically sound wildlife population and habitat management method on national wildlife refuges. Furbearers are considered a renewable natural resource with cultural and economic values (Andelt et al 1999, Boggess et al. 1990, Northeast Furbearer Resources Technical Committee 1996, Payne 1980). Trapping also allows the public the benefit of a renewable wildlife resource. As mentioned above and described in the approved 2004 EA for Furbearer Management and Beaver Trapping, trapping seasons and limits are established by the State and adopted by the refuge. These restrictions are designed to protect wildlife populations from over harvest. There is some risk of incidental trapping of non-target species (e.g., river otter).

Risk of taking species other than beaver will be reduced significantly through the conditions of the SUP and as described in the stipulations of this compatibility determination. Beaver sets will occur specifically around areas of beaver activity with trap sizes and set locations restricted by the permit to reduce non-target species captures. Selectivity for beaver can be achieved by carefully choosing trap locations, using specific beaver attractants and employing trap types and trigger configurations that are unlikely to be sprung by other species. In particular, risk of taking river otter will be addressed by ensuring that all trappers have access to the State's recommendations on how to prevent the accidental take of river otters.

Conflicts between trappers will be minimal because of the low level of use. Any potential conflicts will be minimized by designating trapping zones, controlling numbers through the SUP process, or through the presence of law enforcement officials. Trapping occurs during winter months, a time when other visitor numbers are low.

Anticipated disturbances to wildlife are likely to be short term and infrequent based on the current low level of use (average of 3 trappers per year between 2004 and 2009) and seasonal limitations. Sedimentation impacts will likely be insignificant from foot travel. Vegetation impacts will similarly be insignificant due to the limited number of participants and zoned locations of trapping activity. A regulated trapping program will help protect refuge habitats, specifically rare wetland forested and shrub swamp communities. Based on the current level of trapping, disturbance impacts to wildlife will be insignificant. Restrictions outlined in the SUP are designed to prevent other wildlife from being directly affected by this management activity.

Because of the low use and established SUP restrictions the refuge will continue to meet its purposes established by the Fish and Wildlife Act (1956) to manage, conserve and protect fish and wildlife resources. This use also provides a low impact method to reduce beaver impacts to wetland plant communities which supports the establishing purpose for the refuge to ensure the ecological integrity of Canaan Valley (1979 EIS) and the Emergency Wetland Resources Act (1986) by conserving wetland communities of Canaan Valley. Because of the limited use, low impact, and supporting role to wetland plant conservation in Canaan Valley, this use does not prevent the refuge from fulfilling the mission of the Refuge System by helping to conserve and manage fish, wildlife and plant resources.

Trapping may occur within riparian areas within and bordering tracts acquired under the authority of the Migratory Bird Conservation Act (1929). This use is aimed at reducing the effects of beaver flooding on rare wetland plant communities. By altering beaver impact, habitats which support migratory birds will also be altered. Other open water habitats created through flooding activities will be minimized based on location and therefore the migratory birds utilizing these communities will be affected. However, the habitats targeted for

protection are some of the rarest habitats on the refuge; therefore the migratory birds tied to these habitats will benefit from habitat protection and management. Although open water habitats are not common on the refuge, they are not as limited in distribution as the plant communities the trapping program is designed to protect. Therefore this activity will not affect the refuge's ability to meet the purposes to conserve and manage migratory birds as directed by the Migratory Bird Conservation Act (1929).

Trapping access is limited by terms and conditions outlined in special use permits to help minimize potential negative effects and maximize effective management. Allowing this use furthers the mission of the Refuge System, as required under 50 CFR 29.1, by meeting important management objectives to protect or enhance refuge ecosystems while allowing access to renewable natural resources for the benefit of the American public. For these reasons beaver trapping contributes to the establishing purpose of the refuge by helping to protect and maintain rare wetland plant communities and therefore the ecological integrity of Canaan Valley. Beaver trapping does not interfere with the other refuge purposes, namely the development and conservation of fish and wildlife resources (Fish and Wildlife Act of 1956; 16 U.S.C. 742f(a)(4)),the fulfillment of international obligations contained in various migratory bird treaties (Emergency Wetlands Resources Act of 1986;16 U.S.C. 3901(b));, and the use as an inviolate sanctuary for migratory birds (16 U.S.C. 715d (Migratory Bird Conservation Act 1929)). We have determined that regulated trapping as a component of an integrated furbearer management program at the Canaan Valley refuge will not materially interfere with or detract from fulfilling the refuge purposes and the Refuge System mission.

SIGNATURE:

Refuge Manager: ____________________ (Signature) 2/14/2011 (Date)

CONCURRENCE:

Regional Chief: ____________________ (Signature) 02/25/2011 (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: 02/25/2021

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COMPATIBILITY DETERMINATION

USE

Commercial Haying to Manage Grassland Habitat

REFUGE NAME

Canaan Valley National Wildlife Refuge

DATE ESTABLISHED

August 11, 1994

ESTABLISHING AND ACQUISITION AUTHORITY

The establishment of Canaan Valley National Wildlife Refuge (refuge) was first approved in an Environmental Impact Statement (EIS) released on May 30, 1979. However, the U.S. Fish and Wildlife Service (Service) decided to await the outcome of litigation surrounding a proposed storage hydroelectric facility before pursuing any further action. The approval of the refuge was affirmed by the Service in a 1994 Final Environmental Assessment and Finding of No Significant Impact on July 11, 1994, which confirmed the adequacy of the previously approved 1979 EIS. The refuge was officially established when the first tract of land was acquired on August 11, 1994. The Service has acquired lands for the Canaan Valley refuge under the following authorities:

1. Fish and Wildlife Act of 1956 [16 U.S.C. 742f(a)(4)]
2. Emergency Wetlands Resources Act of 1986 [16 U.S.C. 3901b]
3. Migratory Bird Conservation Act of 1929 [16 U.S.C. 715d]

REFUGE PURPOSES

The refuge was established to ensure the ecological integrity of Canaan Valley and the continued availability of its wetland, botanical, and wildlife resources to the citizens of West Virginia and the United States (USFWS 1979, 1994). Additional refuge purposes as derived from the legislative authorities are as follows:

(1) "... for the development, advancement, management, conservation, and protection of fish and wildlife resources..." (Fish and Wildlife Act of 1956; 16 U.S.C. 742f (a)(4));

(2) "... for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions." (Emergency Wetlands Resources Act of 1986; 16 U.S.C. 3901(b)); and,

(3) "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (Migratory Bird Conservation Act of 1929; 16 U.S.C. 715d).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans. National Wildlife Refuge System Improvement Act, 16 U.S.C § 668dd (a)(2).

DESCRIPTION OF USE

(a) What is the use? Is the use a priority public use?
The use is commercial haying to manage grassland habitat for nesting obligate grassland bird species on the refuge. This use is not a priority public use of the National Wildlife Refuge System (Refuge System) under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57). This use is also a refuge management economic activity as described under 50 C.F.R 25.12.

(b) Where would the use be conducted?
Haying will be permitted in designated grassland management units of the refuge. These units are currently:

Freeland Tract: 40 acres
Beall Tract: 116 acres
Harper Tract: 52 acres
Cooper Tract: 74 acres
Orders Tract: 33 acres

The configuration of the units and the number of acres managed by haying may change from year to year.

(c) When would the use be conducted?
Haying will occur only after grassland nesting birds have completed nesting activities. In Canaan Valley, this is typically in mid- to late August. Haying operations will be required to be completed (all bales removed from refuge property) within one month of the haying operation (mid- to late September). Haying will only occur on an "as needed basis" as determined by the refuge manager. Since refuge grassland management occurs on a three to five year rotation and fields are rotated to allow for standing grassland habitat to occur within a portion of managed grassland units, only a portion of refuge grasslands will be potentially available to haying operations on an annual basis. The refuge staff will determine which fields will require management on an annual basis and these fields will be available for haying operations.

(d) How would the use be conducted?
The use will be conducted by issuance of a special use permit to individuals who have the ability to complete haying operations within the specified time frame. Because of the commercial viability of the hay crop from refuge lands, operators will be solicited through open advertisement. If more than one individual responds to the request, the refuge will select the individual randomly. The Service will charge the permit holder the fair market value of the standing hay crop as authorized by 50 Code of Federal Regulations (CFR) 29.5. The funds received will contribute to the Service revenue sharing program with county government as described by 50 CFR 34.3(d).

(e) Why is this use being proposed?
This use is being proposed to facilitate refuge grassland management. By permitting haying on refuge grasslands, less time is required by staff equipment operators to conduct required management activities. This saves the refuge time and money which may be allocated to different projects. Additionally, haying removes vegetation from the field which is otherwise left using refuge brush hog mowing equipment. This rank cut vegetation builds a duff layer in the "understory" of the grassland which, over time, can make the grassland less suitable for target grassland nesting bird species. Periodic removal of the vegetation from the field helps reduce dense duff layer development and can be beneficial for nesting grassland bird species such as bobolinks and grasshopper sparrows (Warren and Anderson 2005).

AVAILABILITY OF RESOURCES

The resources necessary to provide and administer this use, at the current use level, are available within current and anticipated refuge budgets. Staff time associated with administration of this use is related to assessing the need for grassland management activities, advertising and selecting an operator to conduct haying actions, and overseeing the project.

The deputy refuge manager will administer the program. A wildlife biologist will evaluate the need for grassland management annually and select the fields which will be available for haying. A park ranger/visitor services specialist will submit the advertisement for the haying opportunity.

Annual costs associated with the administration of haying on the refuge are estimated below:

Administration, planning and consultation with refuge staff:

- GS-13 Refuge Manager for 1 work day = $450.24

Monitoring field conditions and bird breeding activity to select appropriate fields for grassland management:

- GS-12 Wildlife Biologist for 4 work days = $1,470.08
- GS-11 Wildlife Biologist for 2 work days= $594.56
- GS-7 Biological Technician for 2 work days = $401.76

Outreach and education, providing information to visitors:

- GS-11 Park Ranger for 1 work day = $353.04

Oversight and administration

- GS-11/12 Deputy Refuge Manager for 7 work days = $1,951.04

Law enforcement and regulations

- GS-9 Law Enforcement Officer for 2 work days = $491.52

Vehicle fuel = $100.00

Grand Total Estimated Costs = $5,812.24

FY 2009 Budget Allocations:

Employee Salaries and benefits = $624,039.53
Fixed costs (utilities, fuel, administrative) = $211,415.23
Base maintenance = $50,000
Discretionary Funds (maps, printing, etc.) = $62,243.32
Total Available Funds for FY 2009 = $947,698.08

The financial and staff resources necessary to provide and administer this use at its current level are now available. We expect the resources to continue in the future, subject to availability of appropriated funds.

ANTICIPATED IMPACTS OF USE

The refuge contains approximately 332 acres of managed grassland, which provides important habitat for grassland nesting bird species and other wildlife. All of the grassland units had been hayed and/or grazed in the past prior to acquisition. Many grassland nesting bird species are in decline due to habitat loss, succession, and habitat conversion for cultivation. Haying is one treatment method for managing grassland habitat that is used on national wildlife refuges. Haying has been proven to be a successful and desirable method for habitat management for grassland nesting bird species at Canaan over the past 10 years.

Impacts to Wildlife: Haying involves the use of farm equipment to mow, rake, bale and transport hay in grassland areas. The greatest potential for disturbance to wildlife occurs during mowing. Disturbance varies with vegetation composition and density, habitat use, wildlife species distribution and density, and time of year. Birds, mammals, amphibians and reptiles may be temporarily or permanently displaced, injured, or killed. For nesting birds, cutting will be allowed only after the nesting season for grassland species is complete. This disturbance will be limited to the acreage deemed by the refuge staff to be available for management actions during any given year.

Depending upon bird use and vegetative conditions, the acreage potentially hayed could fluctuate between 0 and 50 percent of the available, refuge-managed grassland habitat annually. Typically 50 percent of the available grasslands will be left unmowed to provide dispersal and migration habitat for landbirds and foraging habitat for migrating and wintering raptor species. Impacts will also be temporary in nature and limited to the number of times equipment is required to enter the field to conduct various phases of the haying operation. Normally this will require four separate instances of equipment working in refuge grassland units. The time required for equipment to conduct necessary operations within the field will depend upon the size of the grassland unit; however, all fields are small enough to require only one visit per activity.

Since haying will occur in mid- to late August, after the nesting season, there will be minimal impacts to grassland birds. Peak nesting activity in Canaan grasslands takes place between late May and mid-June. Research conducted on the refuge to document nesting and fledging success in managed grasslands indicated that most grassland obligate birds have completed nesting activities by early August (Warren and Anderson 2005). Recommendations of some grassland management areas indicate that waiting until mid-July for mowing or haying operations is adequate, however, waiting until mid-August will help prevent impacts to double and triple-brooded species at Canaan such as Savannah sparrows and Eastern Meadowlarks (Warren and Anderson 2005). Since bird species have fledged and young mammals are mobile and capable of escaping injury, direct impacts will be minimal. Since haying will primarily occur in dry grassland areas, impacts to wetlands, reptiles, and amphibians will be minimal. This activity poses little additional impact to current grassland management actions by refuge personnel.

Impacts to Vegetation, Soils and Hydrology: If haying operations occur in wet or moist areas, equipment may adversely impact vegetation and soil. However, most grassland management units occur in dry and well-drained soil types and therefore we do not expect major impacts to vegetation, soils or hydrology. The exception is the Freeland tract which has areas of moist soil. Haying operations in wet soil types could have greater impacts to soil compaction and vegetation loss than refuge operations using a brush hog due to the necessity of working the cut field at least twice after cutting the hay. However, no adverse soil or vegetation affects have been noted by refuge staff after any of the previous haying operations over the last 10 years. Typically mid-August and early September, when haying occurs, are some of the driest months of the year. Fields that have been saturated by rain will not be hayed until soil conditions can support the required equipment.

Impacts to Cultural Resources: This use, as described, will not impact cultural resources. No significant ground (soil) disturbance will occur and all areas being considered for this use have been traditionally hayed or otherwise managed as grasslands for generations.

Impacts to Endangered and Threatened Species: The Federally threatened Cheat Mountain salamander occurs in high elevation spruce and mixed spruce-northern hardwood forests and therefore will not be affected by this activity. The endangered Indiana bat has been documented foraging near grassland management units, but this species is more directly associated with the wetlands adjacent to these units. Additionally, haying operations will not occur at night when Indiana Bats are active. There are no known roosting or maternity sites for the Indiana bat on the refuge. If future documentation of these sites occur the refuge will consult with the Service's Ecological Services Office to ensure that haying operations will not adversely affect this species.

PUBLIC REVIEW AND COMMENT

This compatibility determination was distributed as an appendix to the draft Comprehensive Conservation/ Environmental Assessment for a 45-day public review and comment period.

DETERMINATION (CHECK ONE BELOW):

_____ Use is not compatible

__**X**__ Use is compatible with the following stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

—A Special Use Permit issued by the refuge manager will be required for this activity and will include the stipulations below. Additional stipulations may be included depending upon annual conditions of fields and other refuge activities:

—Haying will occur only after field surveys have indicated that no nesting is taking place and all juvenile birds have fledged. Typically this will be after August 15.

—In consideration of being permitted to engage in the activity authorized under this permit at the Canaan Valley refuge, Permittee, being of lawful age, for himself and his personal representative, heirs, and next of kin, hereby releases, waives, and forever discharges the United States of America, its agents and employees, all for the purposes herein referred to as, Releasees, from any and every claim, demand, action or right of action, of whatsoever kind or nature, either in law or in equity, arising from or by reason of any bodily injury or personal injuries known or unknown, death and/or property damage resulting or to result from any injury, which may occur while engaged in the permitted activity, and covenants not to sue the Releasees, for any loss or damages, and any claim or damage therefore, on account of injury to the person or property or resulting in death of the Permittee, whether caused by the negligence of Releasees or otherwise.

—Permittee agrees to indemnify, defend, save and hold harmless the Releasees and each of them from any loss, liability, damage or cost Releasees may incur due to the presence of Permittee in or upon the said property of the United States.

—Haying will only occur in identified treatment areas in grassland units.

—Haying will not occur in wet or moist areas. Operations will be delayed until equipment use will not negatively impact soils or vegetation.

—Cutting and retrieval of hay can only occur during regular refuge hours of operation between one hour before sunrise to one hour after sunset.

—All haying operations including removal of bales must be complete before the beginning of deer archery season to avoid conflicts with hunters.

—Permittee will follow access regulations specified in the special use permit.

—Vegetation and wildlife response will be monitored to determine impacts and evaluate success of the management action

JUSTIFICATION

This use facilitates the management of refuge grassland habitat and is not only a reasonable method, but sometimes is a preferred method of managing grasslands to maintain habitat for some nesting bird species. Limitations on the seasonal timing of haying, number of visits to each location, and specific locations for this

activity will ensure minimal negative effects to wildlife. Impacts would be similar if refuge personnel were required to conduct this management activity. This use relieves refuge staff from these operations while still achieving the management goals of the grassland program. This use was proposed and managed to benefit grassland habitat, so negative effects on this habitat are not expected. Vegetation and grassland bird responses will be monitored to ensure this use remains compatible. If significant impacts are found, or haying operations cease to benefit the resource or become cumbersome administratively, corrective actions will be taken.

Due to the timing of the haying operation, impacts to wildlife will be minimized. Since only a portion of refuge grasslands will be managed in a given year, other grassland habitat will be available for wildlife during these management actions. Overall the impacts to wildlife are considered negligible and the benefits of the management action improve habitat for targeted grassland obligate bird species. As such this activity will not interfere with the refuge's ability to meet the purposes of the Fish and Wildlife Act (1956) to manage, conserve and protect wildlife resources.

One grassland unit does occur on lands acquired under the authority of the Migratory Bird Conservation Act (1929). Stipulations to prevent nest disturbance and provide un-managed grassland for dispersal and migration habitat reduces the impact to migratory birds to the minimum necessary to achieve the management goals of the haying program. Following the stipulations outlined in this compatibility determination, allowing this use will not affect the refuge's ability to meet the purposes established in the Migratory Bird Conservation Act (1929) and, in fact, support the purposes by managing for migratory birds.

Most grassland habitat occurs in dry uplands soils. The Freeland tract is a mixture of upland and wetland soils which vary in their susceptibility to soil compaction and erosion depending upon the saturation of the soils from rainfall. Stipulations to conduct haying reduce soil and erosion impacts by requiring the sites to be dry when the activity is conducted. Because of the location of grassland management units and stipulations to reduce impacts when conditions are wet, this activity will not interfere with the refuge's purpose as established by the Emergency Wetlands Resources Act (1986) to conserve the wetlands of Canaan Valley.

This use supports and contributes directly to the achievement of the purposes of the refuge and the mission of the National Wildlife Refuge System, as required by 50 CFR 29.1, by contributing to the conservation, protection and management of wildlife (migratory birds) on refuge lands. Conducting this activity improves habitat for grassland bird species and does not affect the refuge's establishing purpose to ensure the ecological integrity of Canaan Valley. For these reasons, commercial haying, as identified in this compatibility determination, is not expected to materially interfere with or detract from the mission of the National Wildlife Refuge System or the purposes for which the refuge was established.

SIGNATURE:

Refuge Manager: Kenneth K. Jim /Acting _____ 2/14/2011
(Signature) (Date)

CONCURRENCE:

Regional Chief: Anthony D Léger _____ 02/25/2011
(Signature) (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: 02/25/2021

LITERATURE CITED

United States Fish and Wildlife Service (USFWS). 1979. Final Environmental Impact Statement - Acquisition of lands for the Canaan Valley National Wildlife Refuge, West Virginia. Department of the Interior - U.S. Fish and Wildlife Service.

U.S. Fish and Wildlife Service. 1994. Final Environmental Assessment - Acquisition of lands for the Canaan Valley National Wildlife Refuge, West Virginia. Department of Interior - U.S. Fish and Wildlife Service, Hadley, Massachusetts. 50 pp.

Warren, K.A. and J.T. Anderson. 2005. Grassland songbird nest-site selection and response to mowing in West Virginia. Wildlife Society Bulletin 33(1): 285-292

COMPATIBILITY DETERMINATION

USE

Maintenance and Use of NOAA Weather Station

REFUGE NAME

Canaan Valley National Wildlife Refuge

DATE ESTABLISHED

August 11, 1994

ESTABLISHING AND ACQUISITION AUTHORITY

The establishment of Canaan Valley National Wildlife Refuge (refuge) was first approved in an Environmental Impact Statement (EIS) released on May 30, 1979. However, the U.S. Fish and Wildlife Service (Service) decided to await the outcome of litigation surrounding a proposed storage hydroelectric facility before pursuing any further action. The approval of the refuge was affirmed by the Service in a 1994 Final Environmental Assessment and Finding of No Significant Impact on July 11, 1994, which confirmed the adequacy of the previously approved 1979 EIS. The refuge was officially established when the first tract of land was acquired on August 11, 1994. The Service has acquired lands for the Canaan Valley refuge under the following authorities:

1. Fish and Wildlife Act of 1956 [16 U.S.C. 742f(a)(4)]
2. Emergency Wetlands Resources Act of 1986 [16 U.S.C. 3901b]
3. Migratory Bird Conservation Act of 1929 [16 U.S.C. 715d]

REFUGE PURPOSES

The refuge was established to ensure the ecological integrity of Canaan Valley and the continued availability of its wetland, botanical, and wildlife resources to the citizens of West Virginia and the United States (USFWS 1979, 1994). Additional refuge purposes as derived from the legislative authorities are as follows:

(1) "... for the development, advancement, management, conservation, and protection of fish and wildlife resources..." (Fish and Wildlife Act of 1956; 16 U.S.C. 742f (a)(4));

(2) "... for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions." (Emergency Wetlands Resources Act of 1986; 16 U.S.C. 3901(b)); and,

(3) "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (Migratory Bird Conservation Act of 1929; 16 U.S.C. 715d).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans. National Wildlife Refuge System Improvement Act, 16 U.S.C § 668dd(a)(2).

DESCRIPTION OF PROPOSED USE

(a) What is the use? Is the use a priority public use?
The use is the maintenance and use of an air quality monitoring and research site by the National Oceanic and Atmospheric Administration (NOAA). This is not a priority public use (National Wildlife Refuge System Improvement Act 1997, Public Law 105-57).

(b) Where would the use be conducted?
The use will be conducted on a 0.5 acre portion of the Beall Tract in an upland grassland field.

(c) When would the use be conducted?
The NOAA weather station was installed during FY 2000 on the Beall Tract and is a continuing use.

(d) How would the use be conducted?
The weather station consists of a 10-meter triangular tower used for dry deposition measurements and a wet deposition measurement station consisting of several collectors placed on a platform.

A galvanized shelter approximately 19 feet long, 6.5 feet high, and 6 feet wide used to house instruments and electronic equipment will be maintained. The shelter is buried approximately 4 feet and bermed over. Power is supplied to the shelter via an underground power line from a power pole located adjacent to the Old Timberline Road.

The NOAA administrator currently stationed at the Canaan Valley Institute is responsible for coordinating activities with the refuge manager. The station is visited typically once a day by a NOAA administrator, staff person, or volunteers in order to retrieve data and reset monitoring devices.

(e) Why is this use being proposed?
NOAA requested site access on refuge lands as the site is central in the valley and ideally situated to collect atmospheric data for the area. Additionally, having a stable protected site is important. This use was found compatible in a compatibility determination issued in 2000.

AVAILABILITY OF RESOURCES

The resources necessary to provide and administer this use are available within current and anticipated refuge budgets. Staff time associated with administration of this use is related to assessing the breeding bird use within the Beall tract grassland, coordinating with the NOAA scientist, and monitoring the access and maintenance of the site to ensure stipulations outlined in a Memorandum of Understanding and this compatibility determination are followed.

The program is administered by the deputy refuge manager, resource impacts are monitored by the wildlife biologist, and maintenance and repair operations, when necessary are performed by a heavy equipment operator. Law enforcement when necessary is provided by a refuge officer.

Annual costs associated with the administration of the maintenance and use of the NOAA weather station on the refuge are estimated below:

Bi-annual maintenance of site is coordinated with refuge Equipment Operator:

- WG-10 Equipment Operator for 1 work day = $272.56

Coordination with NOAA and administrative duties:

- GS-11/12 Deputy Refuge Manager for 1 work days = $278.72

Law enforcement, monitoring vehicle travel and interactions with other users, visitor services:

- GS-9 Park Ranger (LE) for 5 work days = $1,228.80

Monitoring environmental effects:

- GS-12 Wildlife Biologist for 1 work days (surveys and analysis) = $367.50
- GS-7 Biological Technician for 2 work days (surveys and analysis)=$401.76

Providing information to the public

- GS-11 Park Ranger for 1 work days = $353.04

Vehicle Fuel = $50.00

Grand Total Estimated Costs =$2,952.38

FY 2009 Budget Allocations:

Employee Salaries and benefits = $624,039.53
Fixed costs (utilities, fuel, administrative) = $211,415Base maintenance = $50,000
Discretionary Funds (maps, printing, etc.) = $62,243.32
Total Available Funds for FY 2009 = $947,698.08

The financial and staff resources necessary to provide and administer this use at its current level are now available. We expect the resources to continue in the future, subject to availability of appropriated funds.

ANTICIPATED IMPACTS OF THE USE

The site is located on grassland habitat located on the Beall Tract. In the early 1900's the site was logged, burned, graded, and converted for crop production and later used for hay production and grazing. Vehicle access to the site for the purpose of maintenance is limited to late fall/early winter in order to avoid disturbance to birds and other animals during breeding season. Because of the limited vehicle access and the time of year when vehicle access occurs, we do not anticipate adverse impacts from this use on threatened and endangered species, or on any other wildlife that use this habitat.

Disturbance to the site is limited because it is mostly accessed by foot, once a day by one person. Therefore we do not anticipate any adverse impacts to soils, vegetation, or hydrology because of the infrequency of use and the limited number of people accessing the site.

Since the installation of equipment and use of the facility by NOAA in 2000, breeding bird surveys have been conducted in the Beall grassland. Results indicate that aside from the immediate loss of habitat from the structures themselves, bird use of the area has remained steady and consistent. Banding research conducted collaboratively with the U.S. Forest Service Experimental Forest Research Unit has found that grasshopper sparrows are returning to the same area of the field each year. Breeding density has not changed significantly and in fact recent grassland management has encouraged use by Henslow's sparrows, a rare grassland obligate breeder. These facts indicate that under current conditions and use the NOAA weather station does not significantly affect the grassland management program or use of the grassland by migratory birds.

A consultation with regional archeologists John Wilson was completed and no impacts to archeological or historical sites are anticipated.

PUBLIC REVIEW AND COMMENT

This compatibility determination was released concurrent with the draft Comprehensive Conservation Plan/ Environmental Assessment for a 45-day public review and comment period.

DETERMINATION (CHECK ONE BELOW):

_____ Use is not compatible

__**X**__ Use is compatible with the following stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

— To prevent migratory bird collisions, no lights will be placed on the tower.

— Wet and dry deposition equipment will be strategically located to avoid aesthetic impacts.

— Daily site access will be by foot only.

— Occasional vehicle access is permitted for the purpose of maintenance and is limited to late fall/early winter.

— No new structures shall be permitted at the site. Instruments, antenna, and other devices that are or can be affixed to existing infrastructure will be permitted following review by refuge manager.

— Refuge requires an annual report submitted to the refuge manager detailing the information collected at the weather station. Information should include monthly summaries of measurements taken (i.e., monthly rainfall, precipitation acidity, temperatures etc.).

— A Memorandum of Understanding was established to fulfill the agreements between the Service and NOAA. This agreement will be updated as necessary to ensure the activity remains compatible with refuge purposes.

JUSTIFICATION

The maintenance of the NOAA air quality monitoring and research site will result in negligible impacts to wildlife and will provide important climate data. This information will be useful in determining the impacts of air and waterborne pollutants on the ecological communities in Canaan Valley and the mid-Atlantic Highlands and will likely be important as the refuge addresses climate change impacts to refuge habitats. Information generated by the NOAA research station has been useful for reports generated by the refuge and other research partners requiring comprehensive atmospheric data.

To protect sensitive species, maintenance operations requiring vehicle access are limited to late fall/early winter, avoiding disturbance during breeding season. Disturbance to the site is limited to foot traffic and the site is typically accessed only once per day by one person. Monitoring data on area bird populations has shown no changes in breeding density or habitat use associated with this activity. In addition, the refuge has established a Memorandum of Understanding with NOAA to ensure wildlife species and their habitat are protected.

Because of the limited access and restrictions on maintenance operations this use will not affect the refuge's ability to protect, conserve and manage wildlife and their habitats (grassland species) as directed by the Fish and Wildlife Act (1956) and the mission of the National Wildlife Refuge System. This site is not located on tracts purchased under the authority of the Migratory Bird Conservation Act (1929) therefore the refuge will not be affected in meeting its mandates to conserve and manage for migratory birds on these tracts. The location of the site is an upland grassland field which prevents impacts to wetland resources. Therefore this use will not affect the refuge's purpose to conserve the wetlands of Canaan Valley as directed by the Emergency Wetland Resources Act. The establishing purpose of the refuge to protect the ecological integrity of Canaan Valley will not be affected by the minimal maintenance and access required to continue the NOAA operation on the Beall Tract. For these reasons, we have determined that this activity will not materially interfere with or detract from fulfilling the refuge purposes and the National Wildlife Refuge System mission.

SIGNATURE:

Refuge Manager: _____ (Signature) _____ (Date)

CONCURRENCE:

Regional Chief: _____ (Signature) _____ (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: _____

LITERATURE CITED

United States Fish and Wildlife Service (USFWS). 1979. Final Environmental Impact Statement - Acquisition of lands for the Canaan Valley National Wildlife Refuge, West Virginia. Department of the Interior - U.S. Fish and Wildlife Service.

U.S. Fish and Wildlife Service. 1994. Final Environmental Assessment - Acquisition of lands for the Canaan Valley National Wildlife Refuge, West Virginia. Department of Interior - U.S. Fish and Wildlife Service, Hadley, Massachusetts. 50 pp.

COMPATIBILITY DETERMINATION

USE

Research Conducted by Non-Service Personnel

REFUGE NAME

Canaan Valley National Wildlife Refuge

DATE ESTABLISHED

August 11, 1994

ESTABLISHING AND ACQUISITION AUTHORITY

The establishment of Canaan Valley National Wildlife Refuge (refuge) was first approved in an Environmental Impact Statement (EIS) released on May 30, 1979. However, the U.S. Fish and Wildlife Service (Service) decided to await the outcome of litigation surrounding a proposed storage hydroelectric facility before pursuing any further action. The approval of the refuge was affirmed by the Service in a 1994 Final Environmental Assessment and Finding of No Significant Impact on July 11, 1994, which confirmed the adequacy of the previously approved 1979 EIS. The refuge was officially established when the first tract of land was acquired on August 11, 1994. The Service has acquired lands for the Canaan Valley refuge under the following authorities:

1. Fish and Wildlife Act of 1956 [16 U.S.C. 742f(a)(4)]
2. Emergency Wetlands Resources Act of 1986 [16 U.S.C. 3901b]
3. Migratory Bird Conservation Act of 1929 [16 U.S.C. 715d]

REFUGE PURPOSES

The refuge was established to ensure the ecological integrity of Canaan Valley and the continued availability of its wetland, botanical, and wildlife resources to the citizens of West Virginia and the United States (USFWS 1979, 1994). Additional refuge purposes as derived from the legislative authorities are as follows:

(1) "... for the development, advancement, management, conservation, and protection of fish and wildlife resources..." (Fish and Wildlife Act of 1956; 16 U.S.C. 742f (a)(4));

(2) "... for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions." (Emergency Wetlands Resources Act of 1986; 16 U.S.C. 3901(b)); and,

(3) "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (Migratory Bird Conservation Act of 1929; 16 U.S.C. 715d).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

[T]o administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans. National Wildlife Refuge System Improvement Act, 16 U.S.C § 668dd (a)(2).

DESCRIPTION OF USE

(a) What is the use? Is the use a priority public use?
The use is research conducted by non-Service personnel. Research conducted by non-Service personnel is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

(b) Where would the use be conducted?
The location of the research will vary depending on the individual research project that is being conducted. The entire refuge may be made available for scientific research. An individual research project is usually limited to a particular habitat type, plant, or wildlife species. On occasion research projects will encompass an assemblage of habitat types, plants, or wildlife, or may span more than one refuge or include lands outside the refuge. The research location will be limited to those areas of the refuge that are absolutely necessary to conduct the research project. The refuge may limit areas available to research as necessary to ensure the protection of trust resources or reduce conflict with other compatible refuge uses. Access to study locations will be identified by refuge staff.

(c) When would the use be conducted?
The timing of the research will depend entirely on the individual research project's approved design. Scientific research will be allowed to occur on the refuge throughout the year. An individual research project could be short term in design, requiring one or two visits over the course of a few days. Other research projects could be multiple year studies that require daily visits to the study site. The timing of each individual research project will be limited to the minimum required to complete the project. If a research project occurs during the refuge hunting season, special precautions will be required and enforced to ensure the researchers' health and safety and so that conflicts with a priority public use (hunting) will be minimized or eliminated.

(d) How would the use be conducted?
The methods of the research will depend entirely on the individual research project that is conducted. The methods of each research project will be reviewed and scrutinized before it will be allowed to occur on the refuge. No research project will be allowed to occur if it does not have an approved scientific method, if it negatively impacts endangered species, migratory birds, other refuge trust resources, or if it compromises public health and safety. A research proposal form will be distributed to parties interested in conducting research on the refuge.

(e) Why is this use being proposed?
Research by non-Service personnel is conducted by colleges, universities, Federal, State, and local agencies, non-governmental organizations, and qualified members of the general public to further the understanding of the natural environment and to improve the management of the refuge's natural resources. Much of the information generated by the research is applicable to management on and near the refuge. In many cases research by non-Service personnel ensures the perception of un-biased and objective information gathering which can be important when using the research to develop management recommendations for politically sensitive issues. Additionally, universities and other Federal partners can access equipment and facilities unavailable to refuge staff for analysis of data or biological samples.

The Service will encourage and support research and management studies on refuge lands that will improve and strengthen natural resource management decisions. The refuge manager will encourage and seek research relative to approved refuge objectives that clearly improves land management and promotes adaptive management. Priority research addresses information that will better manage the nation's biological resources and is generally considered important to: agencies of the Department of Interior; the Service; the National Wildlife Refuge System; and State fish and game agencies, and that addresses important management issues or demonstrates techniques for management of species and/or habitats.

The refuge will also consider research for other purposes which may not be directly related to refuge-specific objectives, but contribute to the broader enhancement, protection, use, preservation, and management of native populations of fish, wildlife and plants, and their natural diversity within the region or flyway.

The refuge will maintain a list of research needs that will be provided to prospective researchers or organizations upon request. Refuge support of research directly related to refuge objectives may take the form of funding, in-kind services such as housing or use of other facilities, direct staff assistance with the project in the form of data collection, provision of historical records, conducting management treatments, or other assistance as appropriate.

AVAILABILITY OF RESOURCES

The bulk of the cost for research is incurred in staff time to review research proposals, coordinate with researchers and write special use permits (SUP). In some cases, a research project may only require one day of staff time to write a SUP. In other cases, a research project may take an accumulation of weeks, as the refuge biologist must coordinate with students and advisors and accompany researchers on site visits. Because research conducted on the refuge is not constant, there may be fiscal years when little if any time is spent on managing outside research projects by refuge staff. However, over the last 10 years the refuge has typically hosted at least one outside research project on the refuge requiring an estimated three weeks of staff time support. This support includes review of the proposal by the refuge manager and biologist, consultation and coordination with principal researcher and field staff, issuance of SUP, review of progress reports and other daily operational communications.

Annual costs associated with the administration of permitting research by non-service personnel are estimated below:

Refuge Manager (GS 13): Review of research proposals, administration and consultation with refuge staff – 5 days = $1,360.00

Refuge Biologist (GS-12): Review of research proposals, administrative work, coordination with principal researcher and field crew, project monitoring and review – 2 weeks = $2,433.00

Refuge Biologist (GS-11): Administrative work, technical assistance, and support products – 5 days = $960.00

Equipment Operator (WG-10): Maintenance of housing facilities, coordination with field crew – 5 days $1,362.80

Grand Total Estimated Costs = $18,355.80

FY 2009 Budget Allocations:

Employee Salaries and benefits = $624,039.53
Fixed costs (utilities, fuel, administrative) = $211,415.23
Base maintenance = $50,000
Discretionary Funds (maps, printing, etc.) = $62,243.32
Total Available Funds for FY 2009 = $947,698.08

Based on existing refuge expenditures for habitat management, funding is adequate to ensure compatibility and to administer and manage the subject use.

ANTICIPATED IMPACTS OF THE USE

The Service encourages approved research to further the understanding of natural resources. Research by other than Service personnel adds greatly to the information base for refuge managers to make proper decisions. Disturbance to wildlife and vegetation by researchers could occur through observation, mist-netting, banding, and accessing the study area by foot or vehicle. Mist-netting or other wildlife capture techniques, for example, can cause direct mortality through the capture method or in trap predation, and indirectly through capture injury or stress caused to the organism. Plant collection can also cause direct mortality of the target plant and can cause indirect mortality through the collection process.

Project-specific stipulations outlined in each SUP will act to minimize anticipated impacts of research projects. These stipulations will prevent impacts to wetlands, water quality, soils, and hydrology, or actions which would significantly affect fish, wildlife or habitat that the refuge was established to protect. Projects which occur within the habitat of, or include direct monitoring of, threatened and endangered species will be subject to a Section 7 informal consultation with the Service's West Virginia Field Office under the Endangered Species Act (87 Stat. 854, as amended; 16 U.S.C. 1531 et. seq). Only with the approval of the Section 7 consultation will the refuge permit research to be conducted on habitats or individuals of threatened and endangered species. Research that could adversely affect critical habitat or threatened and endangered wildlife will not be permitted.

The potential for user conflicts is minimal with research projects conducted on the refuge. Generally, most research occurs within closed areas and away from public use trails and facilities. During hunting seasons, hunters may encounter researchers in the field, or observe monitoring plots or other research infrastructure. However, these encounters will be infrequent due to the typically minimal presence of field technicians and interest in maintaining low profile infrastructure to prevent disturbance or vandalism of study sites.

Overall, allowing well designed and properly reviewed research to be conducted by non-Service personnel is likely to have very little impact on refuge wildlife populations or plant communities. If the research project is conducted with professionalism and integrity, potential adverse impacts are likely to be outweighed by the knowledge gained about a species, habitat or public use. Additionally, researchers are regularly required to present information to the public as a condition of the SUP issued by the refuge. This information can be a public presentation of field work, interpretive programs, and other materials detailing the research project and results. This is beneficial because it provides an opportunity for the public to understand and learn about the biological resources the refuge protects and manages.

PUBLIC REVIEW AND COMMENT

This compatibility determination was released concurrent with the draft Comprehensive Conservation Plan/ Environmental Assessment for a 45-day public review and comment period.

DETERMINATION (CHECK ONE BELOW):

_____ Use is not compatible

__**X**__ Use is compatible with the following stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

All researchers will be required to submit a detailed research proposal following Service policy (Service Refuge Manual Chapter 4 Section 6). The refuge must be given at least 45 days to review proposals before initiation of research. If collection of wildlife is involved, the refuge must be given 60 days to review and decide whether to approve the proposal. Proposals will be prioritized and approved based on need, benefit, compatibility, and funding required. The decision whether to approve any research proposal will be at the sole discretion of the refuge manager.

—SUPs will be issued for all research conducted by non-Service personnel. The SUP will list all conditions that are necessary to ensure compatibility. The SUP will also identify a schedule for annual progress reports and the submittal of a final report or scientific paper. The regional refuge biologists, other Service divisions, and State agencies may be asked to review and comment on proposals.

—All researchers will be required to obtain appropriate State and Federal permits.

—All research projects will be designed to avoid significant impacts to hydrology, water quality, and soils.

—All research related SUPs will contain a statement regarding the Service's policy regarding disposition of biotic specimens. The current Service policy language in this regard (USFWS 1999) is,

> *"You may use specimens collected under this permit, any components of any specimens (including natural organisms, enzymes, genetic material or seeds), and research results derived from collected specimens for scientific or educational purposes only, and not for commercial purposes unless you have entered into a Cooperative Research and Development Agreement (CRADA) with us. We prohibit the sale of collected research specimens or other transfers to third parties. Breach of any of the terms of this permit will be grounds for revocation of this permit and denial of future permits. Furthermore, if you sell or otherwise transfer collected specimens, any components thereof, or any products or any research results developed from such specimens or their components without a CRADA, you will pay us a royalty rate of 20 percent of gross revenue from such sales. In addition to such royalty, we may seek other damages and injunctive relief against you."*

—Any research project may be terminated at any time for non-compliance with the SUP conditions, or modified, redesigned, relocated or terminated upon determination by the refuge manager that the project is causing unanticipated adverse impacts to wildlife, wildlife habitat, approved priority public uses, or other refuge management activities.

—In consideration of being permitted to engage in the activity authorized under this permit at the Canaan Valley refuge, Permittee, being of lawful age, for himself and his personal representative, heirs, and next of kin, hereby releases, waives, and forever discharges the United States of America, its agents and employees, all for the purposes herein referred to as, Releasees, from any and every claim, demand, action or right of action, of whatsoever kind or nature, either in law or in equity, arising from or by reason of any bodily injury or personal injuries known or unknown, death and/or property damage resulting or to result from any injury, which may occur while engaged in the permitted activity, and covenants not to sue the Releasees, for any loss or damages, and any claim or damage therefore, on account of injury to the person or property or resulting in death of the Permittee, whether caused by the negligence of Releasees or otherwise.

JUSTIFICATION

The Service encourages approved research to further understanding of refuge natural resources. Research by non-Service personnel adds greatly to the information base for refuge managers to make proper decisions. To protect habitat and wildlife, researchers are required to submit detailed research proposals. Proposals are reviewed and must be approved by refuge staff prior to implementation. In addition to the stipulations above, project-specific stipulations outlined in each SUP will act to minimize anticipated impacts of research projects. Projects which occur within the habitat of, or include direct monitoring of threatened and endangered species will be subject to an Intra-Service Section 7 consultation. Only with the approval of the Section 7 consultation will the refuge permit research to be conducted on habitats or individuals of threatened and endangered species. With the restrictions and approval process required to permit research activities this use will not prevent the refuge from meeting its purposes established by the Fish and Wildlife Act (1956) and the Emergency Wetlands Resources Act (1986) of ensuring the protection, conservation, management and restoration of the wetlands of Canaan Valley, or for the management and conservation of wildlife or their habitats. Stipulations will be designed to prevent impacts to migratory birds to ensure the refuge meets its obligations under the Migratory Bird Conservation Act (1929). In most cases the research will help guide refuge management to meet its purposes more effectively. For these reasons, we have determined that research conducted by non-Service personnel will not materially interfere with or detract from the mission of the National Wildlife Refuge System or the purposes for which the refuge was established.

SIGNATURE:

Refuge Manager: Kenneth K. Stone /Acting _____ 2/14/2011 _____
(Signature) (Date)

CONCURRENCE:

Regional Chief: Anthony D Lege _____ 02/25/2011 _____
(Signature) (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: 02/25/2021

LITERATURE CITED

United States Fish and Wildlife Service (USFWS). 1979. Final Environmental Impact Statement - Acquisition of lands for the Canaan Valley National Wildlife Refuge, West Virginia. Department of the Interior - U.S. Fish and Wildlife Service.

U.S. Fish and Wildlife Service. 1994. Final Environmental Assessment - Acquisition of lands for the Canaan Valley National Wildlife Refuge, West Virginia. Department of Interior - U.S. Fish and Wildlife Service, Hadley, Massachusetts. 50 pp.

U.S. Fish and Wildlife Service. 1999. Director's Order No. 109: Use of Specimens Collected on Fish and Wildlife Lands. March 30, 1999.

COMPATIBILITY DETERMINATION

USE

Maintenance of a Utility Right-of-Way

REFUGE NAME

Canaan Valley National Wildlife Refuge

DATE ESTABLISHED

August 11, 1994

ESTABLISHING AND ACQUISITION AUTHORITY

The establishment of Canaan Valley National Wildlife Refuge (refuge) was first approved in an Environmental Impact Statement (EIS) released on May 30, 1979. However, the U.S. Fish and Wildlife Service (Service) decided to await the outcome of litigation surrounding a proposed storage hydroelectric facility before pursuing any further action. The approval of the refuge was affirmed by the Service in a 1994 Final Environmental Assessment and Finding of No Significant Impact on July 11, 1994, which confirmed the adequacy of the previously approved 1979 EIS. The refuge was officially established when the first tract of land was acquired on August 11, 1994. The Service has acquired lands for the Canaan Valley refuge under the following authorities:

1. Fish and Wildlife Act of 1956 [16 U.S.C. 742f (a)(4)]
2. Emergency Wetlands Resources Act of 1986 [16 U.S.C. 3901b]
3. Migratory Bird Conservation Act of 1929 [16 U.S.C. 715d]

REFUGE PURPOSES

The refuge was established to ensure the ecological integrity of Canaan Valley and the continued availability of its wetland, botanical, and wildlife resources to the citizens of West Virginia and the United States (USFWS 1979, 1994). Additional refuge purposes as derived from the legislative authorities are as follows:

(1) "... for the development, advancement, management, conservation, and protection of fish and wildlife resources..." (Fish and Wildlife Act of 1956; 16 U.S.C. 742f (a)(4));

(2) "... for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions." (Emergency Wetlands Resources Act of 1986; 16 U.S.C. 3901(b)); and,

(3) "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (Migratory Bird Conservation Act of 1929; 16 U.S.C. 715d).

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

"To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans."

DESCRIPTION OF PROPOSED USE

(a) What is the use? Is the use a priority public use?
The use is the maintenance of a utility right-of-way (ROW) granted to Allegheny Power Company of Elkins, West Virginia in 2004 to accommodate a buried electric line from an existing electric pole on refuge land to a private residence adjacent to refuge land. The maintenance is necessary to ensure the buried electric cable remains functional. This use is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

(b) Where would the use be conducted?
The use occurs between the end of an existing utility easement on the south east corner of the Cooper tract (Tract 49) and the southern refuge boundary. This extension extends approximately 50 feet from the existing utility easement and will accommodate a buried power line extending from an existing power pole to the refuge boundary and continuing on private land.

(c) When would the use be conducted?
The use is conducted by Allegheny Power on a periodic basis to inspect and maintain utility lines.

(d) How would the use be conducted?
The use is conducted by employees of Allegheny Power during scheduled and un-scheduled maintenance and monitoring visits. The use involves utility trucks traversing an existing refuge road to the site of a utility pole where a power line extends approximately 50 feet underground across refuge land to a private residence located adjacent to the refuge boundary.

(e) Why is this use being proposed?
This use is being proposed to allow a local power company to maintain electric power across a short distance of refuge land. The alternative would be allowing the power line to deteriorate to an unsafe condition or cancelling the refuge's 2004 ROW agreement and removing the power line.

AVAILABILITY OF RESOURCES

The program is administered by the deputy refuge manager, resource impacts are monitored by the wildlife biologist, and maintenance and repair operations, when necessary are performed by a heavy equipment operator. Law enforcement when necessary is provided by a refuge officer.

Because vehicle access to the site is only necessary for monitoring and maintenance and these activities are only conducted irregularly it is expected that these costs will not be annual but sporadic. Assuming access is required, annual costs associated with the administration of vehicular access on the refuge are estimated below:

Coordination and administrative duties:

- GS-11/12 Deputy Refuge Manager for 1 work day = $278.72

Law enforcement, monitoring vehicle travel and interactions with other users, visitor services:

- GS-9 Park Ranger for 1 work day = $245.76

Monitoring environmental effects:

- GS-12 Wildlife Biologist for 1/2 work day = $183.76

Costs associated with the maintenance and monitoring of this utility ROW will be the responsibility of the applicant, not the Service. According to Service regulations (50 CFR 29.21-2(a)(3)(i) the entity who requests a ROW must "reimburse the United States for reasonable costs incurred by the Fish and Wildlife Service in monitoring the construction, operation, maintenance, and termination of facilities within or adjacent to the permit area." Because we will recover the costs of managing this use from the permittee Allegheny Power, resources are available to ensure that this use will remain compatible.

ANTICIPATED IMPACTS OF THE USE

This use will require periodic monitoring and maintenance of approximately a 50-foot strip across refuge land by Allegheny Power personnel. Regular maintenance and monitoring are not required for underground electric lines. Maintenance activities would be largely a result of emergency situations to repair damages and to minimize risk of failure through removal of woody vegetation. Any mowing or woody vegetation removal will only occur along the 50-foot length of the buried line, therefore concentrating the zone of disturbance to a small area. Therefore we do not anticipate adverse impacts to soils, vegetation or hydrology from vehicle or foot traffic. We also do not anticipate any impacts to wildlife, including threatened or endangered species, because the site requires so little maintenance, therefore minimizing the potential for wildlife disturbance.

This area is currently part of a refuge grassland unit which is mowed on a 3-5 year basis. As a result, no woody vegetation is permitted to become established. This tract is also planned to be under grassland management for the next 15 years based on recommendations in the refuge Comprehensive Conservation Plan. The small impact area will not affect grassland management capability or wildlife habitat. There will be no impacts to general public or to public safety. The site of the power line (buried cable) is in an area that is closed to public access for most of the year. The area is open to hunters during the State hunting season. The site of the cable is within 50 feet of a home and is closed to hunting by State law. Hunting is not allowed within 500 feet of an occupied residence. No impacts from hunting activity or on hunting activity are anticipated.

PUBLIC REVIEW AND COMMENT

This compatibility determination was released concurrent with the draft Comprehensive Conservation Plan/ Environmental Assessment for a 45-day public review and comment period.

DETERMINATION (CHECK ONE BELOW):

_____ Use is not compatible

__**X**__ Use is compatible with the following stipulations

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

Allegheny Power will contact the refuge manager prior to accessing the site. If emergency conditions occur during times when contact with the refuge manager is not feasible, Allegheny Power will contact the refuge manager as soon as practical. No maintenance activities will be permitted during the breeding season of migratory birds, typically from late May through the middle of August.

JUSTIFICATION

Approximately 150 square feet of refuge land will be affected. The site will be accessed via an existing refuge road. The activity occurs in habitat that is already periodically mowed and maintained as grassland habitat, so no long-term changes to the habitat are expected.

This use was determined to be compatible in 2004. The continued maintenance of this 50 foot ROW is compatible provided the stipulations are implemented. Additionally, the area is currently being actively managed as grassland and will continue to be managed as such, as indicated in the refuge Comprehensive Conservation Plan. Therefore required maintenance for this ROW is being performed by the refuge in accordance with the grassland management program. Permitting this use is not anticipated to significantly reduce the quality or quantity or fragment habitats now or in future years. The amount of habitat disturbance is inconsequential to the amount of similar habitat which remains protected. The use will not impose significant adverse effects on refuge resources, including the ability of the refuge to conserve and protect the wetlands of Canaan Valley as directed by the Emergency Wetland Resources Act (1986) or to conserve, manage and protect wildlife, plants and habitats as designated by the Fish and Wildlife Act (1956).The use does not occur on lands acquired under the Migratory Bird Conservation Act (1929). It will not interfere with public use of the refuge, nor will it cause an undue administrative burden. Because of the small scale of this use, and the fact that the land is already being managed to prevent woody encroachment and stipulations specified above, the use will not affect the refuge's ability to protect the ecological integrity of Canaan Valley as described in the 1979 EIS for the establishment of the refuge. This use will not materially interfere with or detract from the mission of the National Wildlife Refuge System nor diminish from the purposes for which the refuge was established.

SIGNATURE:

Refuge Manager: Kenneth K. Stein Acting _____ 2/14/2011 _____
(Signature) (Date)

CONCURRENCE:

Regional Chief: Anthony D Sago _____ 02/25/2011 _____
(Signature) (Date)

MANDATORY 10 YEAR RE-EVALUATION DATE: 02/25/2021

LITERATURE CITED

United States Fish and Wildlife Service (USFWS). 1979. Final Environmental Impact Statement - Acquisition of lands for the Canaan Valley National Wildlife Refuge, West Virginia. Department of the Interior - U.S. Fish and Wildlife Service.

U.S. Fish and Wildlife Service. 1994. Final Environmental Assessment - Acquisition of lands for the Canaan Valley National Wildlife Refuge, West Virginia. Department of Interior - U.S. Fish and Wildlife Service, Hadley, Massachusetts. 50 pp.

Appendix C

Kent Mason

Canaan Valley Main Tract and Dolly Sods Wilderness Area

Wilderness Review

- **Introduction**
- **Phase I – Wilderness Inventory**
- **Summary of Wilderness Inventory Findings**

Introduction

The purpose of a wilderness review is to identify and recommend to Congress lands and waters of the National Wildlife Refuge System (Refuge System) that merit inclusion in the National Wilderness Preservation System (NWPS). Wilderness reviews are required elements of comprehensive conservation plans, are conducted in accordance with the refuge planning process outlined in the Fish and Wildlife Service Manual (602 FW 1 and 3), and include compliance with the National Environmental Policy Act (NEPA) and public involvement.

The wilderness review process has three phases: inventory; study; and, recommendation. Lands and waters that meet the minimum criteria for wilderness are identified in the inventory phase. These areas are called wilderness study areas (WSAs). In the study phase, a range of management alternatives are evaluated to determine if a WSA is suitable for wilderness designation or management under an alternate set of goals and objectives that do not involve wilderness designation.

The recommendation phase consists of forwarding or reporting the suitable recommendations from the Director of the U.S. Fish and Wildlife Service (Service) through the Secretary of the Interior and the President to Congress in a wilderness study report. The wilderness study report is prepared after the record of decision for the final Comprehensive Conservation Plan (CCP) has been signed. Areas recommended for designation are managed to maintain wilderness character in accordance with management goals, objectives, and strategies outlined in the final CCP until Congress makes a decision or the CCP is amended to modify or remove the wilderness proposal.

Canaan Valley National Wildlife Refuge (refuge) personnel, listed at the end of this appendix, met in 2007 to gather information and conduct an inventory of the refuge's lands and waters. Wilderness inventory areas (WIA) are bounded by roads that are suitable for public travel. After dividing the refuge into suitable WIAs, the team used site knowledge, existing land status maps, photographs, available land use information and road inventory data to determine if each inventory area met the minimum criteria for wilderness. Aerial photographs were used to document the imprint of human work, road locations, and other surface disturbances.

Phase I – Wilderness Inventory

Introduction

The wilderness inventory is a broad look at each planning area to identify WSAs. A WSA is an area of undeveloped Federal land that retains its primeval character and influence, without permanent improvements or human habitation, and further, meets the minimum criteria for wilderness as identified in Section 2(c) of the Wilderness Act.

Minimum Wilderness Criteria

A WSA is required to be a roadless area or an island of any size, meet the size criteria, appear natural, and provide for solitude or primitive recreation.

Roadless — Roadless refers to the absence of improved roads suitable and maintained for public travel by means of motorized vehicles primarily intended for highway use. A route maintained solely by the passage of vehicles does not constitute a road. Only Federal lands are eligible to be considered for wilderness designation and inclusion within the NWPS.

The following factors were the primary considerations in evaluating the roadless criteria.

A. The area does not contain improved roads suitable and maintained for public travel by means of motorized vehicles primarily intended for highway use.

B. The area is an island, or contains an island that does not have improved roads suitable and maintained for public travel by means of motorized vehicles primarily intended for highway use.

C. The area is in Federal fee title ownership.

(1) Size— The size criteria can be satisfied if an area has at least 5,000 acres of contiguous roadless public land, or is sufficiently large that its preservation and use in an unimpaired condition is practicable.

The following factors were the primary considerations in evaluating the size criteria.

A. An area of more than 5,000 contiguous acres. State and private lands are not included in making this acreage determination.

B. A roadless island of any size. A roadless island is defined as an area surrounded by permanent waters or that is markedly distinguished from the surrounding lands by topographical or ecological features.

C. An area of less than 5,000 contiguous Federal acres that is of sufficient size as to make practicable its preservation and use in an unimpaired condition, and of a size suitable for wilderness management.

D. An area of less than 5,000 contiguous acres that is contiguous with a designated wilderness, recommended wilderness, or area under wilderness review by another Federal wilderness managing agency such as the U.S. Forest Service, National Park Service, or Bureau of Land Management.

(2) Naturalness — The Wilderness Act, Section 2(c), defines wilderness as an area that "generally appears to have been affected primarily by the forces of nature with the imprint of human work substantially unnoticeable." The area must appear natural to the average visitor, rather than "pristine." The presence of historic landscape conditions is not required.

An area may include some human impacts provided they are substantially unnoticeable in the unit as a whole. Significant hazards caused by humans, such as the presence of unexploded ordnance from military activity and the physical impacts of refuge management facilities and activities are also considered in evaluating the naturalness criteria.

An area may not be considered unnatural in appearance solely on the basis of the sights and sounds of human impacts and activities outside the boundary of the unit. The cumulative effects of these factors in conjunction with land base size, physiographic and vegetative characteristics were considered in the evaluation of naturalness.

The following factors were the primary considerations in evaluating naturalness.

A. The area appears to have been affected primarily by the forces of nature with the imprint of human work substantially unnoticeable.

B. The area may include some human impacts provided they are substantially unnoticeable in the unit as a whole.

C. Does the area contain significant hazards caused by humans, such as the presence of unexploded ordnance from military activity?

D. The presence of physical impacts of refuge management facilities and activities.

(3a and 3b) Solitude or Primitive and Unconfined Recreation —A WSA must provide outstanding opportunities for solitude or primitive and unconfined recreation. The area does not have to possess outstanding opportunities for both solitude and primitive and unconfined recreation, and does not need to have outstanding opportunities on every acre. Further, an area does not have to be open to public use and access to qualify under this criteria; Congress has designated a number of wilderness areas in the Refuge System that are closed to public access to protect resource values.

Opportunities for solitude refer to the ability of a visitor to be alone and secluded from other visitors in the area. Primitive and unconfined recreation means non-motorized, dispersed outdoor recreation activities that

are compatible and do not require developed facilities or mechanical transport. These primitive recreation activities may provide opportunities to experience challenge and risk, self reliance, and adventure. These two elements are not well defined by the Wilderness Act, but can be expected to occur together in most cases. However, an outstanding opportunity for solitude may be present in an area offering only limited primitive recreation potential. Conversely, an area may be so attractive for recreation use that experiencing solitude is not an option.

The following factors were the primary considerations in evaluating outstanding opportunities for solitude or primitive unconfined recreation.

A. The area offers the opportunity to avoid the sights, sounds and evidence of other people. A visitor to the area should be able to feel alone or isolated.

B. The area offers non-motorized, dispersed outdoor recreation activities that are compatible and do not require developed facilities or mechanical transport.

(4) Supplemental Values— The Wilderness Act states that an area of wilderness may contain ecological, geological, or other features of scientific, educational, scenic or historical value. Supplemental values of the area are optional, but the degree to which their presence enhances the area's suitability for wilderness designation should be considered. The evaluation should be based on an assessment of the estimated abundance or importance of each of the features.

Summary of Wilderness Inventory Findings

The wilderness inventory team identified 14 WIAs within the approved acquisition boundary of the Canaan Valley refuge (map C-1). The inventory phase to evaluate tracts that would qualify as WSA's used the minimum criteria established to support wilderness. As such major factors that would reduce an area's suitability for wilderness consideration were used as dividing lines for WIA boundary delineation. The majority of these boundaries were drawn following public or refuge roads which are suitable or are currently used for public travel. Other divisions were formed by the presence of maintained gas pipeline right of ways, a major visible break in forest cover and are mowed to prevent woody encroachment. Roads and maintained gas pipelines were considered to break the criteria for naturalness (i.e. the works of humans being substantially unnoticeable to the average visitor). We determined that WIAs 7 and 10 meet the necessary criteria for a WSA. The other 12 WIAs in the Canaan Valley refuge either did not meet the size criteria or did not meet one of the other necessary criteria for designation as a WSA. Therefore, the suitability of the lands listed in Table C-1 (below) that did not meet the necessary criteria was not further analyzed for wilderness designation in the draft Comprehensive Plan/Environmental Assessment (draft CCP/EA).

Wilderness Inventory Conclusion

In this final CCP, we have completed the inventory phase of the wilderness review process and have established two WSAs. While WIAs 7 and 10 qualify as WSAs, the planning team has decided that it needs more time to pursue the wilderness review process for these WIAs. Both these areas were purchased from the same owner and they have similar issues related to property encumbrances. In general, we have concerns about Service jurisdiction and management capability for these areas. More specifically, we need a better understanding of how the many reserved rights, rights-of-way, leases, and other agreements (up to 37 in and around WIA 7 alone) would affect wilderness designation. Based on informal guidance developed at the National Wildlife System Planning Chief's meeting in July 2007 in Arlington, Virginia, we will prepare an amendment to the CCP after we evaluate the suitability of these WSAs for wilderness designation. We will complete the wilderness review process within 3 years of approval of the final CCP. During that time, we will manage the WSAs to maintain their size, naturalness, and outstanding opportunities for solitude or primitive recreation to the extent that it will not prevent us from fulfilling and carrying out refuge establishing purposes and the Refuge System mission.

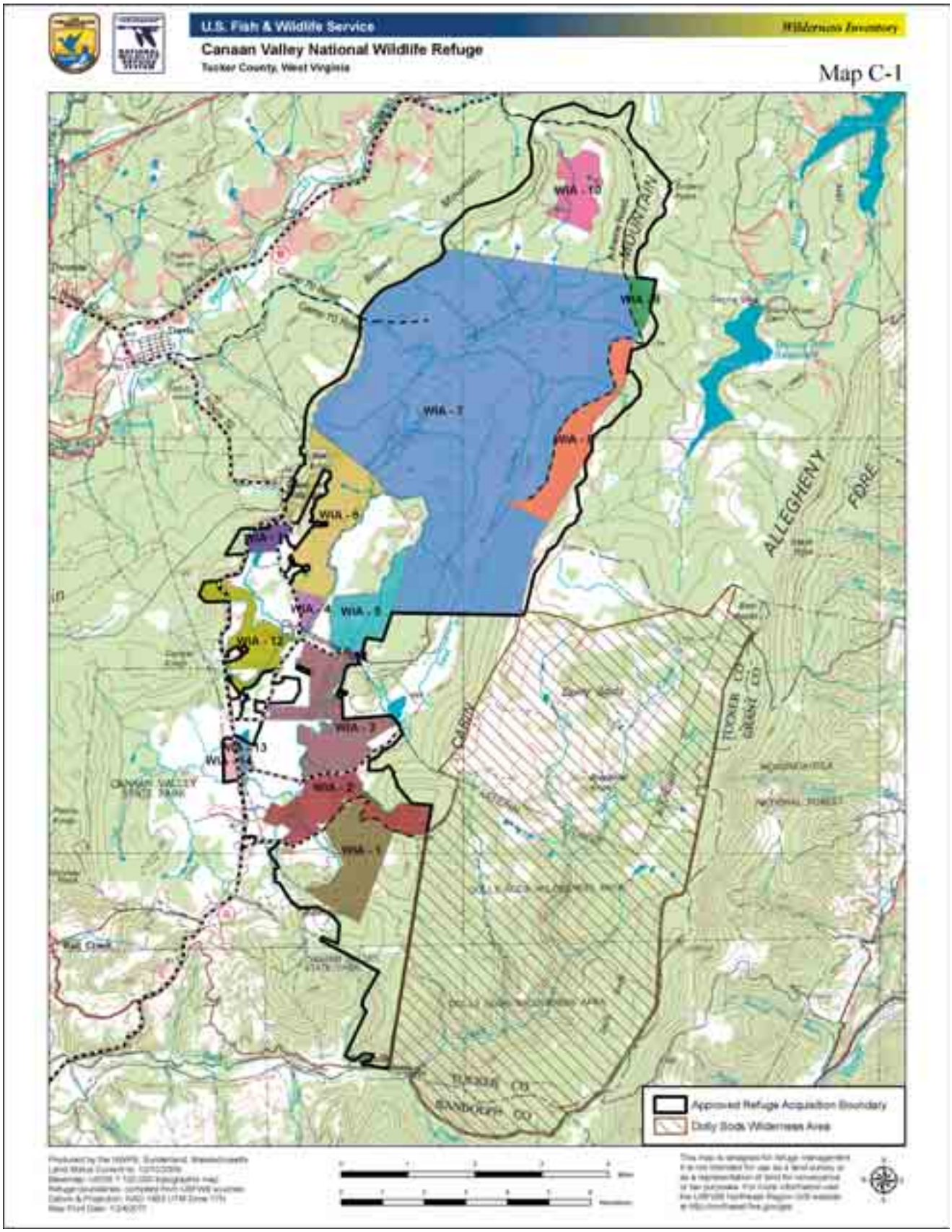

U.S. Fish & Wildlife Service
Wilderness Inventory
Canaan Valley National Wildlife Refuge
Tucker County, West Virginia
Map C-1
WIA - 10
WIA - 7
WIA - 6
WIA - 4
WIA - 5
WIA - 12
WIA - 3
WIA - 2
WIA - 1
ALLEGHENY
FORE
CANAAN VALLEY STATE PARK
TUCKER CO
RANDOLPH CO
Approved Refuge Acquisition Boundary
Dolly Sods Wilderness Area

Table C.1. Wilderness Evaluation

Wilderness Inventory Area	(1) Size: at least 5,000 acres; or a roadless island; or is of sufficient size to make practicable its preservation and use in an unimpaired condition; or is contiguous with designated or recommended wilderness by another Federal agency.	(2) Naturalness: generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable.	3(a) Solitude: has outstanding opportunities for solitude.	3(b) Primitive and Unconfined Recreation: has outstanding opportunities for primitive and unconfined-type of recreation.	(4) Supplemental Values: contains ecological, geological or other features of scientific, educational, scenic or historical value.	Parcel qualifies as a wilderness study area (meets criteria 1, 2, and 3a or 3b)
WIA 1 746 acres	No. Less than 5,000 acres; not an island; not of sufficient size for preservation and use in an unimpaired condition; not adjacent to a Federal wilderness area.	No. Due to intense logging in the past and miles of logging roads, this area exhibits signs of major human impact and would require extensive restoration efforts to restore its naturalness. This area has not yet been restored, nor is it in the process of being restored.	No. Adjacent commercial cross-country skiing and snowshoeing operation attracts thousands of recreational users during the winter months.	No. The size of this tract and the fact that it is surrounded on all sides by either a road or private property make it difficult for recreational users to experience unconfined recreation.	Yes. Threatened and endangered species habitat	No
WIA 2 768 acres	Yes. Less than 5,000 acres; not an island; and not of sufficient size for preservation and use in an unimpaired condition. WIA 2 and Dolly Sods Wilderness Area meet where Forest Road 80 crosses over from refuge land to Forest Service land.	No. The property has an actively maintained gas pipeline right-of-way (ROW) and a high power transmission line. The ROW requires regular mowing, so both these features constitute major human impacts that significantly affect the property's naturalness.	No. Because this area is adjacent to Timberline Resort, which attracts thousands of skiers in the winter and hundreds of bicyclists in the summer, there are limited opportunities for solitude. Visual and auditory impacts of this resort include housing developments and roads.	No. Because of its small size and the surrounding developed areas (private property), there are limited opportunities for primitive and unconfined recreation.	Yes. Rare plant communities, scenic value, endangered species habitat	No

Wilderness Inventory Area	(1) Size: at least 5,000 acres; or a roadless island; or is of sufficient size to make practicable its preservation and use in an unimpaired condition; or is contiguous with designated or recommended wilderness by another Federal agency.	(2) Naturalness: generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable.	3(a) Solitude: has outstanding opportunities for solitude.	3(b) Primitive and Unconfined Recreation: has outstanding opportunities for primitive and unconfined-type of recreation.	(4) Supplemental Values: contains ecological, geological or other features of scientific, educational, scenic or historical value.	Parcel qualifies as a wilderness study area (meets criteria 1, 2, and 3a or 3b)
WIA 3 992 acres	No. Less than 5,000 acres, not an island and not adjacent to a Federal wilderness area. Not suitable for preservation and use in an unimpaired condition, and not suitable for wilderness management because of its shape and irregular boundary, and lack of a sufficient core area that leaves the whole area vulnerable to impairment from adjacent land uses.	No. The property has an actively maintained gas pipeline right-of-way and a high power transmission line. The ROW requires regular mowing, so both these features constitute major human impacts that significantly affect the property's naturalness.	No. The area's north and east side is adjacent to Timberline Resort. Visitors will see development from every perspective in this inventory area, thus limiting opportunities for solitude. Auditory impacts from resort residents and guests, and from surrounding roads, also limit opportunities for solitude.	No. The area's irregular boundary and lack of a large core do not lend itself to outstanding opportunities for primitive and unconfined recreation.	Yes. Rare plant communities, scenic value	No
WIA 4 107 acres	No. Less than 5,000 acres, not an island, not of sufficient size to make practicable its preservation and use in an unimpaired condition, and not suitable for wilderness management. Also, not adjacent to a Federal wilderness area.	No. Although physical and plant communities are natural, this area is bordered by a county road. Vehicle traffic on this road constitutes a major human impact and seriously affects the naturalness character.	No. Because of the visual and auditory impacts of the bordering county road, there is virtually no opportunity for solitude.	No. Because of the small size and the proximity of the county road, there are no outstanding opportunities for primitive or unconfined recreation.	Yes. Ecological values because of the wetland.	No

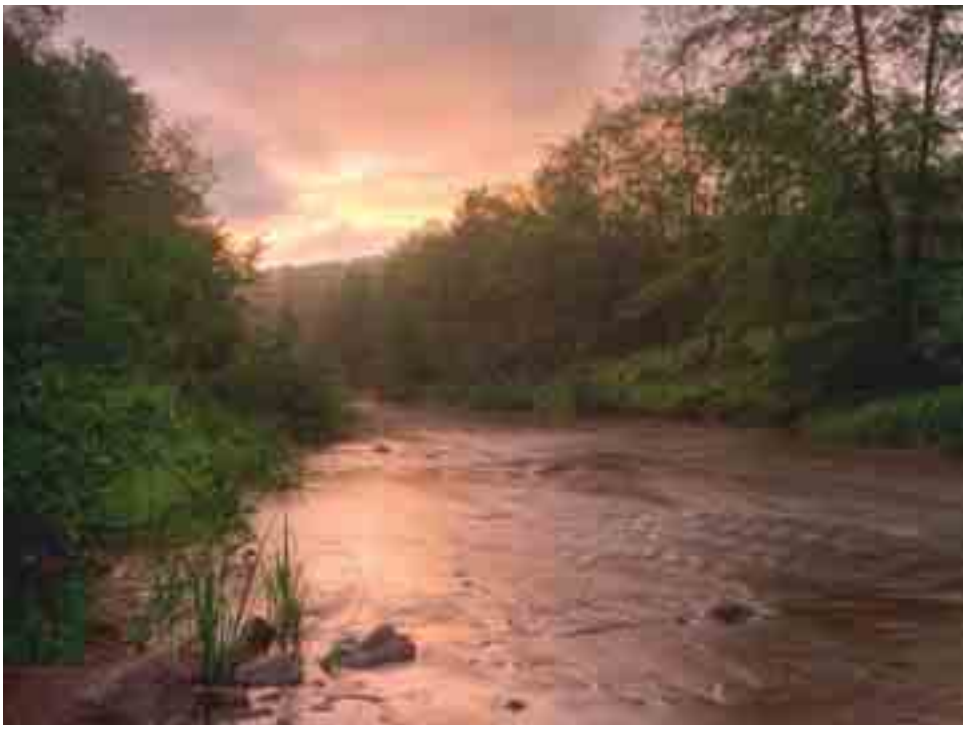
Wilderness Inventory Area	(1) Size: at least 5,000 acres; or a roadless island; or is of sufficient size to make practicable its preservation and use in an unimpaired condition; or is contiguous with designated or recommended wilderness by another Federal agency.	(2) Naturalness: generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable.	3(a) Solitude: has outstanding opportunities for solitude.	3(b) Primitive and Unconfined Recreation: has outstanding opportunities for primitive and unconfined-type of recreation.	(4) Supplemental Values: contains ecological, geological or other features of scientific, educational, scenic or historical value.	Parcel qualifies as a wilderness study area (meets criteria 1, 2, and 3a or 3b)
WIA 5 547 acres	No. Less than 5,000 acres; not an island; not of sufficient size to make practicable its preservation and use in an unimpaired condition, and not suitable for wilderness management. Also, not adjacent to a Federal wilderness area.	No. The property contains a private in-holding that has a power line and a maintained road that is suitable for public travel. These two features significantly impair the area's naturalness.	No. Opportunities for solitude are limited and not outstanding because of a road that runs through the property and because of the adjacent Timberline Resort, which has substantial development.	No. Because of the area's small size and the adjacent county road, there are no outstanding opportunities for primitive or unconfined recreation.	Yes. Ecological values	No
WIA 6 966 acres	No. Less than 5,000 acres and not an island. Not suitable for preservation and use in an unimpaired condition, and not suitable for wilderness management because of slivers of land on the area's west side that create an unmanageable boundary and leaves these areas vulnerable to impairment from adjacent land uses. Not adjacent to a Federal wilderness area.	Yes.	No. Although the northern portions of this area may provide some outstanding opportunities for solitude, this is only a small portion of the rest of the area and it is not representative of the whole area. Substantial visual and auditory impacts of surrounding developments and roads affect the wilderness character of the rest of the area.	No. Because of the area's small size and adjacent roads, there are no outstanding opportunities for primitive or unconfined recreation.	Yes. Rare plant communities, scenic values	No
WIA 7 9,969 acres	Yes. Greater than 5,000 acres and shares a boundary of a little under 400 feet with the Dolly Sods Wilderness Area	Yes. However, possible unexploded ordnance issues need to be explored	Yes	Yes	Yes. Rare plant communities, scenic values	Yes

Wilderness Inventory Area	(1) Size: at least 5,000 acres; or a roadless island; or is of sufficient size to make practicable its preservation and use in an unimpaired condition; or is contiguous with designated or recommended wilderness by another Federal agency.	(2) Naturalness: generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable.	3(a) Solitude: has outstanding opportunities for solitude.	3(b) Primitive and Unconfined Recreation: has outstanding opportunities for primitive and unconfined-type of recreation.	(4) Supplemental Values: contains ecological, geological or other features of scientific, educational, scenic or historical value.	Parcel qualifies as a wilderness study area (meets criteria 1, 2, and 3a or 3b)
WIA 8 693 acres	No. Less than 5,000 acres and not an island. Not suitable for preservation and use in an unimpaired condition and not suitable for wilderness management because of its long, narrow configuration and lack of a sufficient core area that leaves the whole area vulnerable to impairment from adjacent land uses. Also, not adjacent to a Federal wilderness area.	No. This area contains a significant amount of logging roads that have not been restored and are not in the process of being restored. Also, the area is bounded by A-Frame Road, a maintained public road. Both these road impacts have a significant effect on the area's naturalness.	No. Because this is a linear area that is bounded for miles by A-Frame Road, there are no outstanding opportunities for solitude.	No. Because of the small size of the area and because it is bounded for miles by A-Frame Road, there are no outstanding opportunities for primitive and unconfined recreation.	Yes. Scenic values	No
WIA 9 149 acres	No. Less than 5,000 acres and not an island. Not suitable for preservation and use in an unimpaired condition and not suitable for wilderness management because of its lack of a sufficient core area that leaves the whole area vulnerable to impairment from adjacent land uses. Also, not adjacent to a Federal wilderness area.	Yes.	No. Because the area is so small and because a large portion of it is bounded by A-Frame Road, there are no outstanding opportunities for solitude	No. Because of the small size of the area and because so much of it is bounded by A-Frame Road, there are no outstanding opportunities for primitive and unconfined recreation.	Yes. Scenic values	No

Wilderness Inventory Area	(1) Size: at least 5,000 acres; or a roadless island; or is of sufficient size to make practicable its preservation and use in an unimpaired condition; or is contiguous with designated or recommended wilderness by another Federal agency.	(2) Naturalness: generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable.	3(a) Solitude: has outstanding opportunities for solitude.	3(b) Primitive and Unconfined Recreation: has outstanding opportunities for primitive and unconfined-type of recreation.	(4) Supplemental Values: contains ecological, geological or other features of scientific, educational, scenic or historical value.	Parcel qualifies as a wilderness study area (meets criteria 1, 2, and 3a or 3b)
WIA 10 412 acres	Yes. Less than 5,000 acres, not an island, and not adjacent to Federal wilderness land, but suitable for preservation and use in an unimpaired condition and suitable for wilderness management.	Yes.	Yes, but the area is small and the traffic from Route 93 (to the north) is audible from anywhere on the property. Also, the status of the surrounding land use is uncertain and if it is not protected soon, it could be converted to a highly developed area.	No. Because of the area's small size and the surrounding private property, there are no outstanding opportunities for primitive and unconfined recreation.	Yes. Rare plant communities, scenic values, ecological values	Yes
WIA 11 134 acres	No. Less than 5,000 acres, not an island, not of sufficient size to make practicable its preservation and use in an unimpaired condition, and not suitable for wilderness management. Also, not adjacent to a Federal wilderness area.	No. A power line that runs through the property and auditory impacts from two major roads on either side of the property both have significant effects on the area's naturalness.	No. The area's small size and the visual and auditory impacts of surrounding developed lands and road use severely diminish any opportunities for solitude.	No. The area's small size and its proximity to a State highway make it unsuitable for outstanding opportunities for primitive and unconfined recreation.	Yes. Ecological Values.	No

Wilderness Inventory Area	(1) Size: at least 5,000 acres; or a roadless island; or is of sufficient size to make practicable its preservation and use in an unimpaired condition; or is contiguous with designated or recommended wilderness by another Federal agency.	(2) Naturalness: generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable.	3(a) Solitude: has outstanding opportunities for solitude.	3(b) Primitive and Unconfined Recreation: has outstanding opportunities for primitive and unconfined-type of recreation.	(4) Supplemental Values: contains ecological, geological or other features of scientific, educational, scenic or historical value.	Parcel qualifies as a wilderness study area (meets criteria 1, 2, and 3a or 3b)
WIA 12 526 acres	No. Less than 5,000 acres, not an island and not adjacent to a Federal wilderness area. Not suitable for preservation and use in an unimpaired condition and not suitable for wilderness management because of its shape and irregular boundary, and lack of a sufficient core area that leaves the whole area vulnerable to impairment from adjacent land uses.	No. The area is bisected by a power/ phone line, and contains a graveled refuge road used seasonally for hunter access. These two features have significant impacts on the area's naturalness character.	No. Visual and auditory impacts of surrounding developed lands and road use severely diminish any opportunities for solitude.	No. The area's small size and its proximity to a State highway make it unsuitable for outstanding opportunities for primitive and unconfined recreation.	Yes. Ecological Values.	No
WIA 13 79 acres	No. Less than 5,000 acres, not an island, not of sufficient size to make practicable its preservation and use in an unimpaired condition and not suitable for wilderness management. Also, not adjacent to a Federal wilderness area	No. The property has an actively maintained gas pipeline right-of-way that constitutes a major human impact and significantly affects the property's naturalness.	No. The area's small size and the visual and auditory impacts of surrounding developed lands and road use severely diminish any opportunities for solitude.	No. The area's small size and its proximity to a State highway make it unsuitable for outstanding opportunities for primitive and unconfined recreation.	No	No
WIA 14 74 acres	No. Less than 5,000 acres, not an island, not of sufficient size to make practicable its preservation and use in an unimpaired condition and not suitable for wilderness management. Also, not adjacent to a Federal wilderness area	No. This area contains the refuge headquarters and maintenance facilities as well as an active natural gas well. These structures have significant impacts on the area's naturalness character.	No. The area's small size and the visual and auditory impacts of surrounding developed lands and road use severely diminish any opportunities for solitude.	No. The area's small size and its proximity to a State highway make it unsuitable for outstanding opportunities for primitive and unconfined recreation.	No	No

Appendix D



Frank Ceravalo

Blackwater River

Wild and Scenic River Review

- **Introduction**
- **Phase I – Wild and Scenic River Inventory**

Introduction

The Wild and Scenic Rivers Act (Act), (Pub.L. 90-543 as amended: 16 U.S.C. 1271-1287) established a method for providing Federal protection for certain free-flowing rivers, preserving them and their immediate environments for the use and enjoyment of present and future generations. The function of this wild and scenic river review is to inventory and study the rivers, river segments and their immediate environments within the Canaan Valley National Wildlife Refuge (refuge) acquisition boundary to determine if they merit inclusion in the National Wild and Scenic River System (NWSRS).

Section 5(d) (1) of the Act states in part: *In all planning for the use and development of water and related land resources, consideration shall be given by all Federal agencies involved to potential national wild, scenic and recreational river areas, and all river basin and project plan reports submitted to the Congress shall consider and discuss any such potential. The Secretary of the Interior and the Secretary of Agriculture shall make specific studies and investigations to determine which additional wild, scenic and recreational river areas within the United States shall be evaluated in planning reports by all Federal agencies as potential alternative uses of the water and related land resources involved.*

Wild and scenic river considerations are a required element of comprehensive conservation plans and conducted in accordance with the refuge planning process outlined in 602 FW 1 and 3, including public involvement and National Environmental Policy Act compliance.

As part of the Section 5(d) (1) review process, we are required to include all river segments that are within the planning area and listed in the Nationwide Rivers Inventory (NRI). The NRI is maintained by the National Park Service (Park Service) and lists more than 3,400 free-flowing river segments in the United States that are believed to possess one or more "outstandingly remarkable" natural or cultural values judged to be of more than local or regional significance. A 32 mile reach of the Blackwater River from the headwaters (Canaan Valley) to Hendricks is listed on the NRI. A 12.8 mile portion of the reach is within the planning area and is included as part of this NWSRS review.

When a river or river segment is determined to be potentially eligible through the inventory process, its eligibility status is forwarded to the Park Service for inclusion into the NRI. The results of this inventory will be forwarded to the Park Service for inclusion on the NRI.

There are three phases to the wild and scenic river review process: inventory, study, and recommendation. In the inventory stage, we determine if any of the river or river segments within the planning area are eligible for NWSRS designation. We then determine the potential classification of the eligible river or river segments as wild, scenic, or recreational (Table D-1). To be eligible for wild and scenic river designation, a river or river segment is required to be free flowing and possess at least one outstanding remarkable value (ORV). The Act identifies an ORV as recreational, geologic, fish, wildlife, historic, cultural, or other similar values. The river eligibility and classifications assigned during this inventory stage are tentative, and would be subject to further consideration during the study phase. Final determinations would be incorporated into the Comprehensive River Management Plan for any river/river segment receiving eventual designation as a component of the NWSRS.

In the study phase, we conduct a suitability study to determine if the river or river segments that were found eligible are suitable for designation to the NWSRS. The Act identifies the factors that will be considered and documented in determining the suitability of a river or river segment for inclusion in the NWSRS. Section 4(a) of the Act states that the study will include: … maps and illustrations, …; the characteristics which do or do not make the area a worthy addition to the syste*m; the current status of landownership and use in the area; the reasonably foreseeable potential uses of the land and water which would be enhanced, foreclosed, or curtailed if the area were included in the national wild and scenic rivers system; the Federal agency … by which it is proposed the area, should it be added to the system, be administered; the extent to which it is proposed that such administration, including the costs thereof, be shared by State and local agencies; and the estimated cost to the United States of acquiring necessary lands and interests in land and of administering the area, should it be added to the system….*

The study area covers each river or river segment and their immediate environment. The immediate environment is an area extending the length of the river or river segment being studied and extending in width one-quarter mile from each bank of the river.

The recommendation phase consists of forwarding the wild and scenic river study report from the Director of the U.S. Fish and Wildlife Service (Service) through the Secretary of the Interior and the President to Congress. The report is prepared after the record of decision for the final Comprehensive Conservation Plan (CCP) has been signed. The river or river segments recommended for NWSRS designation are managed to maintain their character in accordance with management goals, objectives, and strategies outlined in the final CCP until congress makes a favorable legislative determination or the CCP is amended to modify or remove the wild and scenic river proposal.

This wild and scenic river review is limited to the inventory phase only. In this phase, the interdisciplinary study team (IDT) inventoried five rivers or river segments within the refuge's acquisition boundary. For each river or river segment we provide its name, length, outstanding remarkable values, and tentative classification (see below).

We did not go beyond this phase because, for the purposes of the CCP, we only look at those rivers or river segments that are located within the refuge's acquisition boundary. However, because there is not necessarily a break in the character of these waterways at the refuge boundary, we feel it would be more appropriate to do a landscape level review of these waterways, particularly the full, 32-mile reach of the Blackwater River that is listed in the NRI. This larger review would involve a broader set of partners and would go beyond the scope of this CCP. Furthermore, due to previous personnel commitments, the affected State agencies and partners were not yet prepared to provide the level of involvement that will be required to move the results of the inventory phase of this review to the study and recommendation phases. In summary, we believe that the rivers that were inventoried in this review should all be studied in total and with the full participation and involvement of our Federal, State, local, and non-governmental partners.

The Interdisciplinary Study Team

The IDT, comprising Service Region 5 Regional Office, Canaan Valley refuge, and West Virginia Division of Natural Resources (WVDNR), met at the refuge on February 20, 2007 to determine if any of the river or river segments within the planning area were eligible for NWSRS designation, and to tentatively classify each eligible river or river segment as wild, scenic, or recreational. This process required combining site knowledge with existing land status maps, photographs, and available land use information to determine if any of the refuge riverine systems were eligible for NWSRS designation. Additional information on the planning area's river resource values, and guidance on alternative river conservation and management approaches, was provided through public/stakeholder involvement. The river eligibility and classifications that were assigned during the inventory phase are tentative.

The IDT members are listed below.

- Jonathan Schafler, Refuge Manager, Canaan Valley refuge, Davis, West Virginia
- Andy Hofmann, Deputy Refuge Manager, Canaan Valley refuge, Davis, West Virginia
- Ken Sturm, Wildlife Biologist, Canaan Valley refuge, Davis, West Virginia
- Leah Ceperley, former Wildlife Biologist, Canaan Valley refuge, Davis, West Virginia
- Jackie Burns, Park Ranger, Canaan Valley refuge, Davis, West Virginia
- Beth Goldstein, Planning Team Leader, Northeast Regional Office, Hadley, MA
- Keith Krantz, Wildlife Biologist, WVDNR

The IDT will meet within two years of the approval the CCP to determine if any of the river or river segments within the planning area are eligible for NWSRS designation, and to tentatively classify each eligible river or river segment as wild, scenic, or recreational. This process will require combined site knowledge with existing land status maps, photographs, and available land use information to determine if any of the refuge riverine systems were eligible for NWSRS designation. Additional information on the planning area's river resource values, and guidance on alternative river conservation and management approaches, will be provided through public/stakeholder involvement. The river eligibility and classifications that were assigned during the inventory phase are tentative.

Phase I – Wild and Scenic River Inventory

Introduction

The function of the wild and scenic river inventory is to identify rivers or segments of rivers and their immediate environment within the planning area that meet the minimal criteria for wild and scenic river eligibility under the Act. The wild and scenic river inventory area considers all river or river segments within the planning area and their immediate environments. The immediate environment is the area extending the length of the river or river segment being studied and extending a width of one-quarter mile from each bank of the river. The immediate environment is not to exceed 320 acres per river mile. Those rivers or river segments that meet the minimal eligibility criteria are tentatively classified as wild, scenic, or recreational.

Minimal Wild and Scenic River Criteria

To be eligible for designation as a wild and scenic river, a river or river segment and their immediate environment is required to possess at least one ORV and be free flowing.

Outstanding Remarkable Values

Section 1(b) of the Act identifies the ORVs in the following manner:

> *"It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations."*

The following ORV definitions were taken from the December 1999 joint U.S. Forest Service and Park Service technical report entitled The Wild and Scenic River Study Process. The technical report was prepared for the interagency Wild and Scenic Rivers Coordinating Council. As stated in the report:

The following eligibility criteria are offered to foster greater consistency within the Federal river-administering agencies. They are intended to set minimum thresholds to establish ORVs and are illustrative but not all-inclusive. If utilized in an agency's planning process, these criteria may be modified to make them more meaningful in the area of comparison, and additional criteria may be included.

> ***Scenery**: The landscape elements of landform, vegetation, water, color and related factors result in notable or exemplary visual features and/or attractions. Scenery and visual attractions may be highly diverse over the majority of the river or river segment.*
>
> ***Recreation**: Recreational opportunities are, or have the potential to be, popular enough to attract visitors from throughout or beyond the region of comparison or are unique or rare within the region.*
>
> - *Interpretive opportunities may be exceptional and attract, or have the potential to attract, visitors from outside the region of comparison.*
> - *The river may provide, or have the potential to provide, settings for national or regional usage or competitive events.*
>
> ***Geology**: The river or the area within the river corridor contains one or more example of a geologic feature, process or phenomenon that is unique or rare within the region of comparison.*
>
> ***Fish**: Fish values may be judged on the relative merits of fish populations, habitat, or a combination of these river-related conditions.*
>
> - ***Populations**: The river is nationally or regionally an important producer of resident and/or anadromous fish species. Of particular significance is the presence of wild stocks and/or Federal or State listed (or candidate) threatened, endangered or sensitive species. Diversity of species is an important consideration and could, in itself, lead to a determination of "outstandingly remarkable."*

- ***Habitat****: The river provides exceptionally high quality habitat for fish species indigenous to the region of comparison. Of particular significance is habitat for wild stocks and/or Federal or State listed (or candidate) threatened, endangered or sensitive species. Diversity of habitats is an important consideration and could, in itself, lead to a determination of "outstandingly remarkable."*

Wildlife: *Wildlife values may be judged on the relative merits of either terrestrial or aquatic wildlife populations or habitat or a combination of these conditions.*

- ***Populations:*** *The river, or area within the river corridor, contains nationally or regionally important populations of indigenous wildlife species. Of particular significance are species considered to be unique, and/or populations of Federal or State listed (or candidate) threatened endangered or sensitive species. Diversity of species is an important consideration and could, in itself, lead to a determination of "outstandingly remarkable."*

- ***Habitat:*** *The river, or area within the river corridor, provides exceptionally high quality habitat for wildlife of national or regional significance, and/or may provide unique habitat or a critical link in habitat conditions for Federal or State listed (or candidate) threatened, endangered or sensitive species. Contiguous habitat conditions are such that the biological needs of the species are met. Diversity of habitats is an important consideration and could, in itself, lead to a determination of "outstandingly remarkable."*

Prehistory*: The river, or area within the river corridor, contains a site(s) where there is evidence of occupation or use by Native Americans. Sites must have unique or rare characteristics or exceptional human interest value(s). Sites may have national or regional importance for interpreting prehistory; may be rare and represent an area where a culture or cultural period was first identified and described; may have been used concurrently by two or more cultural groups; and/or may have been used by cultural groups for rare sacred purposes. Many such sites are listed on the National Register of Historic Places, which is administered by the NPS.*

History: *The river or area within the river corridor contains a site(s) or feature(s) associated with a significant event, an important person, or a cultural activity of the past that was rare or one-of-a-kind in the region. Many such sites are listed on the National Register of Historic Places. A historic site(s) and/or features(s) is 50 years old or older in most cases.*

Other Values: *While no specific national evaluation guidelines have been developed for the "other similar values" category, assessments of additional river-related values consistent with the foregoing guidance may be developed -- including, but not limited to, hydrology, paleontology and botany resources.*

Wild and Scenic River Classification

Section 2(b) of the Act defines the classifications of Wild and Scenic Rivers in the following manner:

Every wild, scenic or recreational river in its free-flowing condition, or upon restoration to this condition, shall be considered eligible for inclusion in the National Wild and Scenic Rivers System and, if included, shall be classified, designated, and administered as one of the following:

1) Wild river areas *-- Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.*

2) Scenic river areas -- *Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.*

3) ***Recreational river areas*** *-- Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.*

Summary of the Wild and Scenic River Inventory Findings

All or portions of five rivers occur within the planning area and were considered for wild and scenic river eligibility during the inventory. For inventory purposes, the IDT evaluated those portions of each river, defined as a "river segment", which lie within the refuge's currently approved acquisition boundary (see map D-1). The IDT members determined that all five segments met the criteria for wild and scenic river eligibility. These five river segments and their immediate environments were determined to be free- flowing and possess at least one ORV. A description of each eligible river segment, its immediate environment, and the IDT inventory findings are summarized below. The IDT inventory findings are summarized in Table D-2.

River Segment: Blackwater River
Length: 12.8 miles
Outstandingly Remarkable Values: Scenic, Recreation, Fishing, Wildlife, Other Values (rare wetland communities)
Tentative Classification: Scenic, Recreation

This large, free flowing section of the Blackwater River is tannic and generally flat with a bottom that varies from rocky to sandy. There is no development along the Blackwater within the refuge, although there is some development as it leaves the refuge boundary and approaches the town of Davis, West Virginia. The most dominant habitat types along the river are northern hardwood forest and shrub wetlands.

The Blackwater River was historically home to cold water fish including brook trout and redside dace. However, past land use has affected temperature and acidity in the river. It is now assumed that both native brook trout and redside dace have been extirpated from the mainstem Blackwater though they may still be found in several tributaries and springs. The current fishery in the Blackwater River includes warm water species and stocked trout. The river has one of the highest trout stocking rates in West Virginia according to WVDNR. Stocked species are primarily rainbow trout with the addition of brown, brook, and golden trout. Fishing can be moderate to heavy and is typically focused at the two sites where roads cross the river. A fishing pier has been constructed on the refuge at one of these sites to facilitate access. There are five other fishing access points via refuge trails. Kayaking and canoeing infrequently occur along this section of the Blackwater River since it is fairly shallow and contains large amounts of deadfall. Any boating activity on the river is usually associated with periods of high water after spring rains.

Other values include the coniferous habitats along the Blackwater River, which are rare, globally significant communities. Three of these communities, the Balsam Fir - Black Ash Swamp (S1,G1), Balsam Fir - Winterberry Swamp (S1,G2), and Balsam Fir - Oatgrass Swamp (S2,G2) are listed as extremely rare at both State and global levels. In addition, the river is important habitat for State-listed waterfowl including American black duck, mallard, and wood duck. The riparian corridor supports other State-listed birds including American bittern, alder flycatcher, northern goshawk and northern harrier. Beaver, muskrat, river otter, and mink can regularly be found along the river. Many State-listed small mammal species, including Eastern small-footed bat, southern pygmy shrew, and meadow jumping mouse have been documented from along the shoreline of the Blackwater River.

River Segment: North Branch Blackwater River
Length: 4.9 miles
Outstandingly Remarkable Values: Scenic, Wildlife, Other Values (rare wetland communities, circumneutral wetland system)
Tentative Classification: Scenic, Recreation

The North Branch of the Blackwater River begins on the Monongahela National Forest and flows down slope approximately 1 mile until it crosses State Route 32 and enters Canaan Valley refuge. After it enters the refuge, the North Branch is owned entirely by the Service except for two small sections (less than 0.25 miles combined). The sections of the North Branch on the refuge are primarily flat and meander northward to join the Blackwater River. The dominant habitat type along the North Branch is successional old field habitat interspersed with northern hardwood forest and shrub and herbaceous wetlands. There is some light development (farmland) that can be seen from sections of the river.

The North Branch was historically home to cold water fish, including redside dace and brook trout. However, changing land use affected temperature and acidity in the river, and it is assumed that neither brook trout nor redside dace are currently found in the stream. The current fishery resembles other streams in Canaan Valley and supports game fish including largemouth bass and brown trout. Fishing pressure on the North Branch is very light. There is one access point on this section, and it is rarely used by fishermen. Boating pressure on the North Branch is extremely light and is focused at times of high water.

Other values of the North Branch riparian corridor include globally rare conifer communities including Balsam Fir - Black Ash Swamp (S1,G1) and Balsam Fir - Winterberry Swamp (S1,G2). Rare plants including Jacob's ladder and glade spurge are also found within the riparian corridor of the North Branch. The riparian wetland system is one of the largest circumneutral wetlands in the State provide a rich botanical diversity. The North Branch provides habitat for many State-listed small mammal species, and larger mammals including beaver, mink, and muskrat regularly use the stream. The North Branch is documented habitat for State listed waterfowl including American black duck, mallard, and wood duck. The mixed old field and alder habitats along the North Branch are important for American woodcock, alder flycatcher, swamp sparrow, and northern harrier.

River Segment: Little Blackwater River
Length: 6.1 miles
Outstandingly Remarkable Values: Scenic, Wildlife, Other Values (rare wetland communities)
Tentative Classification: Scenic, Wild

The entire Little Blackwater River (including the headwaters) is free flowing and completely contained within the refuge's acquisition boundary. As of 2008, the refuge owns the entire river with the exception of a small 0.6 mile section that flows onto private land in between refuge tracts. There is no development along the shoreline of the Little Blackwater, and the river is currently inaccessible to the general public via road or trail. Primary habitat types along the Little Blackwater River are shrub and herbaceous wetlands. Northern hardwood forest and forested wetland make up less of the riparian zone of the Little Blackwater River than other rivers on the refuge. The fishery in the river includes largemouth bass, brown trout, and at least two species of catfish. Fishing and boating pressure is very light on the Little Blackwater, chiefly because there are no public access points.

Other values include several rare, globally significant communities along the Little Blackwater River, including Balsam Fir - Oatgrass Swamp (S2,G2), Nodding Sedge - Prickly Bog Sedge Seep (S2,G2), American Bur-reed Marsh (S2, G2G3), and Red Spruce - Yellow Birch - Mannagrass Swamp (S2S3,G3). The shrubby nature of habitats along the Little Blackwater makes it important for State listed species including alder flycatcher and swamp sparrow. The slow, meandering river lends itself as habitat for waterfowl including wood duck, mallard, and American black duck and is important for waterbirds like Wilson's snipe and American bittern. Beaver, mink, and river otter use the Little Blackwater regularly. The river has not been well surveyed for small mammals, though it is probable that the riparian corridor provides habitat for many State-listed small mammal species.

River Segment: Sand Run
Length: 1.6 miles
Outstandingly Remarkable Values: Scenic, Other Values (rare wetland communities)
Tentative Classification: Scenic, Wild

Sand Run is impounded by a dam within a private development upstream of Canaan Valley refuge. However, the 1.6 mile section of Sand Run that runs through the refuge is free flowing into the Blackwater River. Sand Run is primarily forested, with northern hardwoods making up over sixty percent of habitat found within the riparian zone. Sand Run can only be accessed by trail, and there is very light fishing and no boating on the stream. Sand Run was historically home to brook trout and redside dace. However, changing water temperature and chemistry impacted the fishery, and neither of these species have been reported from Sand Run since 1997. Other values of Sand Run's forested

riparian habitat include its importance for forest birds and as a movement corridor for various bat species. Additionally, the Sand Run riparian corridor contains globally rare communities including Balsam Fir - Black Ash Swamp (S1,G1), and Balsam Fir - Oatgrass Swamp (S2,G2). The refuge has started replanting the red spruce and balsam fir that historically grew along Sand Run.

River Segment: Glade Run
Length: 5.6 miles
Outstandingly Remarkable Values: Scenic, Wildlife, Other Values (rare wetland communities, circumneutral wetland system)
Tentative Classification: Scenic, Wild

Glade Run is a naturally flowing stream located entirely on the refuge. The stream is flat and gently runs northward through shrub wetland, old field, and northern hardwoods to join the Blackwater River. Glade Run is only accessible by trail and is lightly used by fishermen looking for warm water species like bass. The stream is small and not typically used for boating. Views of Glade Run from refuge trails are considered highly scenic and typify "Canaan Valley" to many visitors. There is no current development visible from Glade Run. There is one historic stone foundation visible from the stream, a remnant from the Bowman-Cardwell farm and a reminder of Canaan Valley's farming history.

Glade Run is naturally impounded into a series of large beaver ponds. These ponds and associated habitats are some of the most significant waterfowl and waterbird areas on the refuge. The Glade Run drainage provides habitat for wood duck and mallard as well as other State-listed species including American black duck, Wilson's snipe, American bittern, and swamp sparrow. Surrounding old field habitats are used by golden-winged warbler and meadow jumping mice. Nearby alder and aspen stands are considered high quality habitat for alder flycatcher and American woodcock. The Glade Run drainage is hunted by both local and visiting sportsmen every fall. River otter, beaver, and mink are found along Glade Run, and over twenty odonate species have been documented from the site. Migrating bald eagles are regularly spotted along the drainage. Other values of Glade run include its contribution to a large circumneutral riparian wetland system that provides rich botanical diversity. A variety of rare plant species and communities occur within this watershed supported by Glade Run. It is home to one of the largest American bur-reed marshes in West Virginia. This community has been ranked rare at both a State and global level (S2, G2/G3).

Protective Management

When a river segment is determined to be eligible and given a preliminary classification, the outstandingly remarkable values shall be afforded adequate protection, subject to valid existing rights, and until the eligibility determination is superseded. Management activities and authorized uses shall not be allowed to adversely affect either the eligibility, or the tentative classification from a wild area to a scenic area or a scenic area to a recreational river area. Therefore, during this interim period between the completion of this inventory phase with the signing of the CCP, and the time that the recommendation phase will be completed, we will manage the above inventoried river segments in a way that will preserve their outstanding remarkable values and that will not prevent us from fulfilling and carrying out refuge establishing purposes and the Refuge System mission.

Specific management prescriptions for eligible river segments should provide protection in the following ways:

1. Free-flowing values: The free-flowing characteristics of the eligible river segments cannot be modified to allow stream impoundments, diversions, channelization and/or rip-rapping to the extent the Service is authorized under law.

2. River Related Values: Each segment shall be managed to protect identified outstandingly remarkable values and, to the extent practicable such values shall be enhanced.

3. Classification Impacts: Management and development of the eligible river and its corridor cannot be modified, subject to valid existing rights, to the degree that its eligibility or tentative classification would be affected.

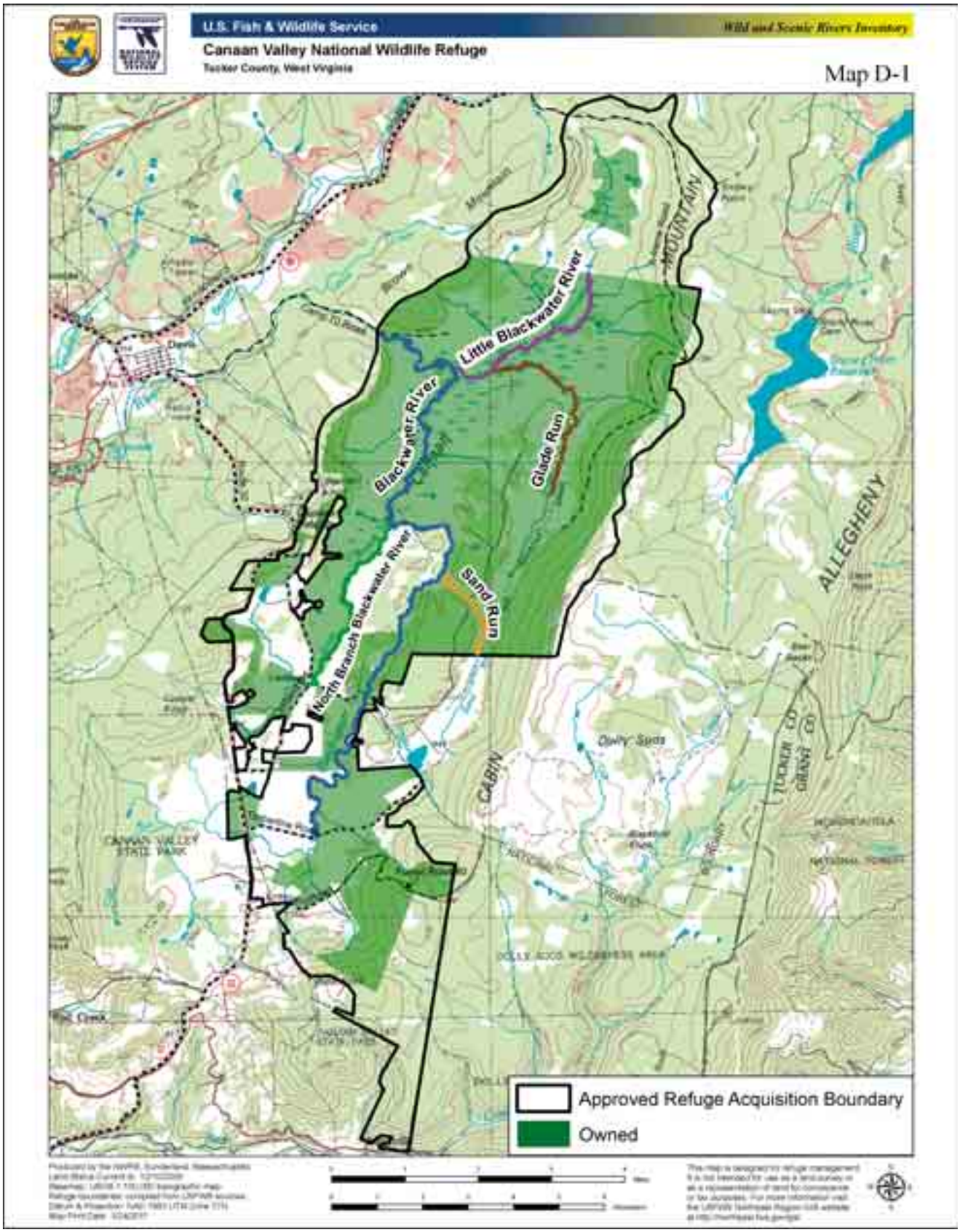

U.S. Fish & Wildlife Service
Wild and Scenic Rivers Inventory
Canaan Valley National Wildlife Refuge
Tucker County, West Virginia
Map D-1
Little Blackwater River
Blackwater River
Glade Run
Sand Run
North Branch Blackwater River
ALLEGHENY
MOUNTAIN
CABIN
CANAAN VALLEY STATE PARK
Dolly Sods
TUCKER CO
GRANT CO
Approved Refuge Acquisition Boundary
Owned

Table D.1. Classification Criteria for Wild, Scenic and Recreational River Area[1]

Attribute	Wild	Scenic	Recreational
Water Resources Development	Free of impoundment.	Free of impoundment.	Some existing impoundment or diversion. The existence of low dams, diversions, or other modifications of the waterway is acceptable, provided the waterway remains generally natural and riverine in appearance.
Shoreline Development	Essentially primitive. Little or no evidence of human activity. The presence of a few inconspicuous structures, particularly those of historic or cultural value, is acceptable. A limited amount of domestic livestock grazing or hay production is acceptable. Little or no evidence of past timber harvest. No ongoing timber harvest.	Largely primitive and undeveloped. No substantial evidence of human activity. The presence of small communities or dispersed dwellings or farm structures is acceptable. The presence of grazing, hay production, or row crops is acceptable. Evidence of past or ongoing timber harvest is acceptable, provided the forest appears natural from the riverbank	Some development. Substantial evidence of human activity. The presence of extensive residential development and a few commercial structures is acceptable. Lands may have been developed for the full range of agricultural and forestry uses. May show evidence of past and ongoing timber harvest.
Accessibility	Generally inaccessible except by trail. No roads, railroads or other provision for vehicular travel within the river area. A few existing roads leading to the boundary of the river area is acceptable.	Accessible in places by road Roads may occasionally reach or bridge the river. The existence of short stretches of conspicuous or longer stretches of inconspicuous roads or railroads is acceptable.	Readily accessible by road or railroad. The existence of parallel roads or railroads on one or both banks as well as bridge crossings and other river access points is acceptable.
Water Quality	Meets or exceeds Federal criteria or Federally approved State standards for aesthetics for propagation of fish and wildlife normally adapted to the habitat of the river and for primary contact recreation (swimming), except where exceeded by natural conditions.	No criteria prescribed by the Act. The Federal Water Pollution Control Act Amendments of 1972 have made it a national goal that all waters of the United States be made fishable and swimmable. Therefore, rivers will not be precluded from scenic or recreational classification because of poor water quality at the time of their study, provided a water quality improvement plan exists or is being developed in compliance with applicable Federal and State laws.	

1 *Table 1 taken from: Diedrich, J., Thomas C. 1999. The Wild & Scenic River Study Process. U.S. Forest Service and National Park Service.*

Table D.2. Eligible Rivers within the Canaan Valley National Wildlife Refuge

River Name	River Segment Description	Outstandingly Remarkable Values							Tentative Classification			FWS River Segment Length (Miles)*
		Scenery	Recreation	Geology	Fish	Wildlife	Cultural	Other Values	Wild	Scenic	Recreational	
Blackwater River	Segment within the CVNWR between Rt.32 and Camp 70 Rd.	X	X		X	X		X		X	X	12.8
North Branch Blackwater River	Segment between rt 32. and confluence of Blackwater River	X	X			X		X		X	X	4.9
Little Blackwater River	Segment from headwaters in northern Canaan Valley to confluence with Glade Run	X				X		X	X	X		6.1
Sand Run	Segment from border of refuge and Timberline development to confluence with Blackwater River	X				X		X	X	X		1.6
Glade Run	Segment from headwaters to confluence with Little Black and Blackwater Rivers	X				X		X	X	X		5.6

** Segment lengths are approximate.*

Appendix E

USFWS

Blue crayfish

Process for Establishing Refuge Focal Species and Priority Habitats for Management under Alternative B

Introduction and Background

Biological goals and objectives for managing species and habitats serve as the foundation for developing respective refuge Comprehensive Conservation Plans (CCPs) and Habitat Management Plans. What follows is the description of a process the Canaan Valley National Wildlife Refuge (refuge) CCP planning team used to determine which species and associated habitats should be a management priority on this refuge.

The U.S. Fish and Wildlife Service (Service) is entrusted by congress to conserve and protect migratory birds and fish, Federally listed threatened and endangered species, inter-jurisdictional fish, wetlands, and certain marine mammals. These are collectively and individually referred to as Federal trust resources. In addition to this mission to protect and conserve Federal trust resources, each refuge has one or more purposes for which it was established that further guide its management goals and objectives. Finally, there are also a multitude of laws, mandates, policies, and conservation plans at various geographic scales, which influence refuge management priorities.

During the CCP process for Canaan Valley refuge, the planning team identified which species of conservation concern and associated habitats should be a focus for refuge management. In making this determination, the team considered the factors noted above, as well as the refuge's geographic location, local site capabilities, species' relative abundance and distribution, respective specie's status in national and regional conservation plans, and a determination of what the most important and effective ecological contribution the refuge could make within the context of the managed lands in the local landscape (Monongahela National Forest and State lands) and the National Wildlife Refuge System (Refuge System). Lastly, species were selected because their habitat needs broadly represent the habitat requirements for many other native wildlife dependent on these same habitat types, including other Federal trust resources. The selected species are referred to herein, and in the CCP, as "refuge focal species."

Following are the details used in the process to identify priority resources of concern, and ultimately, the refuge focal species and the habitat management priorities to benefit these resources. For each step, a brief synopsis is given, followed by a discussion of the details of each step.

1.0) Collect Information and Data

- 1.1) Identify Legal Mandates, Policies, and Establishing Purposes of the Refuge
- 1.2) Compile Matrix of Potential Resources of Concern Based on National, Regional, State, and Local Plans
- 1.3) Gather Expert Opinion
- 1.4) Develop Maps
- 1.5) Compile Existing Data

2.0) Identify Resources of Concern and Biological Goals and Objectives

1.0) Collect Information and Data

1.1) Legal Mandates, Policies and Establishing Purpose of the Refuge

Legal mandates for the Refuge System along with a refuge's establishing legislation and Service policies guide the process for selecting resources of concern. The Canaan Valley refuge was established under the Emergency Wetlands Resource Act (1986), and the Fish and Wildlife Act (1956).

The Environmental Assessment (EA), used to establish the refuge, states that the refuge was proposed to "insure the ecological integrity of the Valley and the continued availability of its wetland, botanical, and wildlife resources to the citizens of West Virginia and the United States."

Supporting Discussion:

Legal Mandates:
The establishing authorities allowing purchase of lands for Canaan Valley National Wildlife Refuge are:
1. The Emergency Wetlands Resources Act of 1986 (16 U.S. C. 3901 (b)):
"…for the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions."

2. Fish and Wildlife Act of 1956 (16 U.S.C. 742 f(a)(4)):
"…for the development, advancement, management, conservation, and protection of fish and wildlife resources…."

3. Migratory Bird Conservation Act (16 U.S.C. 715d)
"…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds."

The 1994 EA for establishing Canaan Valley refuge states that to support the purpose of the refuge system, each refuge emphasizes contributions it can make that support long-range objectives, given in priority order:

1. To preserve, restore, and enhance in their natural ecosystem (when practicable) all species of animals and plants that are endangered or threatened with becoming endangered.

2. To perpetuate the migratory bird resource.

3. To preserve a natural diversity and abundance of fauna and flora on refuge lands.

4. To provide an understanding and appreciation of fish and wildlife ecology and people's role in their environment, and to provide refuge visitors with high quality, safe, wholesome, and enjoyable recreational experiences oriented toward wildlife to the extent that these activities are compatible with the purposes for which the refuge was established.

Additionally the EA goes on to state that "Management activities in Canaan Valley will for the most part be related to monitoring and documenting successional change. In limited areas, active management may be pursued for specific purposes such as woodcock research and management, and wildlife habitat enhancement… .A determination to adopt any management practice would come only after careful consideration of its effect on floral and faunal components at the specific site, and its effect on the overall integrity and character of the valley."

More specific objectives were detailed in the 1994 EA and Station Management Plan:

1. Preserve in perpetuity approximately 28,000 acres of relict boreal habitat and a unique ecosystem, with its diverse flora and fauna.

2. Provide a unique educational opportunity by assisting with field studies of environmental inter-relationships and stimulating curiosity of living things by offering a variety of first-hand outdoor experiences.

3. Provide for bird watching, photography, nature study, hunting, fishing, and other wildlife-oriented activities consistent with other refuge objectives.

4. Establish a woodcock research and management area consistent with other Refuge objectives.

5. Provide and develop habitat for waterfowl consistent with preservation of existing ecosystems.

Service Policies:
Section 4(a)(3) of the National Wildlife Refuge System Improvement Act (Improvement Act) states, *"(A) each refuge shall be managed to fulfill the Mission of the System, as well as the specific purposes for which that refuge was established….."*

The Improvement Act further states, *"In administering the System, the Secretary shall….ensure that the biological integrity, diversity, and environmental health of the System are maintained for the benefit of present and future generations of Americans….."* To meet this mandate the Service developed a Biological Integrity, Diversity, and Environmental Health Policy (Integrity Policy) to provide implementation guidance (601 FW 3). The Integrity Policy uses historical conditions and the evaluation of a refuge at various landscape scales, including refuge, ecosystem, national, and international scales, to determine the integrity and environmental health of a refuge's lands and its contribution to biological diversity.

1. 2) Matrix of Potential Resources of Concern Based on National, Regional, State, and Local Conservation Plans

An overall list of species and habitats of conservation concern which were known or likely to occur on the refuge was developed during planning stages of the CCP. The list was compiled by the CCP planning team using national, regional, State, and local conservation plans. In particular the State Wildlife Conservation Action Plan (2006) and Natural Heritage Program lists as well as the U.S. Forest Service (USFS) Forest Plan (2006) were used extensively to develop appendix A.

Sources used to compile the list of resources of concern included:

- Bird Conservation Region (BCR) 28 – Appalachian Mountains
- Partners in Flight Physiographic Area 12
- North American Waterfowl Management Plan
- Federal Threatened and Endangered Species List
- West Virginia Natural Heritage Program – State Species of Concern
- West Virginia State Wildlife Conservation Action Plan
- USFS Forest Plan
- U.S. Fish and Wildlife Service Birds of Conservation Concern – Region 5
- Eastern Brook Trout Joint Venture Plan
- American Woodcock Conservation Plan
- American Woodcock Habitat BMP's for Central Appalachian Mountains Region
- Brooks Bird Club Migratory Bird Observatory data

1.3) Gather Expert Opinion

Between January and July of 2007 four meetings were held to discuss key issues for the refuge CCP. The purpose was to gather local experts together to obtain their individual opinions on the refuge's role and opportunities for management relative to the four topics proposed. These topics were: migratory birds, deer management, rare plant species, and visitor services. Attending the meetings were individuals from State and Federal agencies, non-profit organizations and universities. Meetings helped the refuge share and gather existing data, discuss regional perspectives, and help refine focal species lists.

1.4) Develop Maps

Maps were developed to assist with determining priority habitats and focal species. The following is a list of maps used throughout the CCP process.

- Current Vegetation Map
- Soils Map – U.S. Department of Agriculture Natural Resources Conservation Service Soil Types
- National Wetlands Inventory Map
- Ecological Land Units Map
- Landbird Species Distribution and Breeding Bird Survey Relative Abundance Maps

1.5) Compile Existing Data

Baseline wildlife and plant surveys have been conducted to assist with determining species presence and abundance on the refuge since 2001. Additionally historic data was reviewed from wildlife surveys conducted by State and university sources. The following is a list of inventories and surveys which have contributed to the selection of priority habitats and focal species.

- Anuran Call Counts
- Marshbird Call-Back Survey
- Waterfowl-Beaver Pond Use Survey
- Wetland Vegetation (through cooperative work with WVDNR)
- Terrestrial Amphibians and Small Mammals Survey
- Bats (Anabat and limited mist net work)
- Vernal Pool Amphibians and Stream Salamanders
- Landbirds (breeding point count data)
- American woodcock and Wilson's snipe breeding survey
- West Virginia Northern Flying Squirrel Monitoring
- Cheat Mountain Salamander Monitoring
- Invertebrate Surveys including snail, Lepidoptera, and Odonate
- Forest Inventory
- Fish Survey (through cooperative work with the West Virginia Departments of Natural Resources and Environmental Protection)
- Rare Plant Inventory

2.0) Identify Resources of Concern and Biological Goals and Objectives

Following the procedure outlined in the Service Manual "Identifying Refuge Resources of Concern and Management Priority" (USFWS 2007) the CCP Team integrated the information gathered (as described above) and moved through the process to develop a list of potential species of concern. This procedure followed multiple steps to take the biological information available and evaluate it based on the variety of plans, policies, agency mission, refuge purposes, and regional context. The overall list was further refined to eliminate species and plant communities for which the refuge had or could have little significant management or conservation contribution.

The planning team determined the most appropriate biological goals and objectives for the refuge based on Refuge System policy, and then found commonalities with the State partners in meeting State wildlife habitat goals. The freshwater wetlands and resources of concern that were identified as priorities for the refuge are a direct overlap with State wetland goals. The mixed spruce-fir/northern hardwood forest contributes to State goals for the priority landbird species that were chosen. This habitat type is also relevant for other State species of concern. The mixed forest will provide connectivity of habitats for mammals with large home ranges and some rare species and protects water quality and aquatic resources through riparian habitat management and restoration. The existing and proposed early successional habitat fits in with State and regional priorities for wildlife associated with this successional stage.

The final results of this process can be found in chapter 4, "Management Direction and Implementation," where we structure all our habitat management goals and objectives around refuge focal species and habitat management priorities.

Appendix F

Erin Holmes/USFWS

Youth Conservation Corps

Refuge Operations and Needs System (RONS) and Service Asset Management Maintenance System (SAMMS)

Table F.1. Refuge Operations and Needs System (RONS) database.

Project #	Project Title	Budget Category	Year 1 Cost	Recurring Cost	FTE's
FY08-2847	Improve refuge operations and visitor services	People	62,419	62,419	1
FY08-2941	Improve inventories and monitoring of refuge biological program	People	77,321	77,321	1
FY08-4886	Improve visitor services and volunteer coordination (outdoor recreation planner)	People	94,588	94,588	1
FY08-4921	Improve and maintain refuge facilities and equipment (facility services assistant)	People	31,662	31,662	.5
FY08-4930	Improve and support public use and habitat management programs (refuge operations specialist)	People	94,588	94,588	1
FY08-5048	Improve refuge public use program (purchase small excavator)		25,000		
FY??-9999	Improve and support public use and habitat management programs (visitor services professional)	People	77,321	77,321	1
FY??-9999	Improve interpretation and informational signage for public uses on the refuge		50,000		
FY??-9999	Conduct baseline inventory and monitoring projects which may include amphibian nesting and anuran breeding surveys		40,000		

Table F.2. Service Asset Management Maintenance System (SAMMS) table from Fiscal Year 2009.

Project #	Project Title	Budget Category	Year 1 Cost
05138409	Remove abandoned barn - Cooper Tract 51	Habitat	22,000
05138407	Remove abandoned barn on the Cooper Tract 49	Habitat	19,470
	Construct a bridge over Sand Run to facilitate trail connectivity	People	50,000
99999	Construct observation platform / photo blind at the end of A-Frame Road	People	15,000
	Connect Beall Trail to Middle Valley Trail	People	40,000
99999	Connect Swinging Bridge Trail to Cortland Road	People	1,000,000
99999	Construct observation platform where A-Frame Road enters the refuge	People	50,000
99999	Improve a launch site for boating on Old Timberline Road	People	25,000
99999	Construct floating platform for student pond studies	People	20,000
99999	Construct environmental education pavilion	People	300,000
99999	Construct larger meeting room in visitor center	People	1,000,000
99999	Construct deer exclosures to protect balsam seedlings	Habitat	500,000
99999	Construct five 1-acre deer exclosures for refuge research	Habitat	25,000
99999	Construct kiosk and directional signage for boat access points	People	8,000
99999	Remove 20 miles of old logging roads on Cabin Mountain to restore upland habitat	Habitat	200,000
99999	Remove and restore portions of Camp 70 (south) rail grade (3.46 mi) to restore hydrology.	Habitat	150,000
99999	Remove and restore portions of East Valley rail grade (2.11 mi) to restore hydrology	Habitat	130,000
99999	Remove and restore portions of the Little Blackwater rail grade (0.55 mi) to restore hydrology	Habitat	33,000
99999	Remove and restore portions of Middle Ridge West rail grade (2.1 mi) to restore hydrology	Habitat	125,000
99999	Construct additional signs and replace worn out interpretive signs on Freeland Trail	People	5,000
99999	Construct approx. a 500-ft pedestrian/bicycle bridge to connect Brown Mountain Overlook and Camp 70 trails.	People	40,000
99999	Construct two bridges over the Blackwater River in strategic locations to facilitate trail connectivity	People	700,000

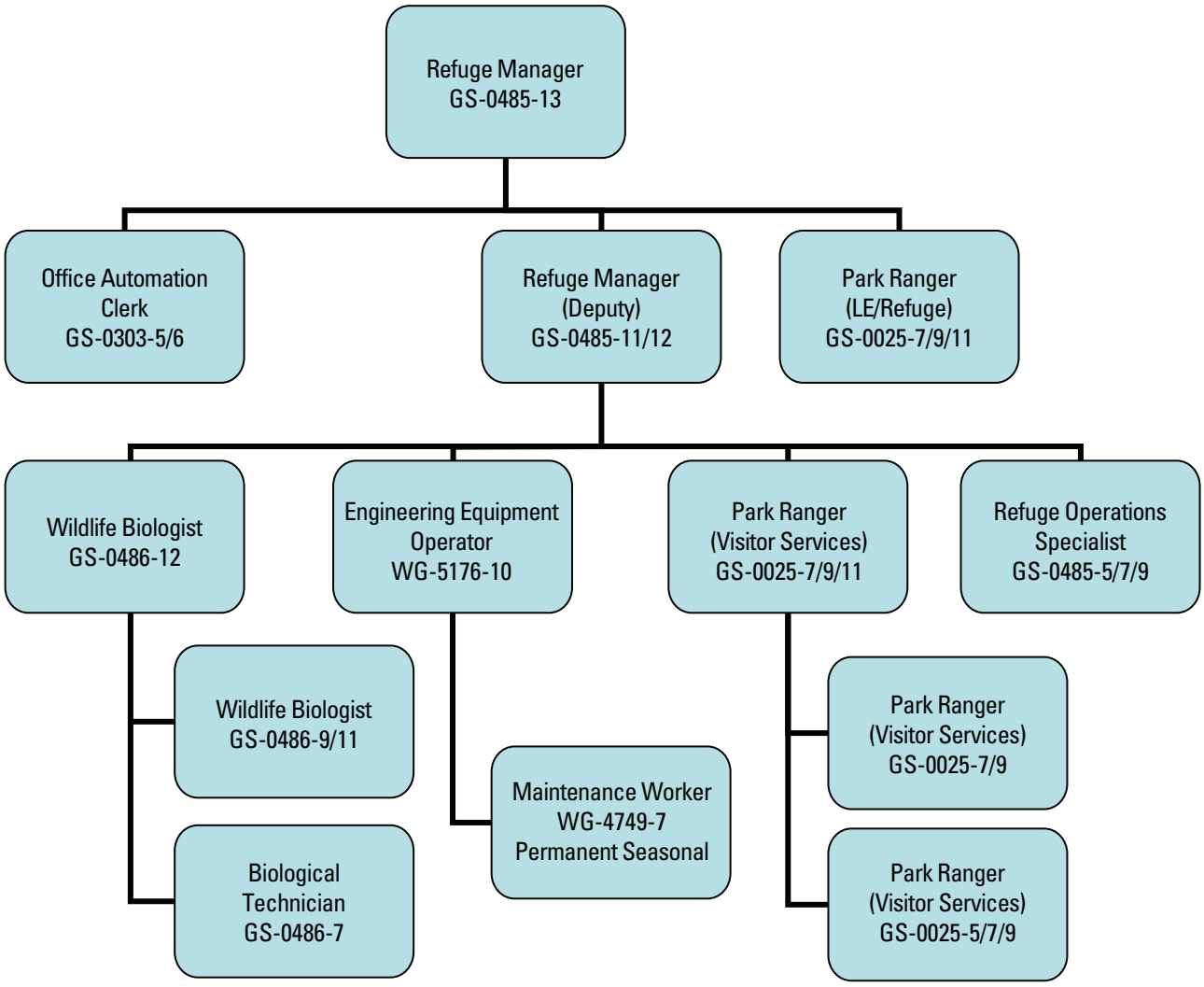
Appendix G

Mary Konchar

Wild School Day presentation with refuge biologist Ken Sturm

Staffing Chart

U.S. Fish and Wildlife Service
Canaan Valley National Wildlife Refuge
Final CCP Staff Chart



Appendix H

WVDNR

Cheat Mountain salamander

ESA Section 7 Consultation

INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM

Originating Person:
Beth Goldstein, Refuge Planner
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035

Telephone Number: (413) 253-8564

Date: April 20, 2010

I. Region: R5

II. Service Activity (Program): Comprehensive Conservation Plan for Canaan Valley National Wildlife Refuge

III. Pertinent Species and Habitat:

A. Listed species and/or their critical habitat within the action area:

Cheat Mountain Salamander (*Plethodon nettingi*)—Threatened
Indiana Bat (*Myotis sodalis*)—Endangered

B. Proposed species and/or proposed critical habitat within the action area:

None

C. Candidate species within the action area:

None

D. Include species/habitat occurrences on a map.

Provided to West Virginia Field Office.

IV. Geographic area or station name and action: Canaan Valley National Wildlife Refuge, Davis, WV

V. Location: Map Provided to West Virginia Field Office.

A. Ecoregion Number and Name: Ohio River Valley Ecosystem

B. County and State: Tucker County, West Virginia

C. Section, township, and range (or latitude and longitude):

Latitude = 39.1018, Longitude = -79.4349

D. Distance (miles) and direction to nearest town: 8 miles southeast of Davis, WV

E. Species/habitat occurrence:

The Refuge supports a diversity of wildlife in forest, meadow, and wetland habitats. A total of 286 species of fish, amphibians, reptiles, mammals and birds are known or expected to occur in the Canaan Valley. The land is managed and protected to maintain biological diversity and to protect and benefit threatened and endangered species and resident and migratory birds.

At least 28 species of fish occur in the rivers and streams including naturally reproducing brook trout (*Salvelinus fontinalis*) populations. Redside dace (*Clinostomus elongatus*), a rare State species, has also been found on the Refuge. Water quality concerns on the Blackwater River center around its suitability as a naturally reproducing trout stream.

Ten species of reptiles and 18 species of amphibians are known or likely to occur on Refuge lands. The most notable of these is the Federally threatened Cheat Mountain salamander, which occurs in high elevation spruce and hardwood forests.

At least 170 bird species are known or likely to occur in Canaan Valley. Migratory birds pass through the valley and have been well documented by long term banding and monitoring along the Allegheny Front. The area is important for those species requiring wetland habitats for foraging and resting during migration such as waterfowl {i.e., American black ducks (*Anas rubripes*)}, herons, shorebirds and American woodcock (*Scolopax minor*). Canaan Valley has been cited as an important staging and nesting area for American woodcock and Wilson's snipe (*Gallinago delicata)* due to the expansive wetland and early successional habitats present. Peregrine falcons (*Falco peregrinus*) are periodically seen in the area and northern goshawks (*Accipiter gentilis*), a Species of Concern, have been documented nesting at the north end of the valley and are observed occasionally at the south end. Bald eagles (*Haliaeetus leucocephalus*) are common during fall and winter months and golden eagles (*Aquila chrysaetos*) have been seen during migration.

All 48 species of mammals are considered year-round residents with the exception of migratory bats. The most conspicuous mammal is the white-tailed deer (*Odocoileus virginianus*), which has reached high densities in the southern portion of the valley including the Refuge. Deer browse pressure is heavy in the south end of the valley and likely a limiting factor to the regeneration of several plant species, most notably balsam fir. Wetland areas support populations of beaver, muskrat (*Ondatra zibethica*) and mink (*Mustela vison*). River otter (*Lutra canadensis*) may occur on the Refuge. Upland areas support species such as long-tailed weasels (*Mustela frenata*), bobcat (*Lynx rufus*), striped skunk (*Mephitis mephitis)*, red fox (*Vulpes fulva*) and grey fox (*Urocyon cinereoargenteus*), black bear (*Ursus americanus*) and fisher (*Martes pennanti*). Species of Concern may include the southern water shrew (*Sorex plaustris punctulatus*), Appalachian cottontail rabbit (*Sylvilagus obscurus*), southern rock vole (*Microtus chrotorrhinus carolinensis*), and the Allegheny woodrat (*Neotoma magistar*).

The Refuge provides habitat for one threatened and one endangered species. The threatened Cheat Mountain salamander (CMS) and the endangered Indiana bat have both been documented on the Refuge. The West Virginia northern flying squirrel *(Glaucomys sabrinus fuscus)* which occurs in Refuge forests was delisted as an endangered species in September 2008. The bald eagle, delisted in August 2007, uses the Refuge during migration. Both the West Virginia northern flying squirrel and the bald eagle, although delisted, remain priority species for Service protection and management.

VI. Description of proposed action

The final CCP provides management direction for the refuge for the next 15 years. This management direction is based on alternative B of the draft Comprehensive Conservation Plan/Environmental Assessment (draft CCP/EA). The draft CCP/EA was released in May 2010 and underwent an intra-Service Section 7 Biological Evaluation at that time. The actions in alternative B were found not likely to adversely affect any of the listed species in the action area.

The final CCP combines the actions we believe would most effectively achieve Refuge purposes, vision and goals, and respond to public issues. It emphasizes management of specific Refuge habitats to support focal species whose habitat needs benefit other species of conservation concern in the northern forest. In particular, we emphasize habitat for priority bird species of conservation concern identified for Bird Conservation Region (BCR) 28, Partners in Flight (PIF) Physiographic Area 12 and the West Virginia Conservation Action Plan. Additionally, it addresses the Refuge System's mandate to consider managing Refuge habitat under the Biological Integrity, Diversity and Environmental Health policy (2001).

Management actions to support objectives in the final CCP include managing early successional habitat for migratory bird species (includes grassland, shrubland and edge hardwood forest cutting) and conducting restoration actions on the Refuge's forested habitat. Restoration activities include reducing fragmentation, improving understory development and increasing mature forest characteristics of northern hardwood forests. Mixed red spruce/northern hardwood forests would be managed to increase, where suitable, spruce forest habitat and mature forest characteristics of this forest type.

In the final CCP, the refuge will continue acquisition of over 8,900 acres within the approved Refuge boundary. This includes the surrounding watershed of the Little Blackwater River which completely surrounds a wetland tract currently owned by the Refuge. This is the largest single purchase currently within the acquisition boundary. However, other significant tracts occur at the south end, including a 1,485-acre parcel which includes habitat for the threatened CMS and recently delisted West Virginia northern flying squirrel.

Below are specific descriptions of the listed species that could potentially be affected by the final CCP. Goal and objective numbers are provided to direct the reviewer to the appropriate sections in the final CCP that discuss actions that could potentially affect these species. We are seeking informal consultation on the final CCP.

Cheat Mountain Salamander

The CMS is a threatened species and a priority for Service protection and management. They are only found in West Virginia and are limited to approximately 80 fragmented populations in only five counties in the State. The Refuge's population represents one of the most northern for this species. Being a Federally threatened species tied to highly restricted plant communities, they are also considered a priority for conservation by the State as detailed in the State Wildlife Conservation Action Plan (WVDNR 2006).

Only one tract at the south end of the Refuge has been documented as occupied habitat for this species. Habitat requirements include a cool moist forest floor with adequate coarse woody debris and typically with a spruce or mixed spruce-hardwood forest overstory. The main threat to the CMS is degradation of high-elevation red spruce and spruce/northern hardwood forests. Since the CMS requires moist, cool habitats, any alteration of the habitat that reduces soil moisture and/or relative humidity can lead to adverse effects such as reduced reproductive success through nest desiccation (Pauley 2008a; Service 1991). Other threats include competition with other salamanders, drought, and pollution.

Past land use on the Refuge has removed most of the historical conifer forest cover allowing forest floor temperatures to increase, and relative humidities to decrease, thereby reducing habitat suitability for this species. Additionally, much of the tract where the salamander habitat is located contains old logging and skid roads, some of which are active cross-country ski trails operated by White Grass Touring Center. Roads and some trails have been noted impediments to CMS movements, possibly fragmenting and genetically isolating populations as well as making these populations more vulnerable to stochastic events. Refuge surveys have documented two cross-country ski trails which have populations of CMS on both sides of the trails. Research is currently being conducted by Dr. Tom Pauley to evaluate how types of trails may act to fragment salamander populations. Narrower trails with a closed canopy may not act as a strict barrier as other types of trails or logging roads.

Strategies which occur within habitat types occupied by CMS can be found under Goal 2, Objectives 2.3 to 2.5.

Indiana Bat

The Indiana bat is a Federally listed endangered species and a trust resource of the Fish and Wildlife Service. Primary foraging habitats include wetland and riparian areas, bottomland forests and edge habitats. Roost trees are typically in wooded wetlands, bottomland and floodplain forests, as well as upland habitats. Habitat loss and degradation, overutilization for scientific purposes, disease and predation, environmental contaminants, and the inadequacy of existing regulatory mechanisms for summer habitat threaten the population viability of the Indiana bat across its range. The Indiana Bat Draft Recovery Plan (USFWS 2007a) calls for the conservation and management of hibernacula and adjacent lands, summer habitat, and winter populations, for the monitoring of populations, and for the development of public outreach and information programs (Recovery Actions 1, 2, and 4). If Indiana bats are using the Refuge for foraging and roosting, then protecting, maintaining, and improving habitat quality on the Refuge would contribute to the viability of the species and its recovery. The conservation of this endangered species is now more important than ever as white-nose syndrome spreads across the range of the Indiana bat.

Acoustical recordings from 2003, 2006, 2007, and 2008 suggest Indiana bats are using riparian corridors and beaver ponds on the Refuge for summer foraging habitat. Mist-netting provides visual confirmation of their presence, reproductive information, the types of Refuge habitats used, and the seasons they are using the Refuge habitats. Summer use indicates a potential for maternity colonies to be located on or near the Refuge. As a key stage in the life cycle of the species, it is imperative to know the location of maternity colonies and protect them from disturbance. Radio telemetry of any lactating or recently lactating female bats found on the Refuge could define the habitats and locations that are important for this endangered species.

The strategies related to Indiana bats can be found under Goal 2, Objective 1.2. They include working with the USFWS West Virginia Field Office (WVFO) and the West Virginia Division of Natural Resources to coordinate mist net surveys for Indiana bats on Service-owned lands. Additionally, the Refuge will continue acoustical monitoring (ANABAT and SONOBAT) to detect potential presence of bats along all suitable habitats.

VII. Determination of effects:

A. Explanation of effects of the action on species and critical habitats in items III. A, B, and C (attach additional pages as needed):

Cheat Mountain Salamander

Under current management of Refuge habitat occupied by the salamander, the Refuge has received concurrence in previous consultations (1999, 2003) of no adverse affects given conditions of no new trails and limited trail clearing on existing trails. In the final CCP, the refuge will maintain existing trails for winter use, but no new trails will be constructed through CMS habitat. Additionally, conditions should improve as the Refuge proposes to revegetate edges of trails to improve habitat on Powderline and Three-Mile cross-country ski trails. Other techniques to facilitate salamander crossing of these trails will be considered as well including raised "boardwalks" which will provide cover, increase humidities and eliminate exotic vegetation currently growing on these trails.

Public use on Powderline and Three-Mile Trail only occurs during winter months by cross-country skiing and snow shoe access when there is snow on the ground. During these times of year, salamanders are not active and are underground (USFWS 2009). Furthermore, because these trails are not open to the public outside of the winter time, the trails and the substrate on the trails remain undisturbed during the time of year when the salamanders are active. Therefore these public uses are not likely to adversely affect CMS

These old roads, now public use ski trails, have an altered micro-habitat and are not habitat for CMS; therefore, we do not expect this species to be living in these trails. Therefore, the potential for CMS to be present on the trails is limited to salamanders occasionally crossing the trail.

Salamanders may cross the trail in low numbers until temperatures drop and the salamanders are no longer active and present on the surface. Their presence on the surface is temperature and moisture dependent, thus dates of emergence and submergence depend on these environmental factors and can vary from year to year (Pauley 1978a; 1978b; Pauley 2005 in Pauley 2008). It is estimated that when temperatures are below 55 ° F salamanders are not likely to be active on the surface (USFWS 1991). Based on climate information from 1948 to 2000, average temperatures in Canaan Valley do not exceed 55 ° F until May 14 and fall below 55°F after September 26 (Brooks pers. comm.). Under the current conditions of the special-use permit, maintenance operations can only occur between October 10 and April 30. This is well beyond when salamanders are likely to be present on the surface. Therefore the chance of direct take is extremely unlikely (discountable).

The chance of direct take from maintenance activities is further limited due to the expected low amount of active maintenance conducted on these trail sections. Maintenance typically occurs on one to two days a year on these higher elevations trails and consists of hand crews with one all-terrain vehicle (ATV) and trailer to haul equipment. ATV use is limited to usually two passes up and down the trail to move tools (Chase, pers.comm). Maintenance activities typically include the removal of downed trees and limbs which have fallen across the trail during the previous season and maintaining existing water bars to prevent erosion. The risk of the maintenance crew encountering a salamander is extremely unlikely to occur (discountable).

Trails have been noted impediments to CMS movements, possibly fragmenting and genetically isolating populations as well as making these populations more vulnerable to stochastic events. Pauley (unpubl. data in Service 1991) found that roads, and potentially some trails, serve as barriers that prevent territories of different individuals from overlapping, thus fragmenting populations and

gene pools. Heavily traveled trails can result in removal of leaves and other forest litter, leaving bare trail treads (USFWS 1991; WVDNR 2000, 1999). Preliminary data suggest that CMS rarely cross trails and other openings that lack sufficient leaf litter cover (Pauley 2005 in Pauley and Waldron 2008). CMS use forest floor litter as foraging cover and refugia, especially during the day. Therefore, the extent to which trails and roads serve as a barrier to CMS most likely depends on the site-specific characteristics such as width, canopy cover, substrate material, compaction, and level/type of use. Conditions related to blocking movements for salamanders appear to be related to increased temperature and humidity resulting from an open tree canopy as well as the removal of vegetation and leaf litter through public use activities creating bare soil conditions. The cross country ski trails that White Grass maintains are not used outside the ski season for public use and are not heavily traveled. Therefore excessive trampling resulting in the removal of litter and vegetation to create bare dirt surfaces does not occur on these trails. Because habitat on the trail is predominately grass and fern cover with limited rock and woody debris, it likely permits salamanders to move across the trail. In addition, both Powderline and Three-Mile trails are narrow and have partial canopy cover providing shading and cooling effects to the trail surface. This creates more suitable conditions for salamanders to move across the trail. The lack of bare soil conditions coupled with the presence of canopy cover suggest that these trails do not create a barrier to salamander movement.

We do not expect the presence of these trails to fragment these populations creating genetic barriers. For this reason the trails are not likely to cause indirect adverse effects to CMS.

Planting native tree species such as red spruce along the trails would eventually provide a more closed canopy over the trail and improve substrate and vegetation on the trail itself. Native tree species would eventually shade out all of the grass and fern cover which currently dominates the trails, and would improve micro-habitat conditions for salamanders by increasing leaf litter, woody debris, and soil moisture (USFWS 1991). These trail improvements would provide a more conducive corridor for CMSs to move between upslope and down slope populations. Revegetation of Refuge cross-country ski trails and increasing canopy cover is an additional conservation measure the Refuge can accomplish to further enhance habitat conditions for the salamander.

In the future, the Refuge would also consider other options such as replacing trail segments with boardwalks to further facilitate salamander movement across trails. This action is one of the recommended management guidelines in the recovery plan for this species (USFWS 1991). In 2009, the Monongahela National Forest initiated a study to design more effective road and trail maintenance activities to benefit CMS populations (Pauley and Waldron 2008). If those results apply to habitats on the Canaan Valley NWR, the Refuge will consider implementation of similar measures.

Habitat management actions aimed at increasing the patch size, connectivity and structure of red spruce forest could adversely affect CMS. Silvicultural techniques to release understory spruce include girdling and small patch cuts to decrease canopy cover and allow understory spruce to gain the overstory. In the short term this action will increase light penetration to the forest floor increasing temperatures and decreasing humidities, both of which could affect CMS occupancy and distribution. Impacts can be minimized by reducing the number of trees girdled or felled to release understory spruce in areas occupied by CMSs. Planting may also impact CMSs by potential direct take through the action of using a dibble bar to plant trees. The Refuge's focus largely is to improve red spruce dominance and structure outside of occupied salamander habitat to increase the size of existing spruce cover and connect fragmented stands. This will lead to increased acreage of suitable habitat for the species and increase the species' resilience to stochastic events and long term climate change. To prevent adverse affects, any overstory cuts will have a minimum 300 foot buffer between occupied habitat and thinning operations. Areas targeted for silvicultural operations will be surveyed for CMS prior to any management action. Consultation and coordination with the WVFO will occur to prevent adverse impacts from occurring.

Strategies listed to achieve spruce management objectives 2.4 and 2.5 include:

- Improve habitat structure for Refuge focal species through thinning and/or other stand improvement operations. Methods would include, but are not limited to, girdling operations, single tree or group selection cuts of up to one-half acre in size with cutting cycles of 15 to 20 years, and reserved shelterwood cuts. All management locations will be inventoried for CMS presence prior to cutting. During planning we will consult closely with the WVFO and comply with the CMS Recovery Plan (USFWS 1991) recommendations when implementing cutting operations.

- Work with partners to experiment with silvicultural techniques that will increase long-term canopy dominance of red spruce.

- Plant spruce seedlings in high priority areas for regeneration in up to 20 acres per year.

- Collaborate with land management agencies and adjacent landowners to increase connectivity of spruce stands across management boundaries.

- Identify, connect, and enlarge spruce stands by under-planting existing vegetation with spruce seedlings.

With adequate surveys and consultation with the WVFO we predict that no adverse effects to this species will occur from the management strategies in the final CCP.

Indiana bat

Habitat management actions in the final CCP will complement the habitat needs of Indiana bats by increasing forested habitats, particularly along the riparian corridors of the Refuge. Adverse affects may occur through the management of edge hardwood forests for early successional habitat if those areas are used as roosts by Indiana bats. Currently, there are no documented occurrences of Indiana bats in the north end of the Refuge where much of the edge hardwood cutting is proposed. Increasing the surveys for Indiana bats in these areas will provide better information on the use and distribution of Indiana bats in Refuge habitats. Surveys for Indiana bats during summer months will focus on documentation of roost and foraging sites. To prevent adverse affects, clearing of hardwood habitats will be restricted to those areas which have been surveyed and determined to not be used as roosting or foraging sites for Indiana bats. The Refuge will work with the WVFO to develop appropriate survey protocols and management strategies to protect and enhance Indiana bat habitat on Refuge land.

With adequate surveys and consultation with the WVFO we predict that no adverse effects to this species will occur from management strategies in the final CCP.

B. Explanation of actions to be implemented to reduce adverse effects: N/A

VIII. Effect determination and response requested: [* = optional]

A. Listed species/designated critical habitat:

Determination	Response requested
no effect/no adverse modification	____ *Concurrence
may affect, but is not likely to adversely affect species/adversely modify critical habitat **Cheat Mountain salamander (*Plethodon netting*)** **Indiana Bat (*Myotis sodalis*)**	✓ Concurrence
may affect, and is likely to adversely affect species/adversely modify critical habitat (species:_____)	____ Formal Consultation

B. Proposed species/proposed critical habitat:

Determination	Response requested
no effect on proposed species/no adverse modification of proposed critical habitat (species:_____)	____ *Concurrence
is likely to jeopardize proposed species/ adversely modify proposed critical habitat (species:_____)	____ Conference

C. Candidate species:

Determination	Response requested
no effect (species:_____)	____ *Concurrence
is likely to jeopardize candidate species (species:_____)	____ Conference

Kenneth K. Patton
Project Biologist (Requestor)

2/14/2011
Date

IX. Reviewing ESFO Evaluation:

A. Concurrence ✓ **Nonconcurrence**____

B. Formal consultation required____

C. Conference required____

D. Informal conference required____

E. Remarks (attach additional pages as needed):

Barbara Douglas — 2/14/2011

Endangered Species Biologist (Reviewer), West Virginia Field Office — Date

Deborah Carter — 2/15/2011

Supervisor, West Virginia Field Office — Date

Appendix I

Marquette Crockett/USFWS

Canaan Valley refuge staff and Youth Conservation Corps working on Forest Road 80

Consultation and Coordination with Others

- **Background**
- **Public Involvement Summary and Outreach**
- **Release of Draft CCP/EA**

Background

We presented in chapter 2, figure 2.1, the steps in the comprehensive conservation planning process and how it integrates National Environmental Policy Act (NEPA) requirements including public involvement. What follows is the chronology of public outreach activities the U.S. Fish and Wildlife Service (Service) conducted while preparing the draft comprehensive conservation plan and environmental assessment.

Public Involvement Summary and Outreach

Planning Updates, Issues Workbook, and other Newsletters

January 2006	Article in Timberdoodle Newsletter and Highland Voice.
June 2006	Article in Timberdoodle Newsletter and posted web page on Comprehensive Conservation Plan (CCP) process.
September 2006	Distributed the issues workbook and planning newsletter to approximately 2,000 names on our mailing list, and posted it online for people to complete electronically. We also sent the workbook out by e-mail to our stakeholders mailing list, which was developed by the refuge and United States Geological Survey (USGS).
March 2007	USGS conducted stakeholder interviews and assessments with 63 participants.
February 2008	Distributed the Executive Summary of USGS stakeholder evaluation and presented findings to interview participants at Canaan Valley State Park (2/27/09) and to the general public at an open house at the Canaan Valley Fire Hall (2/28/09).
February 2008	Distributed a Planning Update
February 2009	Distributed a Planning Update
May 2010	Distributed a Planning Update announcing the release of the draft CCP/EA

Public Scoping Meetings – Meeting our Refuge Neighbors at Open Houses

October 12, 2006
Number of non-Service attendants: 6
Location: Elkins, WV

October 13, 2006
Number of non-Service attendants: 6
Location: Parsons, WV

October 14, 2006
Number of non-Service attendants: 16
Location: Thomas, WV

January 30, 2007
Number of non-Service attendants: 27
Location: Canaan Valley, WV

Updating Various Constituents on our Progress

The refuge has provided updates on the CCP process to the local community and other constituents through a variety of methods. Articles have been written for local newsletters including the Timberdoodle (Refuge Friends Group) and the Highlands Voice (West Virginia Highlands Conservancy). Outreach by partners has been completed with such groups as the National Wild Turkey Federation, WV Birders Listserv, NRA Institute for Legislative Action, and the Brooks Bird Club. News releases have preceded all public meetings and open houses. Regular

updates on the refuge website have included new information on the CCP process. Flyers were also posted in local community businesses preceding all public meetings and open houses. Personal communications have been continuous at refuge public events and programs. Communication has also been delivered via presentations at Rotary and other community meetings.

Meetings with State Partners and Other Conservation Experts

December 7-8, 2006
Outreach activity: Planning Meeting
Purpose: Convene the core planning team for the first time
Number of non-Service attendants: 1
Audience: Core planning team

January 19, 2007
Outreach activity: Planning Meeting
Purpose: Discuss rare plant and rare community conservation and management strategies
Number of non-Service attendants: 6
Number of Service attendants: 6
Audience: West Virginia Division of Natural Resources (Keith Krantz, Jim Vanderhorst, P.J. Harmon, and Elizabeth Byers), The West Virginia Chapter of the Nature Conservancy (Rodney Bartgis), and West Virginia University (Jim Rentch)

February 20, 2007
Outreach activity: Planning Meeting
Purpose: Discuss migratory bird conservation and habitat management strategies
Number of non-Service attendants: 8
Number of Service attendants: 8
Audience: Canaan Valley Institute (Jim Rawson), Monongahela National Forest (Cathy Johnson), Northern Research Station (Jane Rodrigue and Melissa Thoms-Van Gundy), West Virginia University (Jim Anderson), and West Virginia Division of Natural Resources (Steve Wilson, Keith Krantz and Jim Evans)

May 18, 2007
Outreach activity: Planning Meeting
Purpose: Discuss deer management strategies
Number of non-Service attendants: 9
Number of Service attendants: 5
Audience: West Virginia Division of Natural Resources (Keith Krantz, Gary Foster, and Dick Hall), Timberline Homeowners Association (Jaineay Brasselle), West Virginia University (Kelley Flaherty), Canaan Valley State Park (Rob Gilligan), USFS Northern Research Station (Tom Schuler and Mark Ford), and Canaan Valley Institute (Ken Dzaack)

July 12, 2007
Outreach activity: Planning Meeting
Purpose: Discuss visitor services outreach, education, and other public use strategies
Number of non-Service attendants: 18
Number of Service attendants: 6
Audience: Appalachian Forest Heritage Area (Phyllis Baxter), Trout Unlimited (Gary Berti), Tucker County Trails (Linda Blakeley), White Grass Ski Touring (Chip Chase), Canaan Valley Institute (Cindy Phillips), Guest Services- CVSP (David Cooper), Tucker County School Board (Bob Dunkerly), Tucker County Connections (Julie Dzaack), West Virginia Division of Natural Resources (Jim Fregonera), National Park Service (Peggy Pings), Davis and Elkins College (Ed Rhudy), West Virginia University (David Smaldone), Friends of the 500th (Marilyn Schoenfeld), Tucker County Convention and Visitors Bureau (Bill Smith), West Virginia Highlands Conservancy (Dave Saville), and West Virginia Department of Transportation (Jim Hudson)

December 10, 2007
Outreach activity: Planning Meeting
Purpose: For refuge staff to hear outcomes of the contracted feasibility study for a cross-valley trail and provide feedback to the contractors on the desired products from the study
Number of non-Service attendants: 2 VHB contractors, 2 Canaan Valley Institute employees (Ken Dzaack and Jenny Newland).
Audience: Refuge staff and core planning team

December 11, 2007
Outreach activity: Conference Call
Purpose: To learn the results of the USGS stakeholder evaluation conducted by USGS
Number of non-Service attendants: 3
Number of Service attendants: 6
Audience: Refuge and Regional Office staff, West Virginia DNR.

October 30, 2006; May 15, 2007; October 16, 2007; April 18, 2008
Outreach activity: Land Protection Partners meetings
Purpose: Update the Canaan Valley Land Protection Partners on the CCP process
Number of non-Service attendants: approximately 8-10 at any given meeting
Audience: Refuge and Regional Office staff and people who were interested and involved in protecting land in Canaan Valley

October 3, 2008
Outreach activity: Canaan Valley refuge staff and Regional Chief meet with West Virginia Division of Natural Resources (WVDNR) in Parkersburg
Purpose: Discuss hunting and Research Natural Area Issues with State.
Number of non-Service attendants: 3
Number of Service attendants: 2
Audience: WVDNR (Frank Jezioro, Curtis Taylor, Keith Krantz)

October 18, 2008
Outreach activity: Canaan Valley refuge staff meet with WVDNR at Ohio River Islands National Wildlife Refuge
Purpose: Discuss CCP update.
Number of non-Service attendants: 1
Audience: Curtis Taylor, WVDNR

August 20, 2009
Outreach activity: Planning meeting
Purpose: To discuss the State's comments on the preliminary draft CCP/ Environmental Assessment (EA)
Number of non-Service attendants: 3
Number of Service attendants: 5
Audience: Gary Foster, Roger Anderson and Keith Krantz, all of the WVDNR

September 14, 2010
Outreach activity: Planning meeting
Purpose: To discuss the State's comments on the draft CCP/EA
Number of non-Service attendants: 3
Number of Service attendants: 4
Audience: Gary Foster, Roger Anderson and Keith Krantz, all of the WVDNR

Briefing Elected Officials and Others

March 26, 2008 WV Senators and State Representative

Issues Meetings
From February through March 2008, the core planning team met to discuss many of the issues that are listed in Chapter 1. The State representative to the core planning team was invited to every one of these meetings and he attended almost all of them. Issues discussed included hunting, trapping, Delta 13/Camp 70 Road, off-road vehicle access, off-trail skiing at White Grass, competitive races on Forest Road 80, and the impacts of White Grass ski trails on Cheat Mountain salamanders.

Release of Draft CCP/EA

In May 2010 we completed and released the draft CCP/EA for a 45-day public review and comment. In addition, we held a public meeting/open house on the following dates at the following locations:

Tuesday, June 15, 2010, 2-4 p.m.
Location: Canaan Valley, WV
Number of non-Service attendants: 30

Tuesday, June 15, 2010, 6:30-8:30 p.m.
Location: Canaan Valley, WV
Number of non-Service attendants: 50

Wednesday, June 16, 2010, 2-4 p.m.
Location: Parsons, WV
Number of non-Service attendants: 8

Wednesday, June 16, 2010, 6:30-8:30 p.m.
Location: Parsons, WV
Number of non-Service attendants: 5

Thursday, June 17, 2010, 2-4 p.m.
Location: Elkins, WV
Number of non-Service attendants: 15

Thursday, June 17, 2010, 6:30-8:30 p.m.
Location: Elkins, WV
Number of non-Service attendants: 10

Monday, June 28, 2010, 6:30-8:30 p.m.
Location: Davis, WV
Number of non-Service attendants: 30

We analyzed all of the comments on the draft CCP/EA we received during its 45-day public review, and applied them when we revised our final CCP. Appendix J summarizes those public comments and our responses to them. Each year, we will evaluate our accomplishments on the refuge in accordance with the alternative selected in our final CCP. We may intensify refuge monitoring without additional NEPA compliance. Any results of our future monitoring that predict a new, significant impact, however, would require our analysis and public involvement in an additional Environmental Assessment. requirements and advances the purpose of the refuge and the mission of the National Wildlife Refuge System. Both documents will be available to all interested parties. After publication we can implement the plan.

Each year, we will evaluate our accomplishments on the refuge in accordance with the alternative selected in our final CCP. We may intensify refuge monitoring without additional NEPA compliance. Any results of our future monitoring that predict a new, significant impact, however, would require our analysis and public involvement in an additional Environmental Assessment.

Appendix J

Steve Hildebrand/USFWS

Whitetail deer

Summary of Public Comments and Service Responses on the Draft Comprehensive Conservation Plan and Environmental Assessment for Canaan Valley National Wildlife Refuge

- Introduction
- Summary of Comments Received

Introduction

In May 2010, we completed the draft Comprehensive Conservation Plan and Environmental Assessment (draft CCP/EA) for Canaan Valley National Wildlife Refuge. That draft outlines four alternatives for managing the refuge over the next 15 years, and identifies alternative B as the "Service-preferred Alternative." We released the draft for 45 days of public review from June 1 to July 16, 2010.

We evaluated all the letters and e-mails we received and the oral testimony we recorded in our public hearings during that period. This document summarizes the public comments that raised issues and concerns within the scope of this final CCP and our responses to them. Based on our analysis in the draft CCP/EA and our evaluation of those comments, we have modified alternative B. These modifications take the form of additions, corrections, or clarifications, which we have incorporated into this final CCP. We have also determined that none of these modifications warrants our publishing a revised or amended draft before publishing the final CCP.

There are some important changes in the final CCP:

(1) A new map, labeled "Map 4.2, Public Use", and located in Chapter 4, clarifies our proposal to connect the Swinging Bridge Trail to Cortland Road. This proposed trail connection will require further NEPA analysis and public review before a final route is selected. Therefore, the new map in the final CCP shows the general area within which we hope to build this trail connection, rather than an actual line on a map, as was shown in the draft CCP/EA.

(2) In the final CCP, we will work with WV Department of Highway (WVDOH) to develop a plan for improving Camp 70/Delta 13 for access by pedestrians, biking, horseback riding, *and vehicles* (see the final CCP, Chapter 4, objective 4.3). Vehicle access on Camp 70 was proposed in alternative C of the draft CCP/EA, but not in alternative B. Due to public comment in support of vehicle access on this road, we decided to include this action in the final CCP. Although we discussed some of the potential impacts of this action in the draft CCP/EA, we will need to conduct additional detailed analysis on this action before it is implemented.

(3) In the final CCP, we changed the language of objective 3.1 to state that 75 percent of the 114 acres of aspen woodland will be managed in the 0-15 year age class. We removed language in the strategies identifying the annual target for cutting and replaced this with a statement that identifies the aging nature of the 114 acres of aspen communities requiring accelerated management if these communities are to be maintained as aspen habitat. We also included language in objective 3.1 that identifies the need for the management and conservation of aspen communities not identified in the CCP due to limitations of existing vegetative mapping coverage.

(4) In the final CCP, we changed language in objective 3.2, regarding northern hardwood forest edge cutting, so that no annual limits are put on this type of cutting. Limitations presented in the draft CCP/EA reflected considerations for available personnel to conduct activities during the appropriate seasons as well as seasonal access restrictions. However, given previous conversations with WVDNR and other partners, we believe that opportunities exist to help achieve management of this habitat over the life of the CCP. As such, the refuge will not state maximum annual acres, which would limit our ability to conduct hardwood forest edge cuts and would limit opportunities to work with partners over the life of the CCP.

(5) In objective 3.3 of the final CCP, we moved the identification process for dry alder communities to the 1-3 year time frame to prioritize locations for effective alder management. These dry alder communities will be identified prior to any habitat management plan.

Our Regional Director will sign a Finding of No Significant Impact (FONSI) (appendix K), which certifies that this final CCP has met agency compliance requirements, and will achieve refuge purposes and help fulfill the Refuge System mission. It also documents his determination that implementing this CCP will not have a significant impact on the human environment and, therefore, an Environmental Impact Statement (EIS) is not required. We will make these documents available to all interested parties. Implementation can begin immediately.

Summary of Comments Received

Because of the volume of comments we received and our interest in an objective analysis of them, we enlisted the U.S. Forest Service (the Forest Service) Recreation Solutions Enterprise Team in compiling a database and preparing a summary report. That team has particular expertise in providing unbiased summations of public comments on major proposals by Federal land management agencies, a process called content analysis. The team evaluated and coded all of our public letters, e-mails, and transcripts. We posted the summary report, which sorts the comments into subject headings by issue, on the website *http://www.fws.gov/northeast/planning/Canaan%20Valley/ccphome.html*. Our responses below follow the organization of their report, and we encourage a reading of it before reading our responses.

During the comment period, we received 312 responses, both oral and written. Organized response campaigns (forms) represent 35 percent (111) of that total.

We gathered oral comments in the following seven formal public hearings:

Tuesday, June 15, 2010, 2-4 p.m. and 6:30-8:30 p.m. in Canaan Valley, WV
Wednesday, June 16, 2010, 2-4 p.m. and 6:30-8:30 p.m. in Parsons, WV
Thursday, June 17, 2010, 2-4 p.m. and 6:30-8:30 p.m. in Elkins, WV
Monday, June 28, 2010, 6:30-8:30 p.m. in Davis WV.

Approximately 150 people attended the public hearings; 80 presented oral testimony, which we recorded and later transcribed. Some who attended the hearings submitted their comments in writing instead of as oral testimony, while others did both. We received written responses in 140 letters (some of which we also received as email), 90 e-mails, 1 fax and 1 telephone conversation.

We received comments from these government agencies and elected officials.

Mayor of Davis, West Virginia
Paul Burns, Tucker County Assessor, West Virginia
Pennsylvania Game Commission, Bureau of Wildlife Management
State Congressman, 46th District, WV House of Delegates
State Senator, 14th District, WV State Legislature
Tucker County Planning Commission, West Virginia
Governor's Office, West Virginia
West Virginia Division of Natural Resources
West Virginia Division of Culture and History

We also received comments from these individual or organizations:

8 recreational/conservation organizations
6 recreational associations
5 preservation/conservation organizations
4 businesses
1 hunting and fishing sports clubs
1 civic organization

In the discussions below, we address every comment the Forest Service report identifies. Occasionally, the Forest Service placed the same comment under two or more subject headings. In our responses, we often refer the reader to other places in this document where we address the same comment. Under a few subject headings, we introduce more detail on an issue than the Forest Service report provides. That was simply a matter of our knowing the issue in greater detail, or our having conversed with the person who submitted the comment.

Directly beneath each subject heading, you will see a list of unique letter ID numbers that correspond to the reviewer letters. The cross-referenced list appears as attachment 1 to this appendix.

In several instances, we refer to the full text version of the draft CCP/EA, or the final CCP, and indicate how the final CCP reflects our proposed changes. You have several options for obtaining the full text version of either the draft CCP/EA or the final CCP. They are available online at *http://www.fws.gov/northeast/planning/Canaan%20Valley/ccphome.html*. For a CD-ROM or a print copy, contact the refuge headquarters at:

Canaan Valley National Wildlife Refuge

6263 Appalachian Hwy.
Davis, WV 26260
Phone: (304) 866-3858
Fax: (304) 866-3852
E-mail: Canaanvalley@fws.gov

1.0 Planning

1.1 NEPA Process

(Letter ID#: 137)

Comment: There was one comment about the NEPA process. This came from a public hearing and may actually have been a response from a panel member. At times the participants were not identified. In general the comment was concerned with adherence to NEPA and the need to follow its guidance.

Response: No response required.

1.11 Public Involvement

(Letter ID#: 60, 68, 69, 70, 81, 84, 97, 126, 127, 131, 135, 142, 146, 147, 148, 149, 154, 164, 179, 194, 201)

Comment: Over twenty people commented on public involvement and generally wanted the refuge to continue to or enhance their efforts to keep people informed of its activities and intentions. One person suggested a newsletter; others suggested open houses; others suggested more meetings; and still others suggested field trips. One person also mentioned they knew about the refuge trail proposals for a long time and challenged folks who thought the refuge didn't work hard enough to inform the public.

Response: We will strive to do all we can to increase and enhance communication with the general public. Goal 5 in the final CCP provides details on how we plan to do this over the next 15 years.

1.12 Comment Period

(Letter ID#: 27, 30, 60, 73, 74, 115, 116, 117, 133, 153, 179, 186, 188)

Comment: Thirteen individuals wanted the comment period extended. Nearly all felt that due to the length and complexity of the document; 45 days was simply not enough time to thoroughly read the document and then contemplate and develop comments. One person wanted a summary of how the comments would be categorized and others wanted to know how the comments would be weighed or utilized by the Fish and Wildlife Service.

Response: We understand and appreciate the public's concern about the time limitations for submitting comments, given the length and complexity of the document. For this reason, we developed an Executive Summary of the document as well as summary tables to help readers sift through draft CCP/EA. We feel that this effort, coupled with the seven public meetings that we offered, should have enabled members of the public to submit comments within the allotted 45-day comment period.

The introduction to this appendix summarizes how comments were categorized and how they were utilized. The Service does not "weigh" comments.

1.13 Request for Information or Meeting

(Letter ID#: 6, 22, 28, 29, 30, 31, 32, 37, 61, 97)

Comment: Several people asked for a CD or hard copy of the Canaan draft CCP/EA. Several others wanted better copies of the maps or figures or tables contained within the document. A few individuals simply asked to be kept informed about the progress and decisions made during the CCP planning process.

Response: We have accommodated all requests for paper and electronic copies of the draft CCP/EA. We will do our best to continue to keep interested persons informed as we take steps towards implementing the final CCP.

1.2 Document (Clarity, Technical, Editorial, Availability)

(Letter ID#: 13, 22, 29, 60, 74, 75, 132, 133, 171, 175, 205)

Comment: One person commented that the document was informative and educational. One respondent wanted a table within the document listing the trust species. Many people requested better quality maps and figures stating that the maps and figures in the document were inadequate. Many people were very concerned with the refuge's proposed trail route near private property and wanted to know where the trail would actually be located.

Response: We appreciate the comment about the document being informative and educational. Appendix A of the draft CCP/EA and of the final CCP lists the "Species of Conservation Concern". We acknowledge that the maps and figures posted online were difficult to read due to low resolution. However, we chose to post low resolution files so they would be easily downloaded. We responded to all requests for better quality figures and maps.

We acknowledge that many people were concerned about a proposed trail from Swinging Bridge to Cortland Road which may have appeared to run through private property, as it was shown on the public use map for alternative B in the draft CCP/EA. This proposed trail will require further NEPA analysis and public review before a final route is selected. Therefore, the map in the draft CCP/EA was only intended to show a general route for this proposed trail. For the final CCP, we have developed a new map which shows this trail as more of a concept rather than a definitive route. We apologize for this error.

Comment: Some specific comments about the document clarity were: "One of those, for instance, is regarding the partnership with the Beall Weather Station (sounds like) on the Beall tract and it references that having (inaudible) and NOAA (sounds like) data collection. That hasn't been the case since 2007. And so I'm just wondering…you know, there is that and another statement about…one of the plans indicates that the refuge would work with CVI to create an ADA accessible fishing platform along the Camp 70 road or on refuge property. There is an ADA accessible fishing platform already on Camp 70 road. So I'm just wondering about, you know, the accuracy of the statement about the NOAA site as well as with the fishing platform. Does that mean you are proposing to put another one or you overlooked that there is one there? ……. You know those are two…Things that are down there that I have already noticed. There may be others, there may not. ….. So maybe the question with that is, what is the process for ensuring the accuracy of the information generally?"

Response: As we explain in appendix B of the final CCP, the National Oceanic and Atmospheric Administration (NOAA) weather station was installed in 2000 on the Beall Tract. The purpose was to establish and use an air quality monitoring and research site by the National Oceanic and Atmospheric Administration (NOAA). The equipment on this site continues to gather information such as carbon dioxide flux, air temperatures, soil temperatures, and soil moisture at various depths. Equipment for mercury monitoring has been moved to Canaan Valley Institute (CVI) land.

We have decided to remove the strategy from the draft CCP/EA, Alternative B, that reads, "Work with Canaan Valley Institute (CVI) to construct an ADA-compliant fishing platform on Camp 70 Road, on the Service's property or on CVI's property." Since the refuge now has an ADA-compliant fishing platform on Timberline Road, and CVI has an ADA-compliant fishing platform on Camp 70 Road, we have decided not to proceed with a third ADA-compliant fishing platform on the refuge at this time.

The draft CCP/EA goes through an internal review process as well as a public review process. Both these processes provide opportunities for checking the accuracy of the document before the final CCP is compiled and distributed. Although we always strive for 100 percent accuracy in all our documents, this is not something we can guarantee.

Comment: The same respondent also wrote: "And some grammatical and/or typographic errors I noticed in the full document:

Pg 2-6 4: Elkins is located in the northern tip…

Pg 2-7 2: Parsons is located…on the Shavers Fork…

Pg 2-14 3: Forrest is misspelled.

Page 3-13: photo caption: Prescribed burnv is misspelled.

Page 3-84: Bullet 8: Map B-4 is referenced when it should be Map B-2 on page B-58.

Page 4-38: photo caption: You probably mean electrofishing, and where is crayfish run??

Page B-27: Refuge Manager costs referenced ($1360.00 for five work days) contradict those costs referenced on page B-47 ($450.24 for one work day – which would equal $2251.20).

Page B-38 3: I think the Cheat Mountain Salamander is active when surface temperatures are above 55°F not 550F.

Appendix A Cover Page: What is "Umbagog Lake"? Should this caption be "Cheat Mountain Salamander"? Perhaps the Umbagog National Wildlife Refuge CCP was used as the template for this CCP and this text change was overlooked."

Response: The above errors were corrected in the final CCP.

Comment: One respondent wanted the refuge to document its claims or findings:

- Page 2-38: Wildlife –Dependent Recreation: Please document the sources (in an easy to read table form) for the 20,000 number referenced as the number of people visiting the refuge each year.

Response: This number is an estimate based on partial data that includes Visitor Center visits, White Grass Ski Touring Center visits, hunter days, and two traffic counters that operate part of the year. This data is pooled together and is used to make an educated estimate on the number of annual visits to the refuge. This is also the number that is used in the refuge's annual reports.

- Page 2-38 through 2-43: Educational and Recreational Opportunities: Please document within this section the FWS policy for Interpretation, Fishing and Environmental Education as you have for Wildlife Observation and Photography and Hunting.

Response: We were able to document the guiding principles for everything except Interpretation, because the policy does not list any guiding principles for Interpretation on refuges.

- Page 2-38 and 2-43: Wildlife Observation & Photography and Hunting: Both of these opportunities share similar guiding principles yet they are handled very differently within all of the management alternatives. This is most obvious with unlimited off trail access for hunting, yet no off trail access or very limited off trail access for Wildlife Observation & Photography as proposed in Alternative C. Please provide the process and/or science for this management direction. Off trail access for any compatible pedestrian purpose during the same seasons for which off trail pedestrian access for hunting is deemed compatible and justified would have the same, or less, impact to the environment, including its habitats and wildlife, as hunting."

Response: Although we proposed in alternative C of the draft CCP/EA to allow limited off-trail access, we did not include this proposal in the final CCP. We understand the argument that if off-trail access is allowed for hunting, it should be allowed for wildlife observation and photography. However, we believe we could not offer a high-quality hunting experience without offering off-trail access, whereas we can, and do still offer a high-quality wildlife observation and photography experience without off-trail access. The process for this management direction is documented in the compatibility determination for Wildlife Observation, Photography, Environmental Education, and Interpretation, and in the compatibility determination for hunting, all located in appendix B.

1.3 Service and Refuge System Policies

(Letter ID#: 42)

Comment: One person commented that the time frame for policy implementation should be shortened from five years to two years.

Response: We strive to establish reasonable timeframes for accomplishing actions in the CCP. A two-year timeframe for implementing policy is not always reasonable. Therefore, we will not make any changes to the timeframes related to policy implementation.

1.4 Refuge Operational Plans (Step Down Plans)

(Letter ID#: 75, 95, 111, 113, 116, 134, 175)

Comment: Commenters wanted a detailed HMP to be in place to guide refuge silvicultural practices. Others wanted a plan to address future public access needs. Another commenter wanted to know what things within step down plans could be implemented and if there was a schedule for those details. Yet another commenter wanted to know why there wasn't a wildlife management plan yet after 15 years of refuge operation. One person asked if the refuge consulted for their forest management goals.

Response: Chapter 1 of the final CCP lists all the step-down management plans that are either up-to-date or that need to be completed. Step-down plans that have gone through the appropriate approval process are currently being implemented according to the timeframes laid out in each plan.

The refuge does, in fact, have a plan that guides wildlife and habitat management. Refuges operate from annual habitat management plans designed around the most recent station management plan, Environmental Assessment or Environmental Impact Statement guiding the management of refuge habitats. Annual management plans outline locations and acreages of habitat manipulations such as shrub and grassland mowing and are reviewed and approved annually by the refuge manager. This process will continue after the CCP only with the new added guidance of the refuge's new management plan as described in the preferred alternative.

The refuge did, indeed, consult biological experts to help develop forest management goals.

1.5 Plan Amendment and Revision

There were no comments in this category.

1.6 Comprehensive Conservation Planning Process

(Letter ID#: 106, 131, 143, 152)

Comment: Several people commented that they appreciated the refuge's effort in the planning process and felt the plan had something of benefit for everyone. One person wanted to know if this was the first stage in the plan development. Another person wanted to know who makes the ultimate decisions concerning the plan.

Response: We are pleased that some people feel this plan is beneficial. This is not the first stage of plan development, but rather the culmination of several years of gathering public and expert input and developing the plan. As we explain in Chapter 2 of the final CCP, our Regional Director makes the ultimate decision by signing a Finding of No Significant Impact (FONSI), which certifies that this final CCP has met agency compliance requirements, and will achieve refuge purposes and help fulfill the Refuge System mission. It also documents his determination that implementing this CCP will not have a significant impact on the human environment and, therefore, an Environmental Impact Statement (EIS) is not required. The FONSI is attached to the final CCP as appendix K.

1.7 Purpose and Need

There were no comments in this category.

1.71 Vision

(Letter ID#: 3, 14, 41, 52)

Comment: Less than five people commented on the refuge's vision for the future. Respondents encouraged the refuge to continue to be good stewards and to actively manage the lands entrusted to it. One commenter was concerned that the refuge was having a paradigm shift in its basic mission statement.

Response: We appreciate the encouragement to be good stewards, and we disagree that the refuge is undergoing a paradigm shift in its basic mission statement.

1.72 Goals

(Letter ID#: 13, 53, 60, 99, 175)

Comment: A few people commented on refuge goals. One person complimented the refuge on its lofty goals and felt that strategies should be prioritized. An opposite viewpoint was expressed by a respondent who felt the refuge goals sounded contradictory and sounded like an opportunity for over manipulation. Another person felt that management should be adaptable, but also felt the refuge staff has "moved from one trend to another without good science to support the move." A respondent suggested the refuge always replace a restriction with an opportunity and wrote, "For example: Establishing the Research Natural Area in the heart of the valley and restricting access to it, and in return establishing more trail open to multi-use in other areas of the refuge. I would suggest adding a chapter to the CCP outlining the "exchanges" proposed in this CCP."

Response: As described in chapter 4 of the final CCP, developing refuge goals was one of the first steps in our planning process. Goals are intentionally broad, descriptive statements of the desired future condition for refuge resources. By design, they are less quantitative, and more prescriptive, in defining the targets of our management. They also articulate the principal elements of refuge purposes and our vision statement and provide a foundation for developing specific management objectives and strategies. We feel the goals in the final CCP accomplish this.

We are not required by any regulation or policy to provide a new recreational opportunity whenever we restrict an existing recreational opportunity, and we do not intend to do so in the final CCP.

1.73 Issues and Opportunities

There were no comments in this category.

1.8 Out of Scope

(Letter ID#: 4)

Comment: One respondent wrote about people's rights to have guns.

Response: Comment noted.

1.9 Attachments

Twenty one people attached a document containing their comments to an email sent to the Fish and Wildlife Service. One person attached a map to their email. All attachments were reviewed by the Service and considered in the public comment process.

2.0 Physical Environment

(Letter ID# 162)

Comment: One comment was placed in this category as it was an introduction to their specific comments about the refuge.

Response: No response required.

2.1 Global Climate Change

(Letter ID#: 13, 82, 176)

Comment: Three respondents commented on climate change. One wanted the refuge to ensure continuous forest. Another wrote: "In the climate change section of the "Actions Common to All Alternatives, Chapter 3-14", it says models show a projected July temperature increase by 50 F. This number seems unrealistic. Is it a typo for 5 degrees F?" Finally, another commenter questioned whether a 5000-6000 acre patch of forest would really affect climate change.

Response: Goal 2 in the final CCP states our objectives and strategies for managing forested habitats. The 50 F is an error. We changed this in the final CCP to 5 F.

The refuge agrees that small forest patches can not affect the overall course of a changing climate. However, as we discuss in Chapter 4 of the final CCP, there are ways the refuge can plan for projected changes in temperature and precipitation patterns to mitigate the possible effects of climate change on refuge lands and between refuge lands and other protected lands adjacent to the refuge. For example, increasing connectivity of forested habitat, such as red spruce forests, within the refuge and between the refuge and other lands can help create corridors for animal movements in the high elevation areas. By creating a healthy and ecologically functional forest (large forest blocks, connectivity, low invasive species presence etc.) the refuge can help create a forest that is more resilient to drought, temperature shifts and other stresses brought on with climate change. As we discuss in Chapter 4, the refuge can only adaptively manage habitats as climates change, and possibly predict stresses before they occur so that actions can be taken to mitigate the impacts.

2.2 Hydrology and Water Quality

There were no comments in this category.

2.3 Soils

(Letter ID#: 162, 195, 208)

Comment: Several people commented that the refuge take care not to disturb soils. One person related soil disturbance to carbon release stating, "Disturbing soils and exposing them to sunlight causes large releases of carbon into the atmosphere and degradation of the soils themselves. Soil disturbance increases erosion from wind and water. It degrades aquatic resources and harms wetlands. Many invasive species follow disturbed areas. Wildlife habitat and the flora are destroyed, as are scenic values. Management activities should always consider using the minimum impact tool rule. That is; what's the least disturbing method capable of achieving our goals? Carbon accounting should be considered in any activity that reduces forest canopy cover or disturbs soils."

Response: We agree with this comment. We take soil disturbance and vegetation clearing very seriously, and we always analyze the impacts of these types of actions before implementing them.

2.31 Erosion and Sediment

(Letter ID#: 174)

Comment: One person responded with data demonstrating that bicyclers do not have detrimental effects on soils compared to other user groups.

Response: We appreciate the submittal of this data. However, this information has not changed any of our decisions regarding the use of bicycles on the refuge. For a detailed map showing which trails we allow bicycling on, see Map 4-2.

2.4 Solid and Hazardous Waste Management

There were no comments in this category.

2.5 Air Quality

(Letter ID#: 175, 195)

Comment: One person wrote that the AIRMoN/NADP research component was moved from the Beall site in June 2007. Another person wrote that air quality: "you state air quality is "good." It is bad; it is the worst in the nation. Your Bearden Station pH is acid, and indicative of sulphuric acid from sulfer in the air that we breathe. You should post warnings about strenuous outdoor exercise as they do in the Smokies and Shenendoah National Parks where they get half the acid rain that you do. You should join them and the "Federal Land Managers (FLM-Air) Group" in studies (using CVI) and join in efforts to clean up our air. The spruce substrate is now acid, nutrient poor - impoverishing its site further until it falls and recycles."

Response: As stated in an earlier response, only some of the equipment associated with this weather station was moved in 2007. The rest of the equipment remains on the Beall tract.

We acknowledge in several places in the draft CCP/EA and the final CCP that air quality in Canaan Valley is less than desirable. For example, in chapter 3 of the final CCP, under the title "Climate," we state, "Recent research shows that the valley is impaired by both wet and dry sulfuric and nitric acid precipitation as well as high levels of ozone pollution." Despite the concerns about air quality in Canaan Valley, neither the refuge nor the Service has the expertise to conclude that warnings should be posted regarding poor air quality.

3.0 Socio Economic Setting

(Letter ID#: 175)

Comment: One person asked the refuge to provide a table of median income: "Table 2.3 on page 2-10, Regional Economic Setting, provides Income, Unemployment and Poverty Estimates for the closest communities to the refuge. For perspective, reference and convenient disclosure of public information, please include in the table the median income (or household income) for refuge employees. Based on calculations from information provided throughout appendix B in the full CCP document, this figure would be a minimum of $75,400 (with a range of $37,600 - $117,000). Also include in the text that refuge employees earn salaries well above (two to three times above) the local, State and national average for median household income. Also add this figure to Table H.3 on page H-4."

Response: We do not think this information is relevant to this plan and therefore we will not include it in the final CCP. However, appendix H in the draft CCP/EA discusses the total annual staff salaries under each alternative, and how this figure varies among the alternatives depending on different staffing scenarios. In addition, salaries of Federal employees are public knowledge. To calculate salaries, refer to the refuge staffing chart in appendix G and determine the relevant pay levels for the various General Service (GS) and Wage Grade (WG) employees.

3.1 Local Economy

(Letter ID#: 74, 160, 164, 175, 192)

Comment: Several people commented on the refuge's impact and contribution to the local economy. One person stated, "The refuge has kind of put us in a slump where it could either excel us, make us a better place for business, or it may hurt us and I think we can work with both of them to make both work." Similarly, another person stated that the refuge has aided in depleting Tucker County tax base. One person felt the refuge staff incomes should be included in the charts on incomes for the area. Another person thought refuge personnel living in Elkins was not beneficial to the local economy writing: "The statement, "The city of Elkins plays a major role in the economic impacts of the refuge because the majority of staff resides there" is misstated.

Response: We understand that many people are concerned with the government buying land because the government does not pay taxes on the land that it owns. However, as we describe in Chapter 3 of the final CCP, the refuge pays annual refuge revenue sharing payments to counties based on the acreage and the appraised value of refuge lands in their jurisdiction. These annual payments are calculated by a formula determined by Congress, which also appropriates funding. We will continue those payments in accordance with the law, commensurate with changes in the appraised market value of refuge lands, or new appropriation levels dictated by Congress.

Federal employee salaries are, indeed, included in Table 3.3, "Income, Employment and Poverty Estimates," in Chapter 3, "Affected Environment," in the section entitled "Regional Economic Setting" of the final CCP.

3.2 Property Value

(Letter ID#: 206)

Comment: Another person wanted the draft plan to assess the impact of Option B on property values.

Response: We assume that "Option B" means "Alternative B" from the draft CCP/EA. In any case, we are not assessors and therefore we do not have the expertise to assess property values. Rather, we suggest you talk to your town or county assessor.

3.3 Recreation and Tourism

There were no comments in this category.

4.0 Cultural Resources

(Letter ID#: 60, 196)

Comment: The West Virginia Division of Culture and History complimented the refuge on its willingness to protect or avoid disturbing historic resources and asked that if avoidance is not possible then mitigation efforts must be planned and adhered to. They applauded the refuge developing protocols for prehistoric and historic overview planning documents. One specific comment stated, "Of minor note, page 2-44 states that a project-oriented survey did not discover any sites, but did produce information about grave sites and historic structure foundations. Please know that structure foundations are considered archaeological sites by this office. Finally, we ask to receive copies of the overview studies and the 2007 report documenting the investigation of a subset of the potential historic sites for our records."

Response: Service archaeologists in the regional office keep an inventory of known sites and structures and ensure that we consider them in planning new ground disturbing or structure altering changes to the refuge. They consult with the West Virginia Division of Culture and History concerning projects which might affect sites and structures, and conduct archaeological or architectural surveys when needed. These activities will ensure we comply with section 106 of the National Historic Preservation Act.

We agree to send copies of the overview studies and the 2007 report.

Comment: The West Virginia Division of Culture and History requested the following changes:

"Architectural Resources:

We request that the following changes be made to the draft management plan. On pages 2-44 and 2-55 of the draft plan, the presence of architectural resources has been included in the general introduction as well as given a cursory mention under archaeological resources. We request that this be separated out and that any known architectural resources be addressed separately. At present, there is no indication if any architectural resources actually exist in the management area. There is only an indication that an archaeologist keeps a list of buildings and construction projects for potential effect to archaeological and architectural resources. On page 3-6, please also note that any evaluation of eligibility and effects on architectural resources must be completed by someone meeting the National Park Service's qualification standards for Architectural Historian. Please see http://www.nps.gov/history/local-law/arch_stnds_9.htm for further guidance on these standards."

Response: These changes have been made.

Comment: Another commenter complimented the refuge's commitment to cultural and historic preservation.

Response: Comment noted.

5.0 Refuge Administration

(Letter ID#: 60, 123, 175, 179)

Comment: A respondent wanted the refuge to continue its Youth Conservation Corp Program. Another wanted the refuge to increase efforts at communication with the local community. One person felt the Northeast Regional Office has mismanaged Canaan NWR.

Response: As stated in the final CCP, we will maintain the Youth Conservation Corp program. We will also increase communication through various forms of media, including local television, the Internet, newspapers, and promotional advertising. The comment about mismanagement has been noted.

5.1 Land Acquisition

(Letter ID#: 43, 52, 60, 97, 98, 128, 129, 130, 132, 136, 142, 164, 175)

Comment: About 15 people commented on land acquisition. One person was concerned that as government agencies purchased more and more land, there would be less and less for individuals and less children in schools thus decreased school funding. Others were also concerned about the reduced tax base as the refuge acquired more land.

Response: As mentioned previously under the section, "3.1 Local Economy," we understand that many people are concerned with the government buying land because the government does not pay taxes on the land that it owns. However, as we describe in Chapter 3 of the final CCP, the refuge pays annual refuge revenue sharing payments to counties based on the acreage and the appraised value of refuge lands in their jurisdiction. These annual payments are calculated by a formula determined by Congress, which also appropriates funding. We will continue those payments in accordance with the law, commensurate with changes in the appraised market value of refuge lands, or new appropriation levels dictated by Congress.

Comment: One person asked if the land acquisition funding carried over year to year.

Response: Funding for land acquisition at Canaan Valley NWR largely comes from the Land and Water Conservation Fund. While money from this fund can carry over from year to year, the longer it carries over, the greater probability that the money will be taken away from the refuge and used for other purposes.

Comment: Several people wanted the refuge to acquire more land as necessary to preserve natural resources.

Response: Comment noted.

Comment: One person who opposed land acquisition stated, "I strongly oppose any further land acquisition including easements which are being held for the service in Canaan Valley, except for NWI qualifying wetlands, until revenue sharing payments since 1995 are paid in full. It is a shame that the USFWS gets away with not paying its promised commitment to the community, and still actively pursues gaining additional property that will increase the debt the service has not been able to alleviate. Any funding secured for land acquisition for CVNWR should be designated to bringing the revenue sharing payments to a "paid in full" status. I know this is a repeat of an earlier comment but there are a lot of folks in the community who feel the same way."

Response: We explained in appendix H of the draft CCP/EA that, under provisions of the Refuge Revenue Sharing (RRS) Act, local counties receive an annual payment for lands that have been purchased by full fee simple acquisition by the Service. Payments are based on the greater of 75 cents per acre or 75 percent of the fair market value of lands acquired by the Service. We reappraise refuge lands at least once every 5

years to ensure that those payments are based on market value. The exact amount of the annual payment depends on Congressional appropriations, which in recent years have tended to be less than the amount to fully fund the authorized level of payments. In fiscal year 2005 (FY05), actual RRS payments were 41 percent of authorized levels. This was the lowest percent Congress has funded since 1977. The 31-year average of revenue sharing payments is 68.08 percent, and the average payment for the last 10 years is 51.88 percent.

The refuge does not have the authority to increase appropriations for Refuge Revenue Sharing. Only Congress has that authority. However, the actual economic impact of refuge land acquisition is more complex than Refuge Revenue Sharing. For example, when we retain land as habitat, it reduces the need for the services each town provides and increases the revenue to local businesses from visitor, staff and refuge purchases. Those effects further mitigate the economic impacts on each town. We also believe that the towns around the refuge will continue to develop, further increasing their tax base.

5.2 Staffing and Budgets

(Letter ID#: 54, 58, 70, 71, 72, 80, 84, 89, 97, 98, 101, 136, 143, 170, 175, 202, 207)

Comment: Twenty people commented on refuge staffing and budget. Several individuals wanted to see additional staff added to the refuge such as a park ranger and biological technician. Several people also wanted to see a permanent Administrative Assistant at refuge headquarters.

Response: As stated in the final CCP, we will convert two temporary positions to permanent positions, and we will add four new staff members, including a park ranger and a biological technician.

Comment: One person wanted to see the visitor center open seven days a week year round and another wanted to accelerate the time table for staffing the visitor center to be within one year.

Response: As stated in the final CCP, we will open the Visitor Center seven days per week during times of peak visitation and at least three days a week during the rest of the year. The time table for staffing the visitor center will depend on when we are able to hire more staff.

Comment: Several people expressed their displeasure with staff personnel residing in Elkins. One person was stated, "I am very, very unhappy to hear all these people that work for the Wildlife Refuge in Canaan Valley comment and say that this area is not conducive for our wives, our kids. I raised five children here and this is very, very upsetting. We have anything that you want to do and the Wildlife Refuge provides that…hiking, biking, you know, skiing. There is everything here plus, you know, walking. There is a good school. We may not have a mall on the corner but certainly it would be much easier to drive to Elkins once a week and shop at a mall than it would be to drive back and forth every day and we have a very good school system here. …… And I would think that maybe these wives need to visit the valley more themselves and not just let their husbands come up here"

Response: Where members of the refuge staff choose to reside is a personal choice and this choice does not in any way reflect on the staff's dedication to Canaan Valley or to the refuge.

Comment: One person wanted to know if the current refuge budget was outlined in an appendix in the CCP. Several people wanted to know how the refuge planned to operate based on budget changes from year to year and others wanted to know how the budget was affected by alternative.

Response: Refuge staffing and budget figures from 2002-2008 are shown in chapter 3 of the final CCP. Refuge budgets change from year-to-year depending on fixed and one-time costs. The refuge responds to budget changes by prioritizing its management activities. Top management priorities are addressed first, and if funding allows, the refuge will address less urgent priorities. Appendix F in the draft CCP/EA offers a side-by-side comparison of the budget needs by alternative.

Comment: A commenter suggested that operational funding should be directed towards wildlife preservation and not towards education.

Response: The National Wildlife Refuge System Improvement Act defines wildlife observation, photography, environmental education, and interpretation as priority public uses that, if compatible, are to receive our enhanced consideration over other general public uses. Authorizing these uses provides opportunities for the public to enjoy wildlife and plants on the refuge in accordance with law, and it produces better-informed public advocates for Service programs.

The funding of habitat management and environmental education are not mutually exclusive. Therefore, we will continue to fund both at appropriate levels.

Comment: Voicing opposition to additional staffing a commenter wrote, "As a retired administrator of a natural resource agency where I supervised the operations of several similar areas and a former seasonal for your sister agency - the US Forest Service, I feel that I am somewhat qualified to assess the number of personnel. Due to the small amount of acreage, 17,000 now and at the most in the future, 24,000, and at least 4 months of low visitation and opportunities to do field work because of inclement weather, I can see no justification for additional staffing above the present level with the exception of a few seasonals."

Response: We present a staff of 12.5 in the final CCP. As stated in Chapter 4, this staffing level is the recommended number of positions in the 2008 staffing model. Staffing models were developed to answer the following basic question: "What level of staffing is needed to operate and manage a station to achieve the station's purpose, contribute to the mission and goals of the Refuge System, and comply with the Refuge Improvement Act and other laws, regulations, and policy?" Although these models solicited input from the refuge, they were ultimately developed for all refuges nationwide by our Washington office using objective frameworks. Therefore, this is the staffing model the refuge will continue to use.

5.3 Partnerships

(Letter ID#: 57, 87, 95, 97, 143, 162, 163, 174, 175, 177, 178, 187, 191, 208, 209)

Comment: Most of the comments encouraged the refuge to continue to foster partnerships with the local community, local businesses, other private organizations and other agencies. Several respondents offered assistance with trail construction and road maintenance.

Response: We appreciate this encouragement and offer of support.

Comment: One person wanted clarification concerning the refuge's working with private landowners to coordinate mowing.

Response: This comment is related to a proposed strategy in the draft CCP/EA which states that the refuge will work with private landowners and partners to encourage late haying and mowing of privately owned grasslands adjacent to refuge property. Refuge grasslands are integrally linked to surrounding private grassland habitat, and the ultimate success of grassland bird populations in the valley depends on all grasslands in the valley, not just refuge managed grasslands. Grasslands on the refuge are mowed later in the summer (late July) to help ensure that grassland birds will have an opportunity to raise one clutch of young before mowing occurs. By encouraging private landowners to similarly manage their grasslands, we can work together to help protect important fledging habitat for many of the valley's grassland birds.

5.4 Interagency Coordination

(Letter ID #: 189, 195)

Comment: One person asked the refuge to work with Canaan Valley State Park on a trail from the refuge center to connect with CVSP trails. Another person asked the refuge to work with parks to control the deer population.

Response: As stated in the final CCP, under objective 4.3, we will initiate discussions with the State's Parks and Recreation branch about the possibility of a trail connecting the refuge's Visitor Center to Canaan Valley State Park.

The Wildlife Resources Section of the West Virginia Division of Natural Resources manages deer (and other game) populations on properties throughout the State, including properties owned and managed by the State's Parks and Recreation Section. Although the refuge does not have the jurisdiction to control the deer population on State park lands, we are always willing to engage in broader discussions related to deer population control in Canaan Valley.

5.5 Revenue Sharing Payments

(Letter ID#: 13, 59, 60, 96, 128, 129, 165, 175)

Comment: Most of the commenters wanted the refuge to pay their taxes and pay in full their revenue sharing payments. One person wanted to know what percent of PLT is being paid now.

Another person wanted to know if there would be differing revenue based on the plan, stating, "I was wondering about the plan is kind of divided into more public use of the refuge and some of them are more protected lands of the refuge vs opening it up to other types of uses, off trail uses and things like that. Would that make a difference in revenue…"

Response: As an agency of the United States Government, the Service, is exempt from taxation. However, as stated above in our fourth response under "5.1 Land Acquisition", the Refuge Revenue Sharing Act states that local counties receive an annual payment for lands that have been purchased by full fee simple acquisition by the Service. The exact amount of the annual payment depends on Congressional appropriations, which in recent years have tended to be less than the amount to fully fund the authorized level of payments. In fiscal year 2005 (FY05), actual RRS payments were 41 percent of authorized levels, and they remained at this level through Fiscal Year 2007. This was the lowest percent Congress has funded since 1977. Figures for percentages beyond Fiscal Year 2007 were unavailable. The 31-year average of revenue sharing payments is 68.08 percent, and the average payment for the last 10 years is 51.88 percent. The refuge does not have the authority to increase appropriations for Refuge Revenue Sharing. Only Congress has that authority.

The final CCP will not affect Refuge Revenue Sharing payments.

5.6 Special Use Permits

(Letter ID#: 42, 53, 60, 90, 95, 97, 113, 114, 175, 187)

Comment: Several people questioned the feasibility of issuing more special use permits concerning the increased burden on staff and budget. Several people wanted to streamline the hunting permit system. One person wanted it to be on a lottery system.

Response: The final CCP does not significantly increase the amount of special use permits that will be issued by the refuge. A few new public uses such as rabbit hunting and parking overnight at Forest Road 80 will require a special use permit. However, we do not expect an overwhelming number of people to be requesting these special use permits and therefore we do not believe this will significantly increase the burden on the refuge.

Regarding a more streamlined system for hunting, we state in the final CCP under objective 4.1 that we will work towards implementing a simpler, streamlined permitting system for the refuge's hunting program.

Regarding lottery systems, these systems are typically used only when a refuge cannot accommodate the number of hunters who want to hunt on the refuge. Since this refuge can currently accommodate all hunters, there is no need to institute a lottery system at this time.

Comment: One person did not understand the need to obtain a special permit for rabbit hunting.

Response: In the final CCP we require that hunters obtain a special use permit for rabbit hunting. This special use permit will require that rabbit hunters turn in rabbit skulls to aid in the identification of eastern and Appalachian cottontails harvested on refuge lands.

Comment: Another person felt that whenever the refuge office is open, that permits should be available.

Response: The refuge makes every effort to make hunt permits available to the public. Hunt permits are issued automatically and sent out via mail when a hunter turns in his/her survey from the previous year. Permits are also available by calling the refuge office or via an email request system. Hunt permits are issued in person when refuge staff is available, but occasional staff meetings and other commitments may interfere with the availability of refuge staff.

Comment: Concerning overnight parking a respondent commented, "Allow overnight parking by permit on Forest Road 80 for visitors accessing and camping in Dolly Sods."

Response: The final CCP states that the refuge will allow overnight parking by permit on Forest Road 80 for visitors accessing and camping in Dolly Sods. Camping on the road or anywhere on the refuge is prohibited.

Comment: A respondent wanted the winter access bid process to be fine tuned and clarified. On a similar note, a respondent wanted the refuge to continue the White Grass ski touring permit agreement.

One respondent asked, "Talking about…it says under Alternative B, consider converting the special use permit for commercial cross country skiing and snowshoeing to a concession. What does that mean?"

Response: White Grass Ski Touring Center (White Grass) operates about 10 miles of its commercial cross-country skiing and snowshoeing operation on the southern end of the refuge. Prior to the CCP, this use has occurred pursuant to an annual special use permit issued by the refuge to White Grass under specific conditions. In the final CCP, we state that we will use a different and more updated process for permitting White Grass to operate some of its cross-country skiing and snowshoeing trails on refuge lands. Within five years of CCP approval, we will convert this special use permit to a concession contract, pursuant to Director's Order 139 and 50 C.F.R. 25.61. This Director's Order states that project leaders may use concession contracts to provide wildlife-dependent and other activities detailed in the National Wildlife Refuge System Improvement Act of 1997. This new process will require the refuge to prepare a prospectus and notify the public of available opportunities to operate a commercial concession on Federal land. Existing and previous concessionaires and any other interested parties will receive a copy of the public notice, making this a competitive process. We will conduct additional NEPA analysis if required.

5.7 Safety and Law Enforcement

(Letter ID#: 6, 52, 132, 172, 175)

Comment: A commenter was concerned with all the hunters and fishermen who access the refuge via private property. Several people were concerned with safety and enforcement if the refuge placed a hiking trail near private property.

Response: Hunters and anglers are only permitted to access the refuge via private property with the landowner's permission. It is not within the refuge's jurisdiction to control which private property owners permit access to hunters and anglers.

Concerns about safety and enforcement will be addressed when we conduct additional NEPA analysis on newly proposed trails.

Comment: Several other people wanted the refuge to hire a full time law enforcement person.

Response: The refuge currently has a full-time law enforcement officer.

Comment: One person had a specific comment concerning unexploded ordnance on refuge grounds: "Page 2-5, Physical Environment, Unexploded Ordnance: This sections states that the presence of unexploded ordnances was thought limited to the area east of the Refuge in the Dolly Sods Wilderness area until a live artillery round was found on the refuge in the spring of 2007. Canaan Valley Institute property is adjacent to and lies to the north and west of refuge property. Five unexploded ordnances have been found there, beginning as early as 2005. At that time, the refuge should have realized that the refuge property was likely to hold unexploded ordnances."

Response: The refuge is aware of the confirmed cases of unexploded ordnance on lands adjacent to the refuge. Therefore, we have modified the wording of this section, located in Chapter 3 of the final CCP, to read, "The presence of unexploded ordnance - left over from military training activities during World War II - on refuge property was thought possible due to the confirmed presence of ordnance in both the Dolly Sods Wilderness area to the east of the refuge and the Canaan Valley Institute property to the west of the refuge. This possibility was confirmed when a live 105mm artillery round was found by a hunter on refuge property during the spring of 2007."

5.8 Infrastructure

(Letter ID#: 13, 54, 57, 60, 91, 146, 156, 157, 163, 165, 175, 176, 189, 195, 202, 207)

Comment: About 27 people commented on infrastructure on the refuge. One person wanted to know what would happen to buildings utilized by White Grass if that business changed ownership.

Response: White Grass ski center operates out of a private building located on private property. The refuge has no control over what happens to this building regardless of who owns the business.

Comment: Several people felt a visitor center was a great idea, but one commenter wanted documentation concerning the need for a 100 person meeting room.

Response: The meeting room would be use for internal meetings as well as for public events. Records show that many of the refuge's public events attract up to 100 people. Therefore, we proposed to build a room that would accommodate up to 100 people.

Comment: Most of the comments wanted the rebuilding of the swinging bridge.

Response: The refuge is currently working on the contracting and environmental compliance for this bridge and construction will start as soon as possible.

Comment: One person wanted clarification concerning building an ADA-compliant fishing platform on Camp 70 stating one already exists. A different person was in favor of an additional ADA fishing platform on the Camp 70 road. In opposition, another person stated, "I am not in favor of another ADA-compliant fishing pier along Camp 70 Road unless and until the one that CVI has already established is documented to be not meeting the demand." Similarly, a respondent wanted the refuge to place an ADA fishing platform at a location where there was year round water: "What would be the point for the refuge to cooperate with Canaan Valley Institute (CVI) to build an ADA fishing pier in the Camp 70 area of the Delta 13 Road? Very few people go past the CVI property line to fish because the WVDNR does not stock trout past this point, and they won't because it's too far to carry the fish. CVI has an ADA fishing pier on

its property along the Camp 70 Road (Delta 13), the first one in the county, built in 2005. This plan should address the relocation of the ADA fishing pier, constructed last year on refuge property on the Blackwater River on the Timberline Road, to an area that has water enough to fish year round."

Response: As mentioned earlier, under our second response in the above section entitled, "1.2, Document (Clarity, Technical, Editorial, Availability)", we have decided to remove the strategy from the draft CCP/EA, Alternative B, that reads, "Work with Canaan Valley Institute (CVI) to construct an ADA-compliant fishing platform on Camp 70 Road, on the Service's property or on CVI's property." Since the refuge now has an ADA-compliant fishing platform on Timberline Road, and CVI has an ADA-compliant fishing platform on Camp 70 Road, we have decided not to proceed with a third ADA-compliant fishing platform on the refuge at this time. Regarding the fishing pier on Timberline Road, there are currently no plans to relocate this structure to a location where there is enough water year-round to fish.

Comment: There was a comment to build a pedestrian bridge on Blackwater River stating, "Build the bridge to replace the Swinging Bridge providing access to trails, both Refuge and CVI, on the south side of the Blackwater River." The same person asked if there was already a trailer pad on the refuge.

Response: Current plans for a new pedestrian bridge across the Blackwater River will provide access to both refuge and CVI trails.

There currently is a trailer pad on the refuge.

Comment: One person wanted to see all power lines buried and the refuge go to solar power.

Response: Within the last two years, the refuge has purchased two small solar panels for use in construction projects. The refuge fully believes in the importance of greening our infrastructure and will continue to pursue those opportunities on a larger scale in the future.

Comment: Finally, a commenter wanted to see an environmental education pavilion on Beall Tract and not on Freeland Tract.

Response: The final CCP states, in goal 4, objective 4.4, that we will construct an environmental education pavilion on the Beall Tract.

5.9 Education and Recreational Opportunities

(Letter ID#: 2, 57, 59, 60, 63, 85, 95, 97, 140, 162, 165, 168, 175, 181, 187, 189, 195, 205, 207, 208)

Comment: About 25 comments fell in this category. Most people were in favor of increased educational opportunities and encouraged the refuge to expand its efforts to educate the general public and local school children. Some suggested kiosks, visitor center, interpretive signage, and special events. Other specific suggestions included more education on cultural history, an education pavilion on Freeland Tract, teaching the scientific method, refuge tours led by refuge staff and open house meetings.

Response: We appreciate the support for increasing environmental educational opportunities on refuges. For a full explanation of how the refuge plans to increase these opportunities over the next 15 years, see objective 4.4 in the final CCP.

Comment: One person said that education could be best handled through increased partnerships instead of increased refuge staff and funding.

Response: We believe that quality environmental education programs can be delivered by the refuge *and* by our partners, and that the two are not mutually exclusive of each other.

Comment: A respondent asked the refuge to inform the public of invasive species and utilize a spruce restoration site for education and outreach. Another person asked the refuge to educate the public on the value of predators.

Response: We agree it is important to educate the public on the dangers associated with invasive species and on the important role that predators play in our fragile ecosystems. We will consider the idea of utilizing a spruce restoration site for education and outreach, but we do not plan to include that action item in the final CCP at this time.

Comment: One respondent questioned the value of a traveling educational program and felt the money would be better spent on the refuge itself.

Response: Comment noted.

6.0 Biological Resources

6.1 Vegetation and Habitat Resources

(Letter ID #: 162, 163, 172, 174, 175, 178, 195, 197, 2, 208, 95)

Comment: Two respondents suggested the refuge use minimum management techniques and use the minimum tool rule.

Response: The refuge appreciates the suggestion for the use of "minimum tool" techniques for management actions. When making decisions on habitat management, methods are evaluated for their efficiency and effectiveness. The refuge system is not held to the "minimum tool" standard like USFS Wilderness policy. However, decisions are made to reduce the impact of habitat management when possible.

Comment: Use of controlled burning was applauded by one respondent.

Response: Comment noted.

Comment: Most of the respondents in this category wanted the refuge to provide secure protection of the natural resources.

Response: Comment noted.

Comment: One person stated there is no scientific research to indicate that bicycles cause environmental degradation.

Response: The refuge acknowledges the research on this subject and has approved bicycling riding on designated roads and trails. Impacts to soils and vegetation are just one component of evaluating uses which are proposed on National Wildlife Refuges. Other issues used to evaluate which uses are compatible include disturbance effects, transportation of invasive species and safety. We review all impacts of bicycle uses in appendix B of the final CCP (Finding of Appropriateness and Compatibility Determination – Bicycling to Facilitate Priority Public Uses). We evaluated impacts of public use more generally in Chapter 4 (Effects of Public Use and Access) of the draft CCP/EA. The final CCP designates 25.5 miles of trail open to bicycle use. This is an increase from current management.

Comment: A person suggested that planting of native trees should rely on grant funding, partnerships and volunteer support.

Response: The refuge has developed very productive relationships with diverse partners through the Central Appalachian Spruce Restoration Initiative which has allowed for sufficient funds to conduct spruce and fir planting activities. However, the refuge will supplement funds as necessary and when available to conduct this management action.

Comment: Concerning past fires, another person stated, "Surely Zurbuch mentioned logging. The significance of those fires is that they burned every bit of organic soil that was not wet."

Response: Comment noted.

Comment: Several people wanted the refuge to ensure that it works with private landowners and other partners in implementing their vegetation management plans.

Response: The refuge has and will continue to work with willing landowners and partners to help implement habitat management actions.

Comment: It was suggested that the Canaan Valley was originally heavily forested and the refuge should manage its lands for natural succession. Along similar reasoning, a respondent stated, "Sum-27: Alt A, "Continue to allow the dynamic nature of beaver pond formation and evolution where bottomland forested and rare plant communities are not threatened." Should delete "bottomland forested and". Flooded timber (dead, alive, or both) provides valuable ecological communities and diversity."

Response: In the preferred alternative of the draft CCP/EA the refuge identifies many areas where natural succession will be allowed to occur. Examples include wetland habitat in Objectives 1.1, 1.2 and 1.5 and upland habitat in Objective 3.3. The refuge acknowledges the value in flooded forested habitat; however prolonged inundation can threaten the acreage and persistence of rare forest communities such as wetland balsam fir and red spruce. These communities are rare in the State and have declined in Canaan Valley partly due to beaver flooding. The refuge is committed to protecting rare plant communities in balance with permitting natural beaver activities to occur. See Objective 1.2 in the final CCP for more information on this management direction.

Comment: Finally, concerning vegetation management, a commenter wrote, "Though this general objective is worthy, the CCP should strive for specific goals (i.e. 10 percent of Refuge in 0-15 year age class, 10 percent 16-30 year age class, etc.)."

Response: Specific details of age class diversity and species composition as well as specific methods and locations with the forest where this management will occur will be written into the refuge's Habitat Management Plan. This is a step down plan to the final CCP. Please see further explanation in the Final CCP in Chapter 1, Refuge Operational Plans ("Step-Down Plans).

6.2 Freshwater Wetland Habitat

(Letter ID #: 101, 13, 143, 168, 175, 178, 195, 197, 209, 54, 98)

Comment: A commenter complimented the refuge wetland goals writing, "The proposed strategies to restore the hydrologic connectivity of wetlands are excellent, as are the strategies to restore cold water fisheries and the red spruce ecosystem through tree planting, especially where the red spruce seed source is no longer available. ….. Single tree fall also adds structural complexity, increasing the habitat niches important: In order to develop site-specific restoration plans and ecological integrity metrics, wetland habitat mapping for the Refuge should first be completed. The National Vegetation Classification units were finalized for all of the vegetation types on the Refuge in 2009. Mapping to this FGDC standard is an achievable and worthwhile goal. Based on my experience with vegetation mapping, this could probably be accomplished in a concerted six-month effort with trained personnel and the GIS resources of the refuge. Stand quality and restoration needs should be an integral part of vegetation mapping. …… Species of concern that benefit from forested wetlands include a long list of rare plants in addition to the one species (balsam fir) mentioned here. A few highlights are black ash *(Fraxinus nigra)*, alder-leaf buckthorn *(Rhamnus alnifolia)*, Canada yew *(Taxus canadensis)*, cranberrytree (Viburnum opulus var. americanum), glade spurge *(Euphorbia purpurea)*, Jacob's ladder *(Polemonium vanbruntiae)*, purple avens *(Geum rivale)*, brome-like sedge *(Carex bromoides)*, and dwarf red raspberry (Rubus pubescens var. pubescens)."

Response: The comment on wetland goals and upland forest structure strategies is appreciated. The refuge is interested in developing a new vegetation map utilizing the NVCS and will work towards revision of our existing map as funding permits. The refuge realizes the importance of forested wetlands and has developed an objective specifically for managing and conserving these resources. Please see Objective 1.2 of the final CCP for more information.

Comment: One person wanted the refuge to work with the State and other partners to stock only native freshwater species.

Response: The refuge is interested in working with partners to improve native freshwater species habitat and presence. Please refer to Objective 1.4 of the final CCP for more information on this topic.

Comment: Concerning channelization, a respondent specifically stated, "Regarding Freshwater Wetland Habitat: I do not see how the referenced Map 2.1 in any way indicates or corresponds to "Some of the tracks or pathways have become channelized and act as barriers to surface water flow." Please clarify this and specify which tracks and pathways are being discussed." Another respondent wanted a clear map showing stream channels.

Response: The map used in the CCP for all alternatives is a general overview map and not meant to show detail for channelization impacts or specific stream channels locations. In general, the multitude of old logging roads, ATV trails and railgrades on the refuge often either intercept and divert water flows or impound water preventing continuity in hydrology. Most of these occurrences are on the refuge's Main Tract although not exclusively. Locations of stream channels on the refuge can be obtained from either the refuge office or the West Virginia Division of Natural Resources. This information can also be viewed through internet mapping programs such as Google Earth.

Comment: Several people responded by desiring the refuge to repair and restore stream banks and several also wanted to see stream banks reforested.

Response: These actions are discussed as strategies to fulfill Objective 1.4 in the final CCP.

Comment: Another respondent was specifically concerned with water chemistry and wrote, "Timberline withdrawals will only take place in winter and summer. Lower flows will not be affected. Blackwater chemistry is moderately rich and then buffered from acid. The tributaries above Greenbriar Limestone Springs and the limestone derived valley floor. You need a geology map. It explains water chemistry and that explains fish population composition and productivity. Pottsville watersheds have no fish (too pure, nutrient poor) to support trout. An example is Yellow Creek and Devils Run."

Response: The refuge will work with State, Federal and non-profit partners to evaluate water chemistry and its implications on supporting brook trout populations if we attempt any population restoration actions.

Comment: One person challenged the refuge's appraisal of the wetland history of the Canaan Valley. Their comment can be summarized with a quoted portion from their letter: "Anyone living here long enough can attest to the fact that all of these areas were once easily passable and often completely dry mid-summer. Only in the last 10-15 years, have beaver settled into these areas and covered sections of these grades with ponds.

Response: We agree that beaver have a dynamic influence on the nature and distribution of pond habitat on refuge lands. Beaver are a natural part of the wetland ecosystem in West Virginia and Canaan Valley and have both positive and negative influences on plant communities and other habitats. The refuge will continue to support the dynamic nature of beaver populations over time as described in Objective 1.1, 1.2 and 1.4 in the final CCP. The purposes of the refuge include the protection of wetland resources as well as to ensure the biological integrity of these systems. Allowing areas to revert to wetland habitat from previously altered conditions is one way to help achieve a more natural wetland system on refuge lands.

Comment: While I support the preservation of the Canaan Valley wetlands, appreciate their significance as an unparalleled natural resources in the country, and understand their role in wildlife preservation, I feel that it is disingenuous to claim that these wetlands are more natural than the railroad grades and beaver that set the stage for their development.

Response: The refuge was established in part to protect the wetlands which exist in Canaan Valley. As such the entire suite of wetland habitat types are important for the refuge to protect. Railgrade

development is not a natural process and has created obvious changes in the extent, location and functioning of wetlands on the refuge. As directed by the Services Biological Integrity Policy (601 FW 3), the refuge manages habitats when possible to improve the biological integrity, diversity and environmental health of the system. As interpreted in the policy this includes restoring ecosystem function using historic conditions as a baseline (601 FW3 3.10(A)(3). Therefore artificial structures such as railgrades are evaluated for their effect on the biological integrity, diversity and environmental health on refuge habitats and wildlife. When possible, practical and biologically beneficial these structures will be removed or modified to meet policy goals as described above.

Beaver are a native mammal and the refuge supports their continued dynamic wetland influence with some limitations as described under Objective 1.2 of the final CCP. Namely, when beaver flooding threatens rare forested wetlands, other rare plant communities or significant refuge, State or private infrastructure they will be trapped to prevent or reduce impacts.

Comment: It is a mockery to those who have studied the area formally and informally to include such statements in this comprehensive plan. These statements essentially rewrite the history of these wetlands in order to justify actions that involve spending tons of money, resources, and labor hours to prohibit access and obliterate the most feasible, economic, sustainable, low-impact solution to increasing public use and trail connectivity.

Response: The refuge's first priority is to protect and manage the wetland and upland habitats and their associated wildlife as consistent with the purposes of the refuge and the mission of the Refuge System. The policies which help guide refuge resource management are described in Chapter 1 of the final CCP. The refuge permits recreational uses only after those uses have passed appropriateness and compatibility findings. A listing of appropriateness and compatibility findings for all uses permitted on the refuge are found in appendix B of the final CCP. Locations of public use trails are developed systematically to meet the goals of the public use program, provide adequate access to a variety of refuge habitats and minimize disturbance and other associated impacts. Please refer to Objective 4.3 of the final CCP for more information.

Comment: The irony of stating that remediation of such grades and trails that "have altered the natural hydrologic processes" will allow "natural processes to be restored and soil erosion reduced" is off the charts ridiculous! My problem is not with the Refuge managing the Valley's resources to encourage healthy, viable wetlands and wildlife habitats. My problem is with the mythic account of local history used in the service of some objectives over others. Public access and more varied uses of the Refuge on many of these grades is being denied under the false premise that these grades and public use of them compromises the integrity of the Valley's "natural hydrological process," (read: beaver ponds on old railroad grades). Until the Refuge shut off access to the crossing at the bottom of A-Frame (and many grades and trails), beaver built wetlands elsewhere and I was able to cross without damage to the stream or wildlife habitat."

Response: The refuge's primary responsibility is to ensure resources the refuge was established to protect are not impacted through previous or future influences which would affect the biological integrity, diversity or health of those wetland systems. Some historic railgrades are currently being used as public use trails however others show obvious changes in plant communities likely related to altered hydrologic flows. Trail evaluations are based on a number of factors which are described in the compatibility determinations for public use in appendix B. A discussion of why the refuge did not consider one railgrade as potential access for public use (Jack-Neal's Ford) is found at the end of Chapter 2 under "Issues Considered but not Further Analyzed" in the final CCP. Ultimately, the proper placement of trails to provide for secondary uses of the refuge system (wildlife observation, education, interpretation, photography, hunting and fishing) must be viewed first and foremost through the lens of wildlife and habitat protection and restoration.

Comment: Several people expressed their desire to see the refuge protect wetlands.

Response: Thank you for your comment.

6.3 Red Spruce, Balsam Fir Restoration

(Letter ID #: 13, 60, 101, 141, 142, 143, 162, 178, 202, 205, 208)

Comment: Most of the 11 comments were in favor of spruce/fir restoration. A representative quote states, "There are plenty of reasons to restore spruce forests on the Refuge and just as importantly, there are plenty of reasons to have the Refuge staff working to do so. By any account the Refuge lands were once primarily red spruce forests. Restoring them should be a principal goal for much of these lands, as included in Alternative 2.

Response: Thank you for your comment. Please refer to Objectives 1.2, 2.4 and 2.5 in the final CCP for strategies related to restoring red spruce forests. These objectives identify the need to increase the spruce component of the refuge in both upland and wetland habitats.

Comment: It has been the leadership demonstrated by the Refuge staff that has led to the creation of CASRI. The refuge's lands are a critical component of the historical high elevation red spruce forests CASRI is working to restore. The staff's expertise and experience in these restoration efforts have been key to the establishment of this regional effort that is focusing on a landscape scale restoration effort. CASRI is the most exciting, innovative and collaborative conservation effort going on in West Virginia today. Canaan Valley National Wildlife Refuge should continue and expand on its work to restore the red spruce ecosystem on the refuge and continue to provide leadership in its restoration across the mid-Appalachian Highlands."

Response: The refuge will continue working with CASRI as described in the final CCP and specifically to address Objectives 1.2, 2.4 and 2.5 to increase the quality and quantity of red spruce forest on the refuge.

Comment: However, several people expressed their negative opinion about spruce/fir restoration that can be summarized in the following quote: "I wonder if red spruce regeneration should even be considered on the refuge. From my over 25 years of being in the woods and wetlands of Canaan Valley I have found that the areas where red spruce were, and want to be in the future, have a high number of seedlings naturally occurring at this time. If this program continues, it should be done completely by volunteers, at the volunteer's expense. CVNWR should commit nothing but permission to use a location for the planting. I believe this red spruce planting program is just another band wagon that the refuge biologists have jumped on by personal preference and the cajoling of like-minded people in the WVDNR, TNC and WVU. Mother Nature knows where red spruce should be in the valley and she'll put them there."

Response: The refuge's red spruce restoration program is aimed at accelerating the growth and distribution of this conifer species. While it is true that some areas are re-seeding naturally, most locations where spruce occurred historically are devoid of seed sources necessary to create desired habitat conditions. Through careful planning and consultation with partners, locations of plantings are based on site suitability, wildlife habitat needs and other factors. To date this work has been accomplished almost entirely through the support of volunteers. However, because this habitat type is rare in the State, important for a host of wildlife species in need of conservation and is a historical community type, the refuge will also uses station funds, when necessary and available, to further this restoration effort. As always, the refuge will use adaptive management and the best available information to make decisions on locations of future planting efforts.

6.4 Upland Habitat

No comments were placed in this category. There were comments that mentioned upland habitat, but their comments were really about early successional forests.

6.5 Forest Fragmentation

(Letter ID#: 2, 53, 54, 139, 141, 162, 163, 176, 180, 208)

Comment: Opinions were nearly evenly divided concerning forest fragmentation. Four people questioned the validity that logging roads created fragmentation and retorted that the roads were actually valuable

ecosystem variants; several other people agreed on the need to reduce forest fragmentation; and couple people were not in favor of cutting patches along the toe slopes.

Response: Logging roads create linear canopy and understory gaps in otherwise contiguous forested habitat. As discussed in Objective 2.1 in the final CCP these corridors may affect forest interior bird habitat, amphibian distribution, predator levels and non- native plant presence and abundance. The refuge is also concerned with the effect logging and skid roads have on local hydrology. Because these roads often bisect streams and spring flows, the flows are often diverted away from natural channels through intentional ditching or subsequent erosion. Removing and recontouring old logging and skid roads will help restore the original hydrology of the refuges forested landscape and improve the biological integrity, diversity and environmental health of refuge land (see 601 FW3 for more information on this policy).

In regards to forest cutting along the toe slopes, these areas will not serve as fragmentation of existing forested habitat as they are entirely on the edges of forest blocks and are mostly buffered by shrub communities. The refuge is managing for large forest block size to protect and improve habitat for forest interior birds as described in Objective 2.1. Forest edge cutting will reduce the overall amount of mature forest on the refuge but not significantly affect the habitat values for forest interior species or create forest habitat fragmentation.

6.6 Early Successional Forests

(Letter ID#: 2, 13, 21, 34, 38, 53, 54, 63, 82, 95, 101, 102, 139, 141, 143, 163, 175, 178, 205)

Comment: About 25 people responded to this category. Most of those respondents were in favor of establishing early successional forests. Some were concerned that too few acres were devoted to this management objective summarized in the following quote: "While we applaud the cutting strategies identified in Objective 3.2, the target acreage of 10-15 acres cut annually is woefully inadequate. If early successional management is to receive the emphasis and priority that is envisioned, larger portions of the 1,130 acres available must be treated. Given that the best early successional stage habitat occurs from years 2 through 15 (provided the deer don't delay regeneration), 75.3 acres of this habitat should be cut per year in blocks 5-20 acres in size. Well designed and supervised commercial logging could pay for this management action. Objective 3.3 for alternative B has generated similar concern. While we believe that the acreages proposed for management are significant, the treatment acreage and emphasis is not. The first strategy within this object is to develop and implement a shrub and old field habitat management plan. Our concern is that drier alder sites are to be located in years 5-10, much later than plan generation (within 3 years of CCP approval). In order for these sites to receive the emphasis and priority they deserve, they must be located during plan preparation. Given that these will be upland, mineral soil sites, they should respond similarly to their northern counterparts and "experimental" cuts will likely be unnecessary as its effectiveness has been proven. Within this objective, only 5-10 acres per year of active management is proposed for spirea and St. Johnswort communities while at least 100 acres of grassland will be mowed or similarly treated. Given that there are 3,551 acres within the Shrubland and Old Field objective and likely at least 300 acres of spirea and St. Johnswort available, we request that at least 100 acres of this shrubland type be treated annually if the early successional stage emphasis is to be achieved with any measurable success."

Response: The refuge will remove the annual target acres cut to prevent upper limitations of successional management as described in Objective 3.2 of the final CCP. Limitations presented reflected considerations for available personnel to conduct activities during the appropriate seasons as well as seasonal access restrictions. However, given previous conversations with WVDNR and other partners, we believe that opportunities exist to help achieve management of this habitat over the life of the CCP. As such the refuge will not state maximum annual acres which would limit cuts in the CCP to take advantage of partners support when necessary and available. Commercial logging was considered but not included in part due to the concern of providing deer easier access to regenerating seedlings if logs were removed from the site. We believe the success of successional forest management relies partly on effective deer management to permit the diversity of tree species to regenerate successfully. The size and method of forest edge cuts will be evaluated for successful forest regeneration over time as stated in the CCP. If one method used does not promote successful regeneration the refuge will look for other alternatives to achieve habitat Objectives. The breadth of early successional habitat on the refuge, upland and wetland shrub communities, old field succession, hawthorn savannah and grasslands are also priorities for management

to promote habitat for species of concern. Young dense hardwood forest is a component that is lacking in the valley which is a reason it is detailed in Objective 3.2. Nonetheless it is one component of a larger view of successional habitats which support migratory species of concern on the refuge.

In regards to the acres identified in the shrubland management strategy, we have modified that strategy in the final CCP to state that the refuge will treat that habitat in mosaics of 5-10 acre blocks to make it clear that we are not limiting management to 10 acres or less in any given year. In regards to grasslands being promoted to shrub successional habitat, our intent will be to manage these areas as successional/shrub communities for our priority early successional focal species.

Comment: One person wanted to see mention of active management of riparian areas with early successional habitat.

Response: The refuge evaluates locations of successional management based upon targeted species habitat needs but also through the lens of wetland protection. Riparian area management is discussed in Objective 1.4 in the final CCP and is focused on protecting and enhancing the biological integrity of these wetland systems as directed by Service policy (601 FW3) and founded on one of the purposes of the refuge, to protect wetlands. Increasing cover rather than reducing it along stream and river corridors will help reduce sedimentation, improve water quality and increase habitat values for migratory birds.

6.61 Aspen Management

(Letter ID#: 2, 53, 54, 63, 95, 97, 101, 102, 139, 163, 175, 205)

Comment: Fourteen comments specifically mentioned aspen management. These were all in favor of aspen management and many of the comments thought the stated acreage was too small. One person wanted to assure that aspen cutting was done without leaving slash visible from roadways.

Response: The refuge agrees that the objective for aspen management as stated in the draft CCP/EA was not accurate. In the final CCP, we have changed the language of Objective 3.1 to reflect that 75 percent of the 114 acres will be managed in the 0-15 year age class. We removed language in the strategies identifying the annual target for cutting and replaced this with a statement that identifies the aging nature of the 114 acres of aspen communities requiring accelerated management if these communities are to be maintained as aspen habitat. We included language in Objective 3.1 that identifies the need for the management and conservation of aspen communities not identified in the CCP due to limitations of existing vegetative mapping coverage. When possible the refuge will attempt to prevent aspen slash from being too obvious from local roads. Much of the aspen management will occur away from public roads and homes, however, some areas will be visible from refuge trails.

6.62 Grassland Management

(Letter ID #: 53, 88, 95, 139, 163, 205)

Comment: One person questioned the difference in acreages of proposed grassland management between Alternatives A and B in the draft CCP/EA. Another questioned the acreages between Alternatives B and C stating, "Alternative B identified 3,551 acres (2,482 acres old field, 216 acres grassland and 853 acres shrub) as available for management, whereas alternative C identified 3,525 acres (2,482 acres old field, 190 acres grassland and 853 acres shrub); we question what happened to the 26 acres of grassland?"

Response: The difference in grassland management between Alternative B and Alternative C (Objective 3.3) is that in Alternative C, a 26-acre grassland unit would continue to be managed for grassland species. The 216 acres of grassland identified in Objective 3.3 are acres which are currently managed for grassland species but which were proposed to be managed for early successional shrub species in Alternative B.

Comment: There was a specific suggestion to mow grasslands annually in a serentive design.

Response: The refuge manages habitat to best meet the needs of wildlife species. Grassland rotations of 2-4 years are currently used to maintain nesting habitat for migratory birds. Leaving some fields uncut is important for fledging and migration habitat of priority grassland obligate migratory bird species.

Comment: A respondent asked that mowing be done on a two-year cycle instead of a five-year cycle.

Response: See above response. The refuge uses adaptive management to decide when particular grassland units are cut. Rotations can be shorter or longer depending upon vegetative conditions and the field's use by targeted grassland obligate bird species.

6.63 Alder Management

(Letter ID#: 53, 95)

Comment: Three respondents applauded refuge efforts to plant and manage alder.

Response: Thank you for your comment.

6.64 Shrubland

(Letter ID #: 54, 63, 139, 178)

Comment: Five people were in favor of shrubland management and most wanted the acreage to be sustained or increased. One person suggested using short-term grazing by cattle to manage shrublands.

Response: Of the 3,551 acres listed in Objective 3.3 of the final CCP, 2,698 acres are currently old field or managed grassland habitat which we intend to promote into shrub and early succession forest. Most of these acres are not in need of mowing treatment, but rather in need of encouraging shrub growth through planting, disking or other management techniques. Once shrub and young tree growth establishes in these areas, they will be managed to sustain early successional habitat. Current refuge management has been mowing approximately 25-30 acres of shrubland habitat on a two to four year rotation. Priorities are in areas where hawthorn has been under grown by dense shrub habitat or locations where singing grounds for woodcock are being maintained. The refuge included potential use of grazing animals for management of successional habitats. See strategies listed under Objective 3.1.

6.7 Old Growth Forest

(Letter ID #: 102, 162, 208)

Comment: Three comments were directed toward old growth. Two of these wanted to see the refuge continue its efforts to reestablish or enhance old growth. One commenter felt the refuge is surrounded by mature forests and should focus on early successional forests.

Response: The refuge's plans for forest development are discussed in Objectives 2.3 and 2.4 of the final CCP and aim to move forested habitat on refuge towards mature forest conditions in both hardwood and mixed hardwood-conifer forests. Although it is true the refuge is surrounded by forests, most are not considered, nor have the characteristics of, a mature forest community. Additionally much of these adjacent forested lands do not have management strategies to ensure mature forest characteristics are attained over time. The refuge's forest lands can play a role in managing habitat for these conditions

which may be unique to management of forested lands in the surrounding larger landscape. Additionally, managing for mature forest conditions brings the refuges habitat closer to historic natural conditions as directed by service policy (601 FW3).

6.8 Rare Habitat Types

(Letter ID #: 52, 63, 208)

Comment: Three comments favored protecting rare habitat types. One of these suggested that only foot traffic be allowed in sensitive habitats.

Response: The refuge is committed to protecting rare plant communities. Locations of public use trails are based in part on their impact to refuge resources, including presence and distribution of rare plant communities.

6.9 Invasive Plant Species

(Letter ID #: 162, 208)

Comment: Two comments encouraged a strong program to detect, prevent and eradicate invasives.

Response: Thank you for your comment. Throughout the biological goals and objectives we highlight the need to monitor and treat invasive plant species on refuge lands. See in particular Chapter 4 in the final CCP, under "Actions Common to All of the Alternatives", where we detail invasive species management.

6.10 Monitoring

(Letter ID #: 13, 60, 175, 195)

Comment: Five people commented about monitoring. One person wanted to see visitor use monitoring and another wanted the refuge to establish clear monitoring protocols.

Response: The refuge currently has a protocol to monitor public use trails on the refuge to ensure they continue to meet compatibility requirements. Monitoring of other aspects of visitor use will be addressed in the visitor services and inventory and monitoring plans. See Chapter 1 in the final CCP for more information on refuge operational plans.

Comment: One person questioned the value of monitoring and felt that 15 years of study was sufficient. One other person felt an extensive inventory list would be much less expensive than continued monitoring and adaptive management.

Response: Monitoring is necessary to ensure that management actions conducted are having the desired effects on habitats and associated wildlife species. The Service is committed to monitoring so that information can be evaluated for success and modified as necessary through adaptive management. As the refuge implements the various measures outlined in the CCP related to habitat manipulation, we will monitor the response as necessary. Without this monitoring the refuge will be unable to determine if the actions taken were effective.

Comment: One person wanted to know about previous wildlife documentation: "is my understanding that all of the data collected for Allegheny Power Systems (primarily by Edwin Michael, PhD) throughout the mid-1980s – 1994 was provided to the CVNWR. This research was conducted on property purchased by the refuge in 2002, the Main Tract. In these studies, the southern water shrew was documented, as were breeding northern harriers. This text and Table A-4 list the southern water shrew as "known or expected, but not yet documented". Please define what must occur for a species to be "documented" on the refuge.

Breeding woodcock surveys were also conducted during this time and would provide additional data to supplement the surveys conducted on the south end of the refuge since 1999. This is a source of historical data that appears overlooked in this section, and I do not see it referenced in the bibliography section. Where is this data and how has it been used?"

Response: The refuge has received the reports from the wildlife surveys referenced and reviewed these documents for mention of southern water shrews. The southern watershrew is technically another name for the subspecies of northern watershrew (*Sorex plaustris punctulatus*) which occurs in West Virginia and the southern Appalachians. From the reports, only one year (1980) had the northern watershew listed as being found in the study area, as shown in a summary table from later years. Unfortunately the 1980 study report was not received by the refuge and therefore we do not have complete information about the location or numbers of this species found in the valley. We will make changes to Table A-4 as necessary to reflect this information. To be "documented" the species must have a credible observation of presence or of breeding activity. We relied upon the WVDNR natural heritage program to provide documentation information concerning some species on the refuge and it was from this source that the breeding northern harrier citation was derived. Other species documentations have come from refuge staff or other researchers. The reports from Allegheny Power Systems are an important source of historical wildlife and plant communities in Canaan Valley and we hope to rely on these to supply context for changes in wildlife on refuge lands.

7.0 Wildlife

(Letter ID#: 83, 95, 174, 177, 195)

Comment: One person questioned the impact of bicycling on wildlife and stated that to date only four studies have compared the impacts of the sport on wildlife to other users.

Response: The refuge reviewed impacts of bicycle use on refuge resources in Chapter 4 of the draft CCP/EA and in the compatibility determination for bicycle use in appendix B of the draft and final documents. We evaluate impacts on a variety of issues not just to wildlife or how bicycle use compares to other methods used to facilitate wildlife oriented public use activities. Bicycle access does not fall under the designated "Priority Public Uses" of the refuge system and is only permitted on refuge lands when it is deemed necessary to facilitate those Priority Public Uses. For more information about wildlife dependent recreation on National Wildlife Refuges, see Chapter 1 of the final CCP. Impacts of bicycles and other non-priority public uses must be thoroughly evaluated to ensure that such use is appropriate and does not affect the purposes of the refuge or the mission of the Refuge System. The refuge is permitting bicycles on designated trails and has proposed to increase access for bicycles through new trail creation.

Comment: One person agreed that the Indiana Bat and flying squirrel should receive proper management attention.

Response: Thank you for your comment. Please see Objectives 1.2, 1.3, 2.3, 2.4 and 2.5 in the final CCP for strategies dealing with the conservation and management of these species on refuge land.

Comment: One person commented on earthworm health.

Response: Thank you for your comment.

Comment: One person mentioned stocking grouse and another questioned why there was no mention of common (Wilson's) snipe in the CCP.

Response: The USFWS typically addresses species population management through habitat enhancement rather than stocking. Only in extreme situations, typically when species are endangered, do refuges actively stock wildlife on refuges. Common or Wilson's snipe are a species of concern in West Virginia and are discussed in Chapter 3 of the final CCP (Chapter 2 of the draft CCP/EA) as well as listed in appendix A. The protection and management of wetlands as detailed in Objectives 1.1, 1.3 and 1.4 in the final CCP address the habitat needs of Wilson's snipe.

7.1 American Woodcock

(Letter ID #: 1, 2, 52, 60, 63, 95, 101, 113, 175)

Comment: Thirteen people commented on the American woodcock. Most were in favor of maintaining or increasing woodcock habitat management.

Response: Thank you for your comment. The refuge will continue to manage habitat for woodcock and , as described in strategies under Objectives 1.3, 3.1 and 3.2 in the final CCP.

Comment: Two people wanted the refuge to maintain singing and breeding ground. One of those asked if singing ground surveys had already occurred.

Response: The refuge is committed to managing for all stages of the American woodcock's lifecycle, although migration habitat may be more important for this species in West Virginia and Canaan Valley.

Singing ground surveys are conducted by refuge staff and will continue to be conducted to evaluate success in managing habitat for this species.

Comment: One person asked why so little has been done historically to manage for woodcock.

Response: The refuge has managed aspen, old fields and shrub communities for woodcock since its inception. Large scale cutting projects such as those described under Objective 3.2 in the final CCP were not conducted earlier due to the fact that staff was required to evaluate impacts of significant changes in management and vegetation communities in a NEPA document. The draft CCP/EA provides the NEPA compliance necessary to move forward with larger successional management actions.

Comment: It was specifically suggested that, "I believe that area north of Cortland Road had not seen any plant succession work until that done in the last 5 years in cooperation with RGS and the refuge. More of this type of work should be initiated and new and proven methods such as controlled burning and mechanical cutting -tilling of areas with to control exotic and undesirable species. In the valley proper the continued regeneration of fir, and spruce is important as an escape cover for birds and to keep the northern landscape look. Another very serious problem is the spread of grasses in areas where it once was shaded out. Grass is no friend of woodcock and innovative way to reduce expansion of it in the alder and aspen should be studied to determine best ways to open up areas and expose the soil so birds such as woodcock can get to the worms they feed on. The cattle may be why the birds used the areas more than they do today. The new plan for Canaan Valley should take into consideration what the valley was like when it supported larger numbers of birds, and study the available data up through and including present information to help formulate a new plan."

Response: Thank you for your comment and suggestions. The refuge is committed to managing habitat for a variety of early successional bird species including American woodcock. We also describe developing woodcock management demonstration areas in collaboration with the Wildlife Management Institute, WVDNR and others to evaluate best management practices for woodcock habitat at the refuge. Techniques such as prescribed fire, controlled grazing and mechanical cutting of vegetation are all described in the CCP as methods to achieve desired habitat conditions.

Comment: A respondent asked the refuge to obtain and study the American Woodcock Conservation Plan.

Response: The refuge consulted the American Woodcock Conservation Plan in the development of the draft CCP/EA. Please refer to Chapter 1 in the draft or final document, where we list it as a document used to help develop biological goals and objectives. It is listed in the bibliography indicating its use in the development of the CCP.

7.2 Migratory Birds

No comments were placed in this category. There were several comments that mentioned migratory birds but their comments were actually about early successional forests.

7.3 Deer

(Letter ID#: 34, 60, 63, 115, 168, 169, 175, 177, 178, 209)

Comment: Eight respondents had general comments about deer and each asked the refuge to thin or reduce the deer population.

Response: The refuge is concerned with impacts of deer browse on refuge habitats and wildlife that rely on those habitats. We outline our concerns of deer browse impacts in several biological objectives and list methods which are proposed to increase deer harvest under Objective 4.1. We are committed to working with the State to find ways to manage the deer population to ensure the ecological integrity of refuge lands.

7.4 Invasive Wildlife Species

There were no comments in this category.

7.5 Threatened and Endangered Species

(Letter ID # 13, 78, 146, 151, 162)

Comment: One person wrote, "Removing rare species tracked by NatureServe and the WV Natural Heritage Program (rail, Wilson's snipe, American coot, moorhen, and Appalachian cottontail) from the hunt list is highly consistent with the Refuge's mission and should be done under all Alternatives. If rare species cannot find refuge in a National Wildlife Refuge, where can they hope to recover? I would like to see these species recover to the point where they can be hunted without threat to their long-term viability."

Response: The refuge proposed removing rare species from refuge hunt lists in Alternative D of the draft CCP/EA. This action was not chosen for the Service-preferred alternative in the draft, or for the final plan, as it is highly unlikely that refuge specific hunter harvest of these species would jeopardize their continued existence on the refuge or in West Virginia. The birds listed are migratory game birds managed by the U.S Fish and Wildlife Service on a flyway basis, with State regulations established within the framework of the Service's directives. The harvest of these species is likely coincidental with waterfowl hunting and the numbers harvested on the Refuge would not be significant to the overall flyway populations of these species. These decisions on season length and bag limits are made on a flyway basis, and the State's regulations would reflect any adjustments made by the Service on a national scope.

Habitat conditions, rather than hunting, are likely the predominant factors influencing many of the rare species in WV and in Canaan Valley. For example, Refuge hunt information shows an average of one snipe per year harvested during the years 2002 to 2005. Snipe harvested in West Virginia are likely incidental take by sportsmen engaged in hunting other species; therefore, hunting is expected to have little impact on the local, State or flyway snipe population. No hunter information forms collected since 2002 have reported the harvest of American coot or moorhen and there have been no reports of their presence on the refuge during that time.

In regards to Appalachian cottontails, the refuge is interested in identifying this species on refuge lands through hunter harvest. The Service would work with the State if possible to establish protocol and procedure for collecting and identify samples. This would be accomplished by managing the hunt through a refuge Special Use Permit to ensure that harvested animals could be analyzed to determine the species. However, the small amount of hunter interest and apparent low rabbit harvest from Refuge land indicates that despite low populations of Appalachian cottontail and snowshoe hare, it is highly unlikely that the harvest of these species will have any direct significant impact to local or regional populations. If after hunter harvest samples show a predominance of Appalachian cottontails being harvested, the refuge will consult with the WVDNR to discuss changes in hunting seasons for rabbits in order to ensure continued persistence of this rare mammal on refuge lands.

Comment: A commenter questioned the validity of the Cheat Mountain Salamander habitat. He said, "Now I'm not no college educated fellow, but I'm 73 years old and I have been living in that valley and that swamp since I was 10, hunting, fishing, trapping, everything else and I will tell you now, that little salamander up there (inaudible) extinct (inaudible) and they don't live in that swamp, they live in the little creeks around (inaudible) side of the mountains under the rocks, under the logs. I lived here for almost ten years at the Swinging Bridge in a cabin year round and I (inaudible) little critters not living in that swamp but yet they say they are going to protect the habitat and I would like to ask you this. I have seen articles in newspapers in different areas where our goal is to preserve and protect the animal habitat and the wildlife. Now we have been here since we was kids and they built that railroad in the early 1900's and I guarantee you right now today, and anyone (inaudible) in that time can tell you, there is over 120 percent more animals and wildlife in that valley than there ever was. So my question is who and what are they protecting it from?" Also concerning the salamander a commenter wanted to know if their habitat was superimposed on any maps in the document.

Response: Cheat Mountain salamanders do not occur in wetland habitat and it is true that they would not be found in a swamp. It is certainly likely that since the early 1900's wildlife populations have changed over time. Plant communities which were cut and burned following the timber extraction have begun to heal and grow back, altering habitats for wildlife in the valley. The refuge was created in part to protect as well as manage habitats for wildlife as well as to conserve wetlands. Threatened and endangered species are considered "trust wildlife resources" of the U.S. Fish and Wildlife Service and due to their limited distribution and Federal protection under the Endangered Species Act, we generally do not indicate locations of these species on public maps.

Comment: Several people were in favor of habitat protection for threatened and endangered species.

Response: Thank you for your comment. The refuge will protect habitat for threatened and endangered species. See Objectives 1.2, 1.3, 2.3, 2.4 and 2.5 in the final CCP for strategies to manage and protect habitat for endangered Indiana bats and threatened Cheat Mountain salamanders.

Comment: At a public hearing one commenter said, "Our view on endangered species, we are friends of endangered species and our view on that is endangered…the most uncared for and endangered species in the county is the citizens of the county, not all these little critters crawling in the swamps. Now we have protected this valley for all these years of our lives. The deer have browsed through this valley all these years. Everything was fine, everything was pristine or you people wouldn't want it to start with, so don't kick us out in the cold and act like we don't know what we are doing because we took care of that valley that you now have that we paid for and we will continue to help take care of it but we have to work together on it and have to be open. There are issues, other issues, I will discuss throughout the night… or evening, or night, whichever it takes, I don't care. But if it's going…what you just said, I will hold you to that and everybody here heard you because my endorsement was not to infringe on these people's private business throughout all this but also realize you are in the middle of something where you have to stay away from the swamps or the wetlands as you guys like to call them, we call them swamps, to protect all these little things and I don't read the paper much but I just happen to see one article where these created wetlands amazingly enough…these little critters are moving into these wetlands. Well if you build a swamp, something is going to live in it, it will go to it and if it ain't there, it will live where he come from but I will continue to work with you but we are going to have some stuff to iron out. You know that and I know it and you got enough people here, a whole boatload is what we are talking about that if the time comes, I want to be there but since I endorsed this for the town and I explain to the council when I come back, it was…to me it was going to interconnect all the trails through the valley clear around back, which will be good for the economics for the area. That's why we did it and we even authorized as far as we can authorize (inaudible) some of the funding for this because if we put our blessing on it and it looks better (inaudible) going down the road but if it's going to encroach on these people, I'm not for it but if you keep your word on it, and I will be right there to make sure you do or you are going to hear about it, then I'm out of it. But if you do what you say, he will be watching you and we will all be watching you."

Response: Thank you for your comment. The refuge is always willing to work with the community to help protect threatened and endangered species, wetland habitat and other resources the refuge was established to protect.

7.6 Snowshoe Hare

(Letter ID #: 53, 139)

Comment: One respondent asked the refuge to join the WV Division of Wildlife Resources in their hare study program and the refuge should survey refuge hunters. Another respondent felt the hare should receive more attention in the CCP.

Response: Thank you for your comment. Snowshoe hare have been documented on the refuge but little information exists on their distribution or abundance on refuge lands. We will consult with the WVDNR and are very willing to collaborate with any ongoing or new hare studies or research projects.

7.7 Waterfowl

(Letter ID #: 141)

Comment: One respondent was concerned that waterfowl were not mentioned in the executive summary.

Response: We regret that readers did not see any information about waterfowl in the executive summary. Please refer to the final CCP for discussions of waterfowl in Canaan Valley, specifically Chapter 3 (Affected Environment) and Chapter 4, Objective 1.4

7.8 Fisheries

(Letter ID # 60, 195)

Comment: Three commenters talked about fisheries. One mentioned keeping water temperature records. Another mentioned maintaining eastern brook trout habitat. The other simply wanted the DNR to manage the refuge's fishery resource.

Response: The refuge is concerned with maintaining water quality consistent with the needs for brook trout habitat. Brook trout are discussed as a species of concern in the refuge CCP and specifically addressed in Objective 1.4 in the final CCP. Maintaining and improving brook trout habitat are included as strategies to fulfill this objective. The WVDNR does manage fisheries in the State and we look forward to working with them on habitat evaluations, restoration and enhancement projects that support native brook trout.

8.0 Public Access

Public Access was by far the comment category that received the most comments from the public. It was broken into fourteen categories.

8.1 Public Access and Public Use (General comments)

(Letter ID#: 25, 33, 41, 42, 51, 52, 59, 60, 65, 90, 115, 124, 129, 134, 141, 149, 162, 175, 176, 179, 180, 187, 207, 208, 209)

Comment: Thirty-four people had general comments concerning public access. Most of these wanted to see some form of increased public access.

Response: The final CCP expands and enhances opportunities for all the six priority public uses, including wildlife observation, wildlife photography, environmental education and interpretation. These enhancements include more public access points, more trail miles, and more trail connections to create looped trails.

Comment: One person doubted that public use was contradictory to natural preservation.

Response: We agree that not all public uses are contradictory to natural preservation. We believe any public use that is found appropriate (i.e., complies with applicable laws and regulations, is consistent with applicable Executive orders and Department and Service policies, etc.) and compatible (will not materially interfere with or detract from fulfilling refuge purposes and the mission of the Refuge System) is, by definition, not contradictory to natural preservation. We further believe that wildlife-dependent public uses connect people with nature and encourage stewardship of our natural resources. For more information about appropriate and compatible uses, refer to appendix B of the final CCP.

Comment: A person asked about whether the public access process would continue to be evaluated over the next 15 years.

Response: While we are always evaluating the refuge's public use program in an effort to determine how we can best respond to the public's needs, all trails on the refuge have been evaluated. Over the next 15 years, we will focus our efforts on the future trail extensions and connections outlined in the final CCP. Some of these new trails will require additional NEPA analysis and additional public input. We will also be working on a new visitor services plan, which may require public input. The public will be notified of any such actions and will be given ample opportunity to provide input.

Comment: One person asked if fishing access would be limited.

Response: The final CCP states we will allow fishing wherever an approved road or trail meets a river, stream or pond. Following completion of this CCP, we will solicit public input to help us develop a fishing plan that will state more specifically where fishing is allowed on the refuge.

Comment: A respondent wanted to know why bicyclers could access certain areas of the refuge but wheelchairs were prohibited.

Response: Areas of the refuge that are specifically ADA-accessible include Freeland Trail, fishing pier on Timberline Road, the Visitors Center, and reserved hunt blinds. Other areas of the refuge are not suitable or safe for wheelchairs because of grade, substrate, terrain or other factors.

Comment: Access should not be discriminatory according to a person who wrote, "All allowable wildlife dependant recreational activities should get equal access to refuge lands, and have rules and regulations applied evenly. The current and proposed policy is discriminatory. It gives some users preferential treatment with things like access, dogs, nighttime use etc. and restricts others with equally as credible and legitimately appropriate uses from having the same privileges."

Response: We refer the reader to our response to the second comment in this section where we describe the process for finding public uses appropriate and compatible.

Comment: Many people wanted to see more trail connectivity.

Response: The final CCP details our plans for additional trail connectivity on the refuge. See goal 4, objective 4.3 for details. In addition, the refuge will continue to work with adjacent land managers to promote and implement a "Heart of the Highlands" system of connected trails.

Comment: A few people wanted limited four-wheeler access: "At my age and health it is very hard to hunt and drag a deer from the Refuge without good access. I would like to see some limited four wheeler access roads during deer season off Cortland road. If you go to the end of Cortland Road and climb the mountain up to the top you have to be in good shape and this is restrictive to people like myself. I would be willing to pay more if I had better access and the funds could be used for staff and conservation programs."

Response: One of the guiding principles of the hunting program, according to new Fish and Wildlife policy (605 FW 2), is to provide opportunities for quality recreational and educational experiences. As we described in the draft CCP/EA, under alternative A, goal 4, objective 4.1 (page 3-26), we interpret this to mean that refuge hunt programs should promote positive hunting values and hunter ethics such as fair chase and sportsmanship. In general, hunting on refuges should be superior to that available on other public or private land and should provide participants with reasonable harvest opportunities, uncrowded conditions, fewer conflicts between hunters, relatively undisturbed wildlife, and limited interference from or dependence on mechanized aspects of the sport.

We understand that different viewpoints will result in different interpretations of what constitutes a "quality" hunt and we appreciate that it is not possible for some hunters to walk long distances. We addressed this latter issue in the final CCP (and in the draft CCP/EA), under goal 4, objective 4.1, by offering to provide a shuttle service to facilitate deer removal during certain times of open deer season. Although some hunters feel the refuge should provide additional opportunities for motorized access, we feel there are ample opportunities in nearby areas off-refuge for hunting with Off-Road-Vehicles (ORVs), and this is not the type of experience we wish to provide at the refuge . Damage to valley resources by off-road vehicles is well documented in a report by Ben Stout (1993).

Comment: A respondent thought the refuge's estimate of 15 percent visitor increase was too low.

Response: The estimated increase in visitor use under each alternative in the draft CCP/EA is exactly that – an estimate. We acknowledge that this estimate may be too low, or it may be too high. Only time will tell.

Comment: Several people wrote that there should be more restrictions to access as this is a wildlife refuge and should protect natural resources. One thought it was a daunting task to control access in that there are some thirty million people within 4-5 hours of Canaan NWR.

Response: As we mention in previous responses in the section, some forms of public access are appropriate and compatible, and some are not. As in our previous responses, we refer readers to appendix B to learn more about how the Service determines whether a public use is appropriate and compatible.

Comment: One negative comment said, "This misguided pseudo-environmental anti human policy has been carried out in Canaan Valley by [staff at Canaan Valley refuge]. These individuals are truly anti-environmental because they are preventing present and future generations of true environmentalists' access to Canaan Valley. These…public servants need to be sent to Alaska or Nevada where they can lord over a Refuge without the hassles of human beings interfering with their ridiculous, and idealistic management practices. The condescending and elitist attitude expressed by your office, and Refuge employees has done irreparable damage to the Service and the Canaan Refuge. This can only begin to be repaired with your commitment to public involvement, and the increased access to the Refuge that was outlined in the Station Management Plan. I do not support any of your silly options outlined in the draft CCP. If I had to choose one, it would be Alternative B, with the increased access from Alternative C, no more trail closures, but with major revisions. The main rail grade from Camp 70 across the Valley needs to be opened. The original hydrology study done over ten years ago supports this. This rail grade provides the best access and the most environmentally sound path across the Valley. The engineering cost analysis of several of the cross-Valley routes done by a Boston based company was a ridiculous exaggeration, and obviously a set-up operation that did not go out for bid, and came up with the prescribed result desired by your office. In addition, opening this trail would solve the problem of a new trail coming anywhere near a residential area." Another commenter said roads destroy wildlife habitat; they don't create it.

Response: We find these negative comments to be unfortunate. In regards to a cross-valley trail from Camp 70, we addressed this issue in the draft CCP/EA, pp. 1-22 through 1-23, under "Issues Considered but not Further Analyzed in this draft CCP/EA," where we explain why this trail is not a realistic or viable option for the refuge at this time.

8.11 General Comments on Trails or Roads

(Letter ID#: 6, 21, 25, 38, 42, 57, 58, 59, 60, 98, 101, 106, 113, 114, 120, 121, 122, 138, 140, 143, 158, 162, 165, 169, 170, 175, 146, 179, 181, 182, 187, 189, 195, 201, 208)

There were about 43 general comments about trails or roads.

Comment: One person felt the refuge and its trail system has proved to be very good neighbors.

Response: We appreciate the support provided by this comment.

Comment: Many people wanted to see the refuge expand the total miles of trails within its boundaries. Some saw this as a benefit to the economy for example stating, "I would like to encourage the Refuge staff in one or the other of these alternatives to think about re-evaluating the existing trails on the Refuge to determine the possible expansion of their use designations and also expand at the same time…expand the total miles of trails on the refuge. I believe that that is going to be huge to the economic development of this area." While some others were opposed to more trails, as reflected in the following quote, "We are concerned and opposed to the building of trails across the valley or through prime wildlife habitat. The increased traffic could be very detrimental to this habitat and its natural inhabitants. Restriction of access to these areas north of Cortland Road (Old Timberland Rd) is critical for protection of habitat for upland birds. While we do acknowledge that trails for hiking, biking and related activities are important, there are over 375 miles of these trails, most of which also offer wildlife viewing, within about a one hour drive from the refuge. (Ref: wvtrails.com). Therefore building more trails with funding which could be used much more constructively should not be a high priority." Some felt that more trails would jeopardize wildlife habitat with statements such as: "Now our members are concerned and are opposed to the building of trails across the valley or through any prime wildlife habitat."

Response: We recognize that there will always be a difference of opinion regarding how many miles of refuge trails are open to the public. We feel that the final CCP strikes a balance between offering quality, wildlife-dependent recreational uses, and protecting the refuge's most valuable natural resources such as wetlands and other habitats associated with threatened, endangered or rare species. For more details on current and new refuge trails, see goal 4, objective 4.3 in the final CCP.

Comment: Several people commented that ski trails should be maintained. A representative comments states: "Ski trails are the most popular and heavily used trails on the Refuge. They provide important trail connectivity between Refuge recreational trails and facilities and trails on adjoining lands (see "increased trail connectivity" above). We have read and in general support the position of White Grass Ski Touring Center regarding the future use of Three Mile and Powderline Trails. White Grass has been a valuable contributor towards meeting many of the Refuge's important visitor use, volunteer, conservation and education goals. These ski trails are important to maintaining the delicate balance of these facilities being profitable and able to continue. All efforts should be made to do research and develop innovative means to limit the impact the trails have on protected species. Ways should be developed to mitigate any habitat degradation to allow these important Refuge visitor use areas to remain open to public use in a safe manner. Some people felt that property values would increase with more trails within the refuge."

Response: We agree that the environmental education and interpretation programs offered at White Grass Ski Touring Center (White Grass) help to foster environmental stewardship within the local community and beyond. The final CCP states that we will modify some trails (i.e., revegetate trail edges) for the purposes of improving habitat for the Cheat Mountain Salamander. The Cheat Mountain salamander is a threatened species and a priority for Service protection and management, according to the Endangered Species Act. The Service is therefore obligated to improve or enhance habitat for this species wherever and whenever possible. We will also increase monitoring on some trails to further our understanding of how these trails affect the salamanders, if at all, and to determine if there are other ways to improve salamander habitat. For more details on these strategies, see goal 4, objective 4.3 in the final CCP.

Comment: Several other people wanted to make sure mountain biking had adequate access to trails: "It would be a huge tragedy if even more trails were lost as our access between systems or areas are already fragmented. Mountain bikers have already suffered the loss of riding many miles of trails in the Dolly Sods North area just last year as it was designated a wilderness area. Other trails in the NWR have been closed in years past also. The Canaan Valley area has been featured in USA Today as being one of the top 10 towns with big backyards, and has always been featured as an outdoor mecca for lovers of outdoor recreation of all types. The NWR here seems to consume most of the land in the area, so residents and tourism itself (which is the only economy here) are really at their mercy. So I hope we can all work together to satisfy all parties and work on keeping and establishing the few sustainable non-impacting connector trails needed to get from point A to B by foot, bike or skis."

Response: We applaud this comment because it recognizes the importance of collaboration in the process of developing solutions to difficult issues. We agree that tourism is essential to the local economy and we are committed to doing our part to support this important industry, while at the same time ensuring compatibility with refuge purposes. Therefore, the final CCP states that we will expand the current bicycling opportunities by connecting bicycling trails and opening new trails, or portions of current trials, to bicycling. For more details on bicycling on the refuge, see goal 4, objective 4.3 in the final CCP.

Comment: One person thought all public roads and trails should be re-evaluated and all compatible uses should be allowed.

Response: Through the draft CCP/EA, all roads and trails were re-evaluated and all uses that were found to be compatible will be allowed on designated roads and trails (see appendix B of the final CCP). The six priority, wildlife-dependent public uses will be evaluated for compatibility every 15 years, and all other uses will be evaluated for compatibility every 10 years. However, the refuge manager may re-evaluate the compatibility of a use at any time (603 FW 2, parts 2.11 and 2.12). For example, we may revisit a decision sooner if new information reveals unacceptable impacts or incompatibility with refuge purposes. We will continue to follow the Refuge Improvement Act and the Compatibility Policy in determining which public uses to allow on the refuge.

Comment: The Tucker County Planning Commission wanted to see the addition of more trails.

Response: For details on where and how the trail system will be expanded in the final CCP, see goal 4, objective 4.3

Comment: Several people and organizations offered to help with trail maintenance and construction.

Response: We truly appreciate the offer of assistance and we will advertise volunteer opportunities on the refuge's web site. Those interested in helping with trail maintenance and construction should consider participating in the refuge's "Adopt-a-Trail" program. For more information contact Jackie Burns (304)866-3858 x35 or Glenda Crawford at the Trail Mix.

Comment: One person was not in favor of planting more trees along sections of trails to protect Cheat Mountain salamanders. Concerning revegetating along trails, several respondents felt that abandoned logging roads and trails should be revegetated, but not along currently used trails.

Response: The Cheat Mountain salamander is a threatened species and a priority for Service protection and management, according to the Endangered Species Act. The Service is therefore obligated to improve or enhance habitat for this species wherever and whenever possible. Therefore, the final CCP states that we will improve habitat on certain cross-country ski trails where these salamanders are known to exist. One method we propose is planting native trees on the edges of the trails to increase canopy cover. Increasing canopy cover will help improve leaf litter cover and decrease light penetration to the forest floor. For more information on strategies related to improving Cheat Mountain Salamander habitat, refer to goal 4, objective 4.3 in the final CCP.

Comment: A couple people opposed removing the old railroad grade. Another person wrote, "The closure of this main thoroughfare by Refuge management, without proof of wildlife or wild land impact, and against the wishes of all of the public that uses the Valley for wildlife dependant recreation, illustrates the problem that the mismanagement of the Refuge has created. The anti-democratic policy of guilty until proven innocent used by the Service here in Canaan needs to be abolished. Your failure to show any damage by non-motorized human recreation here backs this assertion up. Any future trail closures need to be studied first, and exposed to public scrutiny. Your closure, and destruction of the swinging bridge by the powers that be, without any input from the public, or replacement of the bridge, perfectly illustrates the arrogant attitude you possess. This cannot continue without further destruction of your reputation, although it can't become much worse. Considering the size of the Refuge staff and the budget, it is a mystery to me what all these people do for a living. The trail system is a mess, and gets very little maintenance. I guess everyone is too busy researching excuses, and closing trails to do any work on them. The effort put out here to enhance your "big six" priority public uses is nothing more than pathetic. The ignorance and apathy shown towards the trail system has had a negative economic impact on our tourist economy. Because of unsubstantiated trail closures by the Refuge, an excellent trail system was severely fragmented. Instead of working on improving this trail system, we are now trying to put the pieces back together again, and being forced to wade through the bureaucratic, regulation laden, and ridiculously overpriced process that the Service requires. The connections from Camp 70 to the other side of the Valley, from Rt. 32 to Canaan Valley State Park, from the Beall tract to the Main tract, and from Camp 70 to the CVI lands on river left need to be reestablished. The policy of closure of certain major trails to bicycles, but not to pedestrians has never been shown to be supported by valid evidence of any reason for this segregation. Specifically the trails on the Beall and Main tracts need to be reviewed, and reasons for this policy need to be clarified, or the trails reopened to bicycles. Sorry, but Refuge staff's personal prejudices are not a good enough reason for the basis of this division. Obviously, my belief that anyone will actually take any actions on these problems, let alone read this letter, is not very strong. This is due to the Service's record of not responding to the public, and their disregard for their own rules regarding public comment and participation on the numerous Compatibility Determinations resulting in trail closures. A problem I have noticed is the micromanagement of the Refuge by Hadley. I appreciate the impression given by the current Refuge manager, Mr. Shaffler, that he is trying to create trails, open trails and reestablish connections to other surrounding recreation areas. Please allow the people on the ground here in Canaan to call the shots. The mismanagers in Hadley are pathetically deficient in their knowledge of local lands, population and economy, so quit trying to run the show here in the Valley!"

Response: There are two old railroad grades that cut east-west across the valley. The northern-most railroad grade comes out of the Brown Mountain Overlook Trail and it is on this old railroad grade that we proposed in alternative C of the draft CCP/EA to create a new trail. While we appreciate the fact that this trail may have been open to the public before the Service acquired the property on which the trail is located, we did not choose this strategy for the Service-preferred alternative (alternative B) largely because of the trail's potential adverse impacts on the refuge's wetlands and associated plant communities. We determined that developing this trail would not contribute to achieving the refuge's purposes, vision, and goals, and it would not contribute to the conservation of Federal trust resources. See the draft CCP/EA, pp. 4-85 through 4-88, for a discussion on the potential impacts of this trail, which will further explain our reasons for not including this action in the final CCP.

Regarding other trails, the refuge conducted appropriateness and compatiblility determinations on bicycling first in 2003 and again during the CCP process. Through these processes, the refuge determined which trails can accommodate bicycling without materially interfering with the refuge purposes and the mission of the National Wildlife Refuge System. If new, compelling information presents itself we will consider reviewing these trails for other public uses.

A second old railroad grade to the south was addressed in the draft CCP/EA, under "Issues Considered but not Further Analyzed in this draft CCP/EA," as stated in a previous response under category 8.0.

Comment: Trail width was addressed by one commenter as a safety issue. They wanted wider trail corridors for safer winter skiing conditions

Response: The need to modify some cross-country ski trails (i.e., revegetate trail edges) for the purposes of improving habitat for the Cheat Mountain Salamander is addressed earlier in this section.

Comment: Many people supported a general north-south trail within the refuge.

Response: We appreciate the community's support for the general idea of a north-south trail within the refuge. The final CCP states that we will create such a trail, most likely from the Swinging Bridge Trail to Cortland Road. This proposed trail will require further NEPA analysis and public review before a final route is selected.

Comment: Canoe routes were suggested by one commenter.

Response: Visitors are permitted to canoe the Blackwater River through the refuge. Canoeists may put in at Timberline Road or Old Timberline Road, and may take out at Camp 70. For more details on canoeing, see goal 4, objective 4.3 in the final CCP.

Comment: Several people wanted to make sure buffer zones were placed between trails and private property.

Response: We assume this comment refers to the proposed north-south route from the Swinging Bridge Trail to Cortland Road. The proposed route as it was illustrated on the alternative B map in the draft CCP/EA appeared to follow property lines of many homeowners along Cortland Road. As previously stated, the exact route of this trail has not been decided and will require additional NEPA analysis. We will take this comment into consideration as we move forward with the more detailed planning analysis of this trail.

Comment: Some people wanted the refuge to minimize trail building. A representative comment states, "Minimize trail building. The Camp 70 to Cortland Road plan is acceptable because it is along

the boundary of the refuge. Additional trails across or through the refuge is extremely objectionable. There are hundreds of miles of trails surrounding the refuge."

Response: In the final CCP, we feel the number of new trail miles appropriately responds to the public's request for more trail connectivity, yet does not detract from the refuge's wilderness character.

8.12 Specific Trails, Roads or Areas

(Letter ID#: 3, 6, 13, 25, 40, 41, 42, 45, 47, 49, 51, 52, 54, 55, 56, 57, 59, 60, 64, 67, 76, 92, 93, 94, 96, 97, 100, 103, 104, 105, 106, 107, 108, 109, 110, 112, 116, 118, 132, 133, 134, 141, 143, 144, 145, 146, 149, 150, 155, 162, 165, 167, 168, 169, 173, 174, 175, 176, 179, 181, 183, 187, 189, 192, 194, 195, 199, 200, 202, 203, 204, 205, 206, 207, 209)

Within all categories this particular category received the most comments. Most people commented on a proposed trail which the public perceived would be along private property. This generated many comments, from private citizens to organizations to the State representatives to the governor of West Virginia. In addition, three petitions were signed from property owners near the refuge denouncing the proposed route. Almost all of these comments were not opposed to a north-south trail within the refuge and in fact supported such a trail. However, they believed the proposed trail would abut private land.

Comment: "…I am gratified to know that the plan alternatives offer increased hiking, hunting, fishing opportunities for visitors who hope to enjoy a wilderness experience in the refuge. With regard to the specifics of the plan, I do have serious concerns regarding suggested routes for hiking and biking trails. Let me emphasize that none of the alternatives under consideration affect me personally, however, this past weekend as I was approached by a number of Tucker County citizens and Canaan Valley residents, particularly distraught and concerned regarding the placement of these trails and immediate proximity to private homes. All the interested parties support a national wildlife trail in Canaan Valley but they emphasize the desire to have a true wildlife experience. When you place trails near homes, the visitors of those trails do not fully benefit from an exclusive nature wildlife experience and retreat as other trail options may present. Accordingly, I respectfully request that you consider any trail alternative plan that is not in plain sight of the residents of Canaan Valley. This would be a benefit to both the residents and the visitors. With thousands of acres in the refuge, I am confident that there are numerous options to the proposed alternatives that would enhance the opportunity to provide true wilderness experiences for visitors." Another commenter stated that a trail near private property could become a legal issue.

There were a couple comments that stated a trail near private property would enhance safety as local residents would utilize the trail and watch out for each other. Another person said that hikers are out to hike and not interested in other people's property.

Several respondents offered suggestions to insure that specific trails had buffer zones if located near private property.

Response: As we stated in the draft CCP/EA, and as we state in this final CCP, the proposal of a trail connecting the north and south ends of the refuge will require additional NEPA analysis before it is implemented because we have not yet decided on the site-specific characteristics of this proposed trail. We admit it was misleading to show a specific trail route on the alternative B public use map in the draft CCP/EA when we were not certain about which specific route that trail would take. We included this trail on the alternative B map to generate comments from the public regarding the idea of a general route, but the informal "line on a map" was insensitive to the neighboring community and we apologize for causing the unnecessary angst among local residents of Canaan Valley. Once we involve the community in developing a more detailed proposal, we will present alternatives to the public, solicit comments, discuss the preferred alternative as needed and then distribute a final plan. We will use e-mails, web postings and mailings to notify the public of any meetings and other opportunities to be involved in the development of the route. All the comments we have received

through this comment process regarding this specific trail will be taken into consideration when we begin the next phase of planning for this trail connection. In response to the many comments we received about this trail, we have amended the public use map for the final CCP to show the general vicinity where we envision a trail connecting the north end of the refuge to the south end, rather than showing a specific trail route.

Comment: Concerning Timberline area a commenter wrote, "No reference is made to the current access point within the Timberline Development that is referred to by refuge staff as an "administrative access" but serves as an access point to anyone living or visiting within the Timberline development area for the Middle Valley Trail (6.2 mile), Blackwater View Trail (1.4 mile) and those trails connected to these that are otherwise accessible to the general public only by the A-Frame Road Access. It functions as and is perceived in the community as a "private access" to the refuge. Additionally, no reference is made to the access provided by the right of way that Timberline Resort has through the refuge on Winterset Road (Idleman's Run Road) that serves, again, as a "private access" to Idleman's Run Trail (.39 mile) and Forest Road 80 (2.0 mile) for residents of and visitors to that area. These two areas should be documented and addressed within this background information and their current management outlined in Alternative A and compared in the other alternatives. I understand that the Timberline access was used in 2009 for additional deer hunting access. Include the details of this information in the background/Alternative A information."

Response: We understand that there is limited access to Middle Valley and adjacent trails. For this reason the final CCP states that the refuge will provide a parking lot and a trail connection from the Beall trails to Blackwater View Trail. This will enable visitors to park at Beall and access trails on the Main tract by foot, horse or bicycle, rather than having to drive to A-Frame Road to do the same.

Regarding the "road" from Winterset Road (Idleman's Run Road) to Forest Road 80, the refuge has no knowledge of restrictions on public access. The refuge provides access to Idleman's Run Trail and Forest Road 80 via Freeland Road and Forest Road 80, which are both open to the public. We do not promote access to either of those areas any other way.

Comment: Trail connectivity to specific areas concerned many commenters. Areas of concern were Beall to Middle Ridge Trail; Camp 70 area; Heart of Highlands trail system and connectivity with Canaan Valley State Park. Some people wanted to expand a trail system from Beall through Harper Tract and the Thompson area.

Bicyclists wanted to see the Cortland Road area opened to bicycling by connecting Beall to Middle Ridge. Some respondents also wanted the Brown Mountain Overlook Trail as well as Heart of Highlands trail system opened to bicycling.

Another commenter said, "You might take the access to Middle Ridge out of Alternative C and put it over into the preferred alternative and that would be a good move."

Response: Trail connectivity for all public uses was identified as an issue during public scoping, as noted in Chapter 2 of the final CCP. We therefore made a point to address this issue in the draft CCP/EA. The result is several strategies in the final CCP that connect trails on and off refuge and offer a variety of public uses when and where appropriate and compatible. For a description on actions related to trail connectivity in the final CCP, see goal 4, objective 4.3. For an illustrated rendering of newly connected trails, see the public use map in the final CCP.

Comment: One person was opposed to closing sections of the 3-Mile Trail and Powderline Trail and others stated this was the only safe access to Bald Knob.

Response: The proposal to close these two trails was part of Alternative D of the draft CCP/EA, which was not the alternative chosen for the final CCP. Therefore, this strategy is not included in the final CCP and therefore will not be implemented.

Comment: Several respondents opposed closing access to Freeland Tract to hunting or walking with dogs.

Response: As we explained in the draft CCP/EA, and in the final CCP, under goal 4, objective 4.3, the Freeland tract will be closed to public hunting, fishing, and walking with dogs, to promote a quality wildlife observation/education experience without other competing public uses. However, due to the refuge's concern with deer impacts to plant communities, particularly the rare conifer wetland community on the Freeland Tract, we will permit special hunts such as youth hunts and a special hunt for the physically disabled. We may also permit limited open hunts during the deer firearms season should browse damage indicate that closure of this tract has exacerbated deer damage.

Comment: One person suggested the refuge should accurately map the current and historic trail system: "Over 100 miles of trails were closed by the Refuge after the purchase of the Main tract, without any mapping, cataloguing or assessment. The trails that were closed on the Herz, and Elkins and Kelly tracts prior to that purchase were all done without the public participation or comment required by the Refuge Improvement Act. The one hydrology study of the cross-Valley railroad grade has been ignored. In other words, the desire of the USFWS to keep humans out of Canaan Valley has been implemented with a disregard for the Service's own rules and regulations. The Station Management Plan, which was the guiding document for the Refuge until now, has been ignored from day one, and was declared illegal by Refuge manager Kevin DesRoberts back in 1999."

Response: When we first acquired the Main Tract (the largest tract on the refuge), we mapped all the trails on this property. We then developed criteria for determining which trails to open to public use. When developing criteria, we consulted literature regarding trail evaluation, and we solicited expert opinion from experts in trail evaluation. Additionally, refuge staff brought in a hydrologist, a soil scientist, and an expert in wetland restoration to evaluate the railgrade and other potential trails. Soil types were obtained from county soil surveys. Recommended uses of soil types were also considered in evaluating trails. All this information was used to develop compatibility determinations in 2002-2003. After the compatibility determinations were released for public review, revised, and finalized, the refuge opened 31 miles of trail year-round, and an additional 10 miles of winter-only cross-country ski trails. For more information about this process, request a "Compatibility Determination Summary" from the refuge.

Under the final CCP, an additional 3.8 miles of trail will be open to public use. Through the compatibility process, the refuge has worked diligently to ensure the trails which are open to public access have the least impact on the biological resources while also offering the most quality wildlife-dependent recreational experience.

Comment: A respondent wanted access to the A-Frame area opened. Another wanted the refuge to: "…work out an arrangement with the Mountain Top Hunting Club so that people could use the two Cabin Mountain trails that begin at the end of A Frame Road and lead to the top of Cabin Mountain overlooking the Dobbin Slashings Bog. Many people camp on Raven Ridge within the Dolly Sods Wilderness, an easy walk from the parking area at the end of A Frame Road."

Response: Current legal restrictions prevent public access to the landlocked area north of the Main Tract. We will continue to look for opportunities to partner with adjacent landowners on trail connections in the area of the Cabin Mountain Trails.

Comment: One person felt access for White Grass was preferential versus the rest of the general public, writing, "…In the past, there seems to be special dispensation granted to some users and not granted to others. I can specifically mention White Grass or other events that are upcoming that are allowed to use refuge for profit but then other areas and other people are not. ... I think there in fact is a process … it seems as though the process is biased and that's only from someone who has been involved in the process and been refused. So it is concerning and yet I have a vested interest in it as I'm running a mountain bike program and being a past business owner in the valley …. and I don't want to hurt Chip or hurt anyone else but, you know, it really is a…it's something that I would like

to see not happen for 15 additional years. Not to say that he shouldn't be allowed to run his business but others should be allowed the same privilege. …in the six [wildlife-dependent recreational uses] … of the refuge, I don't see where … it should exclude one or include only one. …….. In a nutshell, could you explain what the compatibility is?"

Response: Allowing White Grass to operate some of its cross-country skiing and snowshoeing business on refuge lands constitutes a commercial use. Commercial uses on the refuge are evaluated on an individual basis using appropriate use and compatibility determinations, pursuant to 50 CFR § 25.61. We completed both an appropriate use determination and a compatibility determination for this commercial use as part of appendix B. Until the final CCP, this use has occurred pursuant to an annual special use permit issued by the refuge to White Grass under specific conditions. In the final CCP, we state that within five years of CCP approval, we will convert this special use permit to a concession contract, pursuant to Director's Order 139 and 50 C.F.R. 25.61. This Director's Order states that project leaders may use concession contracts to provide wildlife-dependent and other activities detailed in the National Wildlife Refuge System Improvement Act of 1997. This new process will require the refuge to prepare a prospectus and notify the public of available opportunities to operate a commercial concession on Federal land. Existing and previous concessionaires and any other interested parties will receive a copy of the public notice, making this a competitive process. We will conduct additional NEPA analysis if required.

Comment: Concerning access restriction, a person stated, "Restriction of access to those areas north of Cortland Road and Old Timberland Road for continued protection of the habitat for upland birds and other wildlife."

Response: Comment noted.

Comment: Several people wanted the A-Frame road repaired in its entirety.

Response: The portion of A-Frame Road which is in the greatest disrepair is the first four miles of this road, which the refuge does not own. Since we have no jurisdiction over this portion of the road, we are in no position to make improvements.

Comment: Many people commented on the Camp 70 road and access. These comments can be summarized by the following quote: "There are several ideas I support…[one] is to maintain Camp 70 road past the current parking area as a public vehicle access and perhaps put in an overlook of the valley view. This should be done regardless of ownership of camp 70." Other people commented on general road conditions and trail connectivity for this road and area. For example, one person wrote, "While appreciating refuge staffs desire to close Delta 13 Road/Camp 70 Loop, we believe they may be missing a unique Opportunity to provide vehicular access into this part of the valley. We encourage refuge staff to pursue abandonment of this portion of roadway by the WV Department of Transportation, thus allowing the Service to assume management control of the road. This will facilitate improvements to the pre-existing, but poorly conditioned Delta 13 road and the eventual creation of a scenic overlook at the terminus approximately 0.8 miles further into the refuge than currently exists. Not only will the hunting public benefit from this enhancement, but it will allow daily visitors access to an overlook area and potentially an observation platform from which to view the valley." Many people wanted the refuge to make sure the Camp 70 Road remained open.

Response: In response to comments about Camp 70 road, we have revised alternative B of the draft CCP/EA. As stated in the final CCP, goal 4, objective 4.3, we will work with WV Department of Highway (WVDOH) to develop a plan for improving this roadway for access by pedestrians, biking, horseback riding, and vehicles. The road will be improved from the refuge boundary to the northern portion of the loop, where it will end with a parking lot and a hardened overlook. The remainder of this road, starting with the southern portion of the loop and heading east, will be abandoned and maintained as a trail for pedestrian, biking, and horseback riding only. Once plans for the improved road and overlook are finalized, refuge staff will initiate the necessary environmental review and

compliance process. Implementation of the plan can only begin when that process is complete, and when the refuge gains jurisdiction over the road. For more information, please refer to the final CCP.

Comment: One person wanted to see vehicle access connectivity to the Dolly Sod Wilderness: "An additional change that I would like to see added to Alternative B would be vehicle access connectivity from the refuge to the Dolly Sod Wilderness area. I know that this is much more easily said than done, but due to the increase in hunters and hikers in the refuge, a road between these areas would be beneficial for emergency access issues, in the very least. Having it open to the public would also provide alternative entrance and exit from Dolly Sod, be much better than present routes, and one that would increase use and tourism for both areas. If not a practical suggestion now, inclusion in a future improvement plan should be considered."

Response: Currently the refuge provides access to Dolly Sods via Forest Road 80, which is open to pedestrians, horses, bicycles and vehicles. Vehicle and bicycle access is prohibited beyond the refuge boundary because Dolly Sods is a designated wilderness area and, as such, prohibits mechanized and motorized transportation. Only horses and pedestrians may travel into the wilderness area.

Comment: A respondent wanted the refuge to add the Big Chain Ring Trail: "…..add the Big Chain Ring trail to the existing trail development plan of the "Heart of the Highland Trail" organized and managed by Canaan Valley Wild Life Refuge. (see attached map of the area). The resort is a large and vital contributor to the economy of Canaan Valley with a trail system for recreational use tailoring to beginners and experts but above all, its trail system is designed for family activities. The owners and the management of Timberline Four Seasons Resort were not notified of the final phase of the planning of Heart of the Highland Trail System therefore that are late in requesting for one of their trails to be taken in consideration as an additional loop to the existing planned system. We feel that this particular trail will be a great asset for numerous reasons: 1). It interfaces with the present plan. 2). It provides access and has an economic impact for Timberline benefiting visitors of the valley. 3). We believe that networking between areas of the valley has educational value and promotes a balance between nature and commerce. 4). This particular trail has minimal negative biological impact. We feel this particular trail is very needed. Timberline Four Season Resort will take part in the maintenance plant."

Response: The CCP only deals with that part of the Heart of the Highlands trail system that is on the refuge land. Therefore the Big Chain Ring Trail at Timberline Resort is outside of the scope of this document. The Heart of the Highlands trail system is being developed by a committee that includes management from the various public lands it encompasses and representation from Tucker County Trails. The commenter should bring up this concern with the committee.

Comment: A commenter wanted to see more access to the Middle Valley trails from the Beall Tract.

Response: The final CCP as well as Alternative B of the draft CCP/EA states that we will connect the Beall trails to the Middle Valley Trails and allow access for bicycle, horse, and pedestrians. For more information about these and other trail connections, refer to the final CCP, goal 4, objective 4.3

Comment: One person said that White Grass skiers should be required not just encouraged to stay on trails. White Grass skiers could be required, rather than encouraged, to stay on designated trails. These skiers benefit from the use of Refuge lands and should be cognizant of their responsibility to behave appropriately.

Response: We agree that the language regarding off-trail skiing should be stronger. In the final CCP, we will change this wording to state that additional trail signage will "ensure" that skiers stay on designated trails.

Comment: Some respondents were concerned that specific trails would damage sensitive areas. For example one respondent wrote: "The proposed trail from the swinging bridge to Cortland Road, if built, should be routed with caution to avoid traversing wetlands. The "alternate route" shown on Map 3-5 clearly traverses a number of sensitive wetlands, and is not a suitable route. Constructing a new trail through currently unfragmented wetlands would introduce hydrologic disturbance, soil disturbance, create a vector for invasive species, and disturb sensitive wildlife. This would be in direct conflict with the mandate to improve biological integrity, diversity, and environmental health of the wetlands.

Response: We agree that the construction of a trail from Swinging Bridge to Cortland Road will have some impacts, as described in Chapter 4, "Environmental Consequences," of the draft CCP/EA. As stated in our first response in this section (Section 8.12, "Specific Trails, Roads or Areas"), we will need to conduct additional NEPA analysis on this action because we need to solicit additional public input on the exact route for this trail. This additional NEPA analysis will also include a more detailed analysis of the trail's impacts to the refuge's biological resources, among other things.

Comment: Constructing a trail from the Visitor Center to the Canaan Valley State Park would necessitate building a bridge over the Blackwater River and an extensive boardwalk over sensitive wetlands on either Refuge land or State park land. This proposal could be less damaging to the wetlands if the trail stays as close as possible to Rt. 32, possibly including planting of a narrow shrub/forest corridor between the road and the trail to improve the visitor experience. This is similar to the routing of rail trails, which typically parallel the road, and are very popular with recreational users. …….. Creating a cross-valley trail would permanently disturb some of the most sensitive wetlands on the Refuge, and appears incompatible with the mission of the Refuge."

Response: Before we implement this action of constructing a trail from the Visitor Center to the State Park, we will need to conduct additional NEPA analysis that will include public involvement and a more in-depth look at impacts to biological resources. We will take this comment into consideration as we engage in the next stages of that process.

We agree that creating a cross-valley trail would permanently disturb some of the most sensitive wetlands on the refuge. For this reason, we did not include this action in the Service-preferred alternative of the draft CCP/EA, nor did we include this action in the final CCP.

Comment: Several people were opposed to any specific trails proposed through wetlands.

Response: Comment noted.

Comment: One person asked the refuge to open up the Beall gate to hunter's vehicles.

Response: The final CCP as well as Alternative B of the draft CCP/EA states that we will open the Beall gate to allow hunters access to North Beall Road by licensed vehicle (only cars and trucks, no ATVs). For more information on this action see goal 4, objective 4.3

8.13 Overnight Parking

(Letter ID#: 35, 54, 57, 181)

Comment: Four people asked the refuge to allow overnight parking at the end of old Route 80.

Response: The final CCP as well as Alternative B of the draft CCP/EA states that we will allow overnight parking by special use permit on Forest Road 80 for visitors accessing and camping in Dolly Sods. Camping on the road or anywhere on the refuge is prohibited. Permits must be acquired from the refuge office in advance. To request a special use permit, contact the refuge by phone, fax, e-mail or mail.

8.14 Shuttle Service

(Letter ID#: 39, 57, 59, 74, 75, 98, 114, 118, 140, 142, 159, 165, 175, 182, 183, 193, 207, 209)

Comment: One person suggested a tram system be established within the refuge and another suggested a train or something similar. A couple folks thought a shuttle service for the elderly and disabled would be beneficial. Another person suggested utilizing the old railroad grades for a shuttle service.

Response: We understand the desire to provide universal access to the refuge. However, there are several reasons why we will not consider this proposal at this time. First, the cost to build and run a shuttle system would be prohibitive because the old railroad grades have deteriorated over time. Second, we feel this use would not be consistent with the goals and objectives of the CCP because it would not offer a high quality experience for wildlife-dependent recreation. Finally, we feel this type of use would have unacceptable impacts on the refuge's biological resources due to the potential scope of the construction and the nature of the activity. The refuge does, however, provide universal access on Freeland Trail, on the Timberline Road fishing pier, and at hunt blinds, by reservation. Furthermore, the final CCP states that the refuge will work with the West Virginia Department of Highways to build and maintain an accessible road and overlook at Camp 70.

Comment: Three people did not support a shuttle service to aid hunters.

Response: Comment noted.

8.15 Off-Trail Access

(Letter ID#: 57, 59, 74, 75, 114, 118, 140, 142, 165, 175, 182, 183, 207, 209)

Comment: Fifteen people commented on off trail access. Most of these wanted the refuge to allow off trail access. A representative comment states, "Allow off-trail pedestrian access for non-hunters (by foot and/or cross-country skis and snowshoes) within the same seasons – except spring turkey season and perhaps the first three days of deer rifle season - and areas as hunters are allowed this access to facilitate the priority uses of wildlife observation and photography. Most of the same justification used for hunting (page B-38) would be applicable to pedestrian use for Wildlife Photography & Observation – including providing the opportunity to actually view wildlife more readily than you can from a trail. Just as hunting would not be an effective tool if only conducted from a designated trail because of limited encounters with the wildlife, so is observation and photography limited in the same way. Do not offer this in such a limited and restricted fashion that is not supported by process and science and creates a non-user friendly and an inconvenient, staff intensive permitting and regulating process. Off-trail access will be self-limiting as most people prefer the reassurance of being on a trail and do not want to bushwhack or tromp through wetlands, nor do most people want to break trail through deep snow. It will allow opportunity for users of all levels of ability and interest." Several respondents agreed that off trail use should be with a permit system, but one person expressed that off trail access should be allowed without any permitting process.

Response: Although we proposed in alternative C of the draft CCP/EA to allow limited off-trail access, we did not include this proposal in the final CCP. We understand the argument that off-trail access would enhance wildlife observation and photography just as it enhances hunting. However, we believe we could not offer a high-quality hunting experience without offering off-trail access, whereas we can, and do still offer a high-quality wildlife observation and photography experience without off-trail access.

Comment: One person did not want the refuge to allow off trail use and said, "You cannot believe the change that has taken place and I know you are aware of it because we talk it all the time. What is going to happen though in the next 50 years will determine at the end whether we did the right thing in our planning. It's one of those hindsight things so we better get it right. The thing that

I have seen changed is, of course, the numbers of people, the numbers of activities. These are… these can be very bad, it can be negative on that place. It's sensitive to the point that there are scars up there yet where the Army used it, you can still find them, so it's a very sensitive area. In other words, you want to have people go up there where you can control is what I'm getting at. A hunter going through the woods is not like a mass of people. It's just some type of control. If you run a trail through there, it needs to be…hey you stay on the trail because if you start letting them go right and left and go on (inaudible-mumbled) a negative thing."

Response: Comment noted.

Comment: One person wanted to see the science behind allowing Sunday off trail permits: "I think this is Alternative C, the reference to the Sunday off-trail use and it's recommended that 25 permits per month will be released for Sunday off-trail use during the hunting season. Is there any science or process that backs up how that suggestion came about and if so, where in the 600 pages is it?"

Response: The proposal to permit a limited number of off trail users per month was developed as a number which the refuge staff felt was reasonable to accommodate the use as well as to define a number with which to measure change. We felt that defining the number at 25 could be found appropriate and compatible based on refuge policy which includes not only impacts to refuge resources but also other priority public uses and visitor safety. We chose 25 permits per month to start with because it averages out to a little less than one person per day over a month-long period, and we felt this would be the highest level of off-trail wildlife disturbance that we would tolerate on the refuge. Defining a maximum number of visitors using the resource is not uncommon. The U.S. Forest Service defines an average group size of 12-15 in wilderness areas that allow horses. Similarly on West Virginia Division of Natural Resources Wildlife Management Areas, group sizes are limited to 25 and those on bicycles and horses in groups larger than 10 are required to get a permit. These rules are generally created to protect wildlife and reduce user conflicts. There is a body of literature on the effects of humans to wildlife and many specific studies which compare the impacts of on vs. off trail use. Please refer to the draft CCP/EA, Chapter 4, "Impacts that would not vary by alternative; Impacts to Wildlife," and also "Impacts of Alternative C," where we address off trail use specifically. Because of our concerns with increasing disturbance to wildlife, the potential of increased user conflicts creating decreased quality of experiences, and the fact that off trail use is permitted on all public land surrounding the refuge, this proposal was not included in the preferred alternative of the draft CCP/EA, or in the final CCP.

8.2 Hunting

(Letter ID#: 5, 7, 9, 10, 11, 12, 15, 16, 18, 19, 20, 23, 25, 26, 39, 41, 46, 48, 53, 66, 95, 98, 104, 108, 115, 119, 131, 139, 141, 143, 162, 175, 197, 207, 208)

Comment: There were about 44 general comments concerning hunting. Most of these wanted the refuge to allow hunting and encourage its continued use. For example a representative comment says, "I represent the 46th Delegate District which is all Tucker and the southern half of Preston County and my reason for signing up is basically, I have gotten some correspondence in the mail and also some emails in reference to the proposed plans. I do have some questions I would like to ask, is that going to be permitted when I make a statement? ….The questions relate to basically the emphasis of the individuals who contacted me. Most of these guys have contacted me mainly because they knew my background as a hunter. I'm very… been a very avid hunter all my life and they know where I stand when it comes to that aspect of sports (inaudible-mumbled). A lot of these guys have used the refuge long before you guys got here back when they had cabins and (inaudible) and basically what they are saying is that they are not in favor of any plan that is going to do away with what is currently available in terms of hunting at the refuge and if you look at Alternative B, it looks like that might be an increase in their ability to be able to hunt and the emphasis that they give to me is, you know, under no circumstances would they like to give up what currently is in place and they would be adamantly in favor of the expansion of the opportunity to be able to continue to hunt in the refuge."

Response: Comment noted.

Comment: Several respondents wanted to ensure that hunting with rifles not be allowed near private residences. One person wrote that shrinking the rifle zones was a good thing. Also several respondents want the refuge to prohibit hunting in certain areas of the refuge: "Hunting: Public access trails should specifically be listed and managed as an "other place where people gather for pleasure" and hence it should be illegal to shoot a firearm within 400 or 500 feet of trails." It was also suggested that the refuge educate non-hunters [about] hunting presence on the refuge and its benefits as a management tool. Another person wrote, "Additional rifle areas are not required. Today's muzzleloaders and sabot slugs are effective to 150 yards and sometimes 200 yards. Adding additional rifle areas is not required to harvest more deer."

Response: As stated in the draft CCP/EA and the final CCP, we will modify "no rifle hunting zones" to open additional refuge lands to rifle hunting (see goal 4, objective 4.1). Many of these "no rifle hunting zones" were established to ensure safety during the hunt season. However, we believe that State regulations are adequate for ensuring safety and we see no reason to impose additional safety regulations on hunters. For more details on State safety regulations, refer to the compatibility determination for public hunting in appendix B of the final CCP.

Comment: One person thought hunting on the refuge should be controlled by a lottery system. Two people thought there should be more hunting blinds built rather than use a lottery system to access the two current blinds.

Response: Currently, the refuge is large enough to support all requests for hunting. Therefore, we do not need to implement a lottery system for hunt permits. We can generally accommodate all requests for the hunt blinds except during opening week for firearms season, during which time we implement a lottery system. However, if demand for these blinds increases we will consider building additional hunt blinds in the future.

Comment: A pro-hunting commenter wanting to protect sensitive species wrote, "Hunting is an excellent tool for managing populations of game animals. Special off-trail access to refuge lands is warranted to achieve those management objectives. Hunting should not be allowed for species that are rare or of concern for populations in decline or depressed."

Response: Although we proposed in alternative D of the draft CCP/EA to remove from the hunt list some species that are rarely seen on the refuge, this proposal was not included in the final CCP. Regulations for species considered rare, such as Wilson's snipe and Virginia rail, are made by the U.S. Fish and Wildlife Service on a flyway level and from a population management standpoint. As such, hunting of those species on the refuge is not likely to significantly affect regional or national populations. While we understand the desire of some members of the public to remove these species from the hunt list or to prevent off-trail access which would facilitate the hunting of these species, there is no scientific evidence that permitting this type of use materially affects the local or flyway populations of these rarely seen species. In addition, refuge hunt surveys submitted for the past five or six years have documented only about a half-dozen snipe or rail taken from refuge lands.

Comment: Several people disagreed with hunting as a management tool. One person stated, "…….. the philosophical change to the mission of Fish and Wildlife is wrong, allowing hunting, trapping, and kill assistance within the refuge is wrong…"

Response: Hunting is one of the six priority public uses to receive enhanced consideration on national wildlife refuges, according to the 1997 Refuge Improvement Act (Public Law 105-57; 111 Stat. 1253), which amended the National Wildlife Refuge Administration Act of 1966 (16 U.S.C. 668dd-668ee). The Service strongly encourages refuge managers to provide visitors quality hunting opportunities when and where hunting is compatible with refuge purposes and the mission of the National Wildlife Refuge System. We have found hunting to be compatible at Canaan Valley National Wildlife Refuge and therefore we will continue to allow it.

Comment: A commenter wrote concerning the Freeland Tract: "My suggestion for the Freeland Tract hunting closure is to close only the open area surrounding the boardwalk. My main concern is that the hawthorn and woods area to the northeast of the open field area (containing the boardwalk) be left in huntable area. This portion of the Freeland Tract contains good early successional habitat and woods that could easily be converted to such habitat and should be left available to hunters. If I'm not mistaken, this area also contains a handicapped accessible hunting blind. If this area is open for "special deer hunts", it should also be available for other forms of hunting." Another stated, " I am oppose to closing of the Freeland Tract to hunting (except deer), fishing, or walking dogs. Much hunting occurs from November through February when most other uses have greatly declined. This proposal would decrease recreation use when user conflicts would be minimal. (perhaps only hunters, fishermen should be allowed on public hunting lands -- banning all other public would minimize user conflicts, avoid disturbance of game, create less disturbance of other wildlife, etc. !! See where I'm coming from? Let's all try to live together!) I would recommend that blaze orange be required for all visitors on refuge lands during hunting seasons for safety reasons. (Pennsylvania has this requirement on their game lands.)"

Response: As stated in our fifth response under section 8.12, "Specific Trails, Roads or Areas," we will close the Freeland tract to public hunting, fishing, and walking with dogs, to promote a quality wildlife observation/education experience without other competing public uses. With the exception of a few closed areas near busy roads and populated areas, the entire 16,000-acre refuge is open to hunting. Furthermore, we permit dogs on more than 30 miles of trails and fishing is permitted on miles of river and stream habitats throughout the refuge and on neighboring conservation lands. In summary, we feel there are ample opportunities for hunting, fishing and dogwalking on the refuge, and prohibiting these public uses on the .4-mile Freeland Trail and on 76 acres of land on the Freeland Tract would not detract from these opportunities.

The accessible hunt blind is not located on the Freeland tract.

8.3 Upland Bird Hunting

There were no comments in this category. Some comments mentioned grouse and woodcock hunting, but their comments were about early successional forests.

8.4 Deer Hunting

(Letter ID: 13, 21, 41, 62, 81, 95, 97, 101, 140, 143, 176, 178, 180)

About 12 comments were directed toward deer hunting and all were in favor of increased deer hunting or in favor of hunting as a management tool to decrease the deer herd. One person asked the refuge to assist hunters with deer extraction, while one person asked how the refuge would implement assisting hunters with deer extraction. A couple others wanted to have increased rifle deer hunting. One person wanted a bow hunting only area and wrote, "I understand that controlling deer population is a high priority of the hunting aspect of the draft CCP. I agree with increased antlerless deer harvest but disagree with opening more areas to rifle hunting. As the plan says, every hunter has a different opinion of what makes a good hunting experience. I would like to see at least one area turned to a bow hunting only area, this would provide bow hunters with a quiet place to hunt and provide non-hunters an area to recreate without worrying about rifle shots and contribute to the overall tranquility of the Refuge. Bow hunters often stop hunting during rifle season, so a bow only area would be a draw for bow hunters from throughout the State. Increased doe take could be facilitated by extra doe stamps for the refuge hunting areas rather than increasing rifle hunting areas."

Response: We appreciate the support in our efforts to increase the deer harvest on the refuge. As stated in the draft CCP/EA and the final CCP, we will provide a shuttle system to help deer hunters with extraction. The purpose of the shuttle will be to transport bagged deer, not to transport people. For more details on the shuttle, see goal 4, objective 4.1

With regards to bow hunting, the refuge will continue to provide an archery-only hunt area on the refuge east of Route 32, adjacent to Black Bear Woods. Bow hunters can also hunt anywhere on the refuge during the State's archery-only season, which begins before any of the other State deer seasons. We understand

that some bow hunters may prefer a more solitary experience, but we believe the State archery season and the refuge's archery-only hunt area are adequate for providing a quality archery hunting experience.

8.5 Raccoon Hunting

(Letter ID#: 13, 36, 53, 139, 175)

Comment: Two responses were against raccoon hunting. One such comment was against hunting raccoons and encouraged the refuge to gather supporting data stating, "Data should be collected on the impacts of night hunting for raccoons under all Alternatives. There is potential for damage to wetland habitats and sensitive wildlife that is disproportionate to the recreational experience gained by a few individuals." Three comments favored night raccoon hunting.

Response: We agree that habitat damage and wildlife disturbance can occur with night hunting. However, due to the low number of night hunters, we believe that this activity causes very little wildlife disturbance or habitat damage. As stated in the compatibility determination for hunting in appendix B of the final CCP, hunter survey information from the refuge indicates that from 2002 to 2005 a total of only 10 people hunted raccoon on the refuge.

8.6 Trapping

(Letter ID#: 13, 41, 60, 95, 175, 209)

Comments: Of the seven comments, two were for trapping of beaver and five were against trapping. An indicative comment against trapping stated, "The CCP seems to neglect the benefits of beavers. They provide early successional habitats in areas inaccessible to human management, and provide such habitat in riparian areas that are desirable for a number of wildlife species, including woodcock. I assume issuance of special use trapping permits are within State statues." A pro-trapping commenter wrote, "Beaver trapping and control should be conducted by refuge staff or contractors if public trapping is insufficient for management goals. Since this management strategy protects the rarest wetland communities on the Refuge, it should be included in all Alternatives." The other pro-trapping comment stated that only the public should be allowed to trap, not staff or contractors.

Response: In the rationale for objective 1.2, under goal 1, we explain that beaver activity and the flooding of low lying areas is a natural and important disturbance process in Canaan Valley. With few natural predators, however, the beaver population threatens sensitive plant communities with prolonged inundation. Our actions related to beaver management in the final CCP are aimed at reducing the threat of inundation of rare plant communities by proactively trapping through a special use permit issued by the refuge. In the compatibility determination for public beaver trapping (see appendix B of the final CCP), we state that if public trapping does not resolve impacts to refuge resources, refuge personnel and/or refuge-appointed contractors will be assigned to remove problem animals.

8.7 Fishing

(Letter ID#: 21,101, 113, 175)

Comment: Three comments were pro-fishing and one wanted to know if fishing was addressed in the CCP.

Response: We appreciate the comments supporting fishing. Fishing is addressed in goal 4, objective 4.2 of the final CCP.

8.8 Multi-day Recreation

(Letter ID#: 13)

Comment: Two people stated that multi-day recreation on the refuge was not necessary as it is provided by other agencies and in other areas.

Response: Comment noted.

8.9 Dogs, Horses, Bicycles

(Letter ID#: 2, 13, 53, 54, 139, 141, 163, 167, 175, 195, 208)

Comment: One person wrote, "The impact of bicycle and horse use on Refuge lands should be carefully considered for all trails, especially those in the vicinity of limestone substrates or wetlands. Soil compaction, hydrologic alternation, drainage problems, erosion, and creating vectors for invasive species are typical concerns." One person questioned designating unsuitable trails for biking: "I would further like to question the designation of trails for biking and hiking on routes that are not yet suitable for biking. It is difficult to understand why biking is allowed where it is clear that it is destructive and inconsistent with good trail maintenance. Once the trails are improved to support bike traffic designations can be expanded. I have raised this concern with NWR personnel and will continue to do so." Another person suggested restricting bicycles because they cause erosion.

Response: We agree that bicycle and horse use can cause damage to refuge resources, as explained in chapter 4, "Environmental Consequences," of the draft CCP/EA. We also agree that many of the trails that allow these uses are in need of maintenance to better support these public uses. However, bicycling and horseback riding provide easier and quicker access for many visitors who may not otherwise experience the refuge's habitats and other resources. For this reason, we allow these uses but limit them to trails where they will have the least impact.

Comment: Several people were upset with the wording of "pursuit dogs" in the CCP. One such respondent wrote, "I have got a real problem here. It's a minor one but it really bothers me and that's the word 'pursuit dogs' and I am going to read this again and I'm talking about the derogatory nature of the comment 'pursuit dogs'. I don't want anyone to envision my English Setters or any other dog breed with horns of the devil baring large fangs while in pursuit of a grouse or woodcock. I suggest you use the term 'hunting dogs' instead of 'pursuit dogs'. ..... There is a sentence on page 50 under Impacts that is bothering. It reads, although some members of the public may consider the use of pursuit dogs inhumane, that issue is not commonly mentioned during public's scoping. I am recommending that this entire sentence be stricken from the document if indeed it was mentioned in scoping, then there is a real need for mentioning it here, however, then I would like to see you strike the word 'may' and change 'pursuit dogs' to 'hunting dogs'."

Response: We agree that the words "pursuit dogs" are inflammatory and misrepresent the situation. We removed this wording from all hard copies of the draft CCP/EA and from the on-line version of the draft CCP/EA. We have also removed this wording from the final CCP.

Comment: Some people were against allowing hunting dogs on the refuge.

Response: Comment noted.

Comment: One person thought ATVs should not be allowed and felt that restrictions on horses were ok.

Response: All-terrain vehicles (ATVs) are not allowed on the refuge. Horses are restricted to designated trails.

9.0 Alternatives

9.1 General Comments on Alternatives

(Letter ID#: 13, 60, 63, 74, 75, 77, 79, 95, 131, 134, 175)

Comment: About 11 people had general comments concerning the alternatives and generally described parts and pieces of the various alternatives that they liked or disliked. For example: "The four Alternatives presented in the CCP are (A) Current Management, (B) Emphasis on Focal Species, (C) Emphasis on Expanding Priority Public Uses, and (D) Focus on Managing for Historic Habitats. Alternative A, the "no action" alternative, will not reduce the overpopulation of deer or increase ESH acres. Alternative D will allow forest structure to mature without consideration of the needs of USFWS focal species in decline that require shrublands and young forests for survival. For these reasons, WMI strongly opposes the adoption of Alternatives A and D."

Response: Comment noted.

Comment: One person stated that CVNWR should not influence adjacent property owners: "CVNWR should not be involved with getting adjacent landowners to adopt the refuges management strategies. These landowners have the right to manage their land as they see fit within the law. They should not be subjected to pressure, or even personal contact, by refuge staff regarding their property management. Wildlife habitat management cooperation by individual landowners should be the responsibility of the WVDNR."

Response: We agree that private landowners have the right to manage their property any way they want and the refuge should not pressure private landowner to manage their property in any particular way. However, the refuge is always willing to work with private landowners who are interested in managing their property in a way that would maximize opportunities for wildlife and wildlife habitats.

Comment: Several people wanted to know if the Alternatives were firm as separately stated or would the refuge adopt parts of each alternative into the final proposal. One such comment stated, "So it's realistic to think that Alternative B can be the plan that is chosen but in its final form, it may be amended to include some piece that shows up in C or D or to exclude some piece that shows up in B if that's what the public comments lead you to. Is that correct? …….Then I could have used X, Y and Z…Okay. So it's not so much about either or's as it is about shades of grey and prioritization and I think that's what I'm hearing?"

Response: It is true that, based on public comments and other factors, we can take different parts of different alternatives from the draft CCP/EA and put them together to develop the final CCP.

Comment: One commenter wrote, "How much flexibility…once you decide on an alternative and you implement it…start implementing it, it's a 15 year plan…how much flexibility do you have to make changes as things come up? You know you find a trail that may not be doing what it should be or it's blocking something. You can make changes within… ……. Okay, it's like a guideline? ….Would you have public hearings or comments?"

Response: As stated in the final CCP, at the end of Chapter 2, periodic review of the CCP will be required to ensure that we are implementing management actions and are meeting the objectives. Ongoing monitoring and evaluation will be an important part of that process. Monitoring results or new information may indicate the need to change our strategies. We will follow the procedures in Service policy and the requirements of NEPA for modifying the CCP, its associated documents, and our management activities as needed.

9.2 Actions Common to All Alternatives

(Letter ID#: 86, 178)

Comment: One person asked if there was a table comparing all alternatives.

Response: Yes, there is such a table. Table 3.1, "Summary Comparison of Management Actions by Alternative," is located in the draft CCP/EA at the end of Chapter 3.

9.3 Alternative A—Current Management (No Action)

(Letter ID#: 60, 134, 161, 166, 172, 185)

Comment: One person asked if Alternative A was the old Station Management Plan.

Response: Alternative A in the draft CCP/EA is not the old Station Management Plan. Instead, alternative A satisfies the National Environmental Policy Act (NEPA) requirement of a "no action" alternative, which we define as "continuing current management." It describes our existing management priorities and activities, and serves as a baseline for comparing and contrasting alternatives B, C and D.

Comment: A person wrote that Alternative A should be adopted and available refuge funds should be sent to the Gulf of Mexico oil disaster cleanup.

Response: Comment noted.

Comment: Most people favoring Alternative A wanted to see enhanced wildlife security, while some did favor opportunities for wildlife observation and photography. Two people opposed Alternative A as being too restrictive. One such comment said, "I oppose Alternative "A" in principle because I believe if you're not moving forward you are going backward, there is no "stay the same". In my opinion, current refuge management policy was based on a "revolving door manager" system where basically the biologist determined what would happen and the manager agreed to it because the manager knew he/she would not be at CVNWR long enough to make a difference. I disagree with this style of management. The biologist works for the manager. The biologist suggests courses of action; the manager decides what actually is going to be done. I believe one purpose of the Draft CCP/EA is to MAKE PROGRESS in the management of the refuge for the next 15 years. If this is the case why would anyone support Alternative "A"."

Response: These comments have been noted and factored into our decisions regarding the development of the final CCP.

9.4 Alternative B—Focal Species (Service Preferred Alternative)

(Letter ID#: 2, 17, 21, 24, 25, 34, 36, 42, 44, 50, 54, 58, 60, 65, 67, 97, 98, 125, 161, 165, 166, 168, 170, 172, 178, 184, 185, 190, 195, 205)

Comment: Thirty-two comments referred to Alternative B. One person wanted to know what methodology was used to identify focal species.

Response: The process for establishing focal species is explained in appendix E of the final CCP.

Comment: One person stated that allowing increased access for hunting and fishing was a "carrot" dangled to entice the public to agree with the alternative. They stated, "The following are comments specific to the other proposed Alternatives. Alternative B is the preferred alternative listed in the Executive Summary.

The proposed additional access to deer hunting and fishing makes this option look attractive to the local population and to the tourist population, but in reality few locals hunt on the refuge because of the popularity of the local hunt clubs and few tourists hunt on the refuge because the average tourist wants to see and photograph the local wildlife and fauna rather than kill it. Therefore, additional hunting is really only a carrot to dangle and is not a solid justification for the additional resources that would be needed to fund the additional staffing and programs called for by this alternative."

Response: We respectfully disagree with this comment. During the public scoping process, and since the refuge has been created, hunters and anglers have long asked for increased access to the refuge. Therefore, it was our obligation to address this issue in the CCP. Furthermore, proposals for additional staffing and funding are not solely tied to increased hunting and fishing opportunities. Rather, additional staff is needed to help support enhanced environmental education programs and to an enhanced habitat management program.

Comment: Many people supported Alternative B because it focused on wildlife. For example a respondent wrote, "As a bird watcher and regular visitor to the refuge, I support the adoption of Alternative B to the CCP for the refuge. Focal species management by forest type combined with control of the growing deer herd would best help to achieve effective management practices." The Nature Conservancy and Pennsylvania Game Commission supported Alternative B.

Response: We appreciate the support for alternative B, the Service-preferred alternative from the draft CCP/EA.

Comment: The West Virginia Division of Natural Resources Wildlife Resources Section appreciated the refuge's work and process, but disagreed with refuge habitat management strategy: "The Wildlife Resources Section (WRS) of the West Virginia Division of Natural Resources (DNR) appreciates the time, effort and resources invested by the U.S. Fish and Wildlife Service (Service) in preparing the draft Comprehensive Conservation Plan (CCP). Recognizing the importance of this Refuge to West Virginia's sportsmen and women and other outdoor recreationists, the Director of the DNR and Chief of the WRS dedicated staff time to support the Refuge throughout the entire CCP process. In addition to the numerous Core Team and public input meetings, stakeholder group exercises, subject specific focal group discussions with outside experts and the seven public comment meetings, WRS has been an active participant and supporter of the Service and this Refuge. While we recognize that this refuge is not a wildlife management area, we still believe that the habitat management priority and emphasis identified in the Preferred Alternative (B) is insufficient and somewhat misguided and we cannot provide complete concurrence with this alternative. Because the acreages proposed for management are almost identical across alternatives (Table 1), we are compelled to focus on management priorities." This comment letter by WVDNR goes on to say that since "the refuge is essentially surrounded by spruce forest, our belief [is] that this area's uniqueness is due to the early successional shrub component and expansive wetlands." As such, WVDNR asks the refuge to place less emphasis on activities such as spruce forest restoration.

Response: After receiving these and other comments from WVDNR, we met with our colleagues from WVDNR to discuss their comments. On the issue of spruce forest restoration, the refuge agrees that in some areas spruce forest is reseeding naturally, but we believe that active restoration is important to accelerate the reestablishment of this forest type in appropriate areas on the refuge, especially where adequate seed sources do not exist. The WV Wildlife Action Plan also identifies spruce forest as a community type of management concern and along with it a host of wildlife species tied to these communities, including the threatened Cheat Mountain salamander, which are both State and Federal priorities for conservation. The view of spruce restoration's importance within the Central Appalachian region is shared and supported by a multi-agency organization which includes representation from WVDNR. While the refuge understands the uniqueness of the shrubland and other early successional habitat in the Valley, we believe that management actions to support red spruce restoration do not detract from these other habitat values. In addition, working to restore historic habitats helps the refuge meet the Service's Biological Integrity, Diversity and Environmental Health policy (601 FW 3). The refuge also must evaluate its contribution of habitats on a landscape scale and working to improve and restore spruce forest habitat on the refuge will help achieve larger goals within the State and ultimately within the Appalachian Landscape Conservation Cooperative.

Comment: Some people objected to Alternative B stating, "I am not in agreement with Alternative B, which has been identified as the Refuge preferred Alternative. I am not in favor of increased access for deer hunters, nor do I support efforts to reduce the deer population from the refuge. What I have noticed in the past 5 years is a significant decrease in the deer population already, and frankly speaking, that is why I love to go to Canaan Valley and spend time in my vacation home – to see the wildlife and enjoy their presence. WV already offers a tremendous abundance of hunting land, and I am not in favor of giving increased access to more hunters in the Canaan Valley."

Response: According to WVDNR officials, deer densities based on number of bucks killed per square mile differ and range from 17 to over 30 on refuge lands between 2002 and 2006. Surveys conducted in the Timberline Homeowners development by the WVDNR estimated 46 deer per square mile in 2003 and 59 deer per square mile in 2004. Current management of deer in Tucker County targets a density of 25-30 per square mile (Taylor 2009). Refuge observations and forest inventory data suggest that current deer densities are affecting balsam fir survival and impacting forest understory development. Managing the deer population to maintain species diversity and natural processes is an integral component of maintaining the health of the refuge's wetland complex.

Comment: And another person wrote, "Although the NWS prefers Plan B, we do not believe Plan B is in the best interest of this property, because it states: "we would increase opportunities for wildlife-dependent recreational uses by, for example, promoting trail connectivity and offering more programming. Funding and staffing would increase to support enhanced . . . public use programs." The reason we object to this option is because we believe promoting trail connectivity would result in overuse and damage to sensitive wildlife habitats, and would increase use by some who are inappropriate users. As it stands, trail maintenance and trail marking in CVNWR are minimal, at best, and deserve sensitive upgrades for sustainability and to assist pedestrian access through the refuge. More trail connectivity would likely attract inappropriate use by mountain bikers and ATV riders, which are currently not permitted in this refuge."

Response: The National Wildlife Refuge System Improvement Act defines wildlife observation, photography, environmental education, and interpretation as priority public uses that, if compatible, are to receive our enhanced consideration over other general public uses. Permitting these uses provides opportunities for the public to enjoy wildlife and plants on the refuge in accordance with the law, and produces better-informed public advocates for Service programs. Providing trail connectivity facilitates many of these uses.

We agree that there are some impacts associated with public use, such as trampling vegetation and disturbance to wildlife near trails. However, stipulations to ensure compatibility will make these impacts minimal. For example, by limiting bicycling and other uses to designated trails, disturbance will be limited and manageable. For more information on how public uses are compatible with refuge purposes, see the compatibility determinations in appendix B of the final CCP.

We also agree there is a possibility that trail connections create more opportunities for illegal activities such as ATVs. The refuge's law enforcement officer and other refuge staff will remain vigilant for these illegal activities and will prosecute violators to the fullest extent of the law.

9.5 Alternative C—Emphasis on Expanding Priority Public Uses

(Letter ID#: 8, 13, 60, 67, 132, 161, 166, 184, 185, 192)

Comment: Ten comments referred to this alternative. Most commenters stated that this alternative would have detrimental impacts on wildlife. For example one person wrote, "It is clear from this table that Alternative C has the most negative impacts and the fewest benefits for almost every factor assessed, including air quality, hydrology, water quality, soils, upland forests, freshwater habitats, all wetlands, fisheries, and T&E species. …… Given that Alternative C is the only Alternative that threatens to have major cumulative negative impacts (4-84), it is logical to remove this Alternative from consideration." Another person thought Alternative C would require substantial additional resources, writing: "Alternative C is objectionable because like Alternative B it will require substantial additional

resources and will also be the most invasive to the current natural state of the Wildlife Refuge. There is no justification for adding or subtracting trails, or old roads or railroad grades. Indeed this would cause the most disturbances to the current natural environment."

Response: Comments noted.

Comment: Those in favor of this alternative supported increased public access, for example stating, "Alternative C has more public access and that should be considered as well." A respondent also wrote, "I would be most supportive of Alternative "C" with the following specific changes, in addition to any other applicable comments above: Maintain the current level of invasive species monitoring and control. Red Spruce planting by volunteers only, with no refuge support other than site selection. No additional construction of deer exclosures. Increase the number of public trails in spruce forest since trails limit disturbance. No Special Use Permit required to hunt rabbits on the refuge. Specific inclusion of a trail to be constructed between the Camp 70 area and Cortland Road nearest the Beall Tract. No off trail Special Use Permit requirement. Construction of the Environmental Education Pavilion on the Beall Tract. Absolutely no use changes for the Freeland Tract that would limit the experience for any pedestrian type of use be it hunting, fishing, bird watching, dog walking on a leash, ETC."

Response: We appreciate these specific comments related to this alternative. Based on this and other comments we received on the draft CCP/EA, we have modified alternative B from the draft document by including some strategies that were proposed in alternative C. For the full list of management actions, see chapter 4 of the final CCP.

9.6 Alternative D—Focus on Managing Historical Habitats

(Letter ID#: 13, 161, 172, 184, 185)

Comment: Five comments were received concerning Alternative D. Some respondents favored this alternative feeling it had the fewest negative impacts. A person wrote, "Alternative D has the fewest negatives impacts and the most benefits for these factors, and the preferred Alternative B is intermediate. ……. I strongly favor Alternative D as providing the greatest benefits to the public in terms of responsible stewardship of globally significant habitats, T&E species, State species of concern, water quality, and air quality."

Some respondents appreciated some aspects of this alternative, but questioned other aspects. For example a respondent wrote, "Alternative D calls for limited disturbance of already-disturbed areas, however, it would actively manipulate what is now a natural state and [it] would seek to accelerate the aging process [and it] would create an unnatural state in what is supposed to be a natural environment. Alternative D would also require additional resources. In conclusion, I do not believe that the expenditure of additional funds to maintain this National Wildlife Refuge is fiscally reasonable or justifiable."

Response: These and other comments regarding this alternative have been considered and evaluated in regards to the management direction discussed in the final CCP.

Comment: One person thought this alternative was too restrictive in its public use. Another felt Alternative D would be inappropriate in allowing mature forest to eventually dominate: "We strongly believe that an emphasis on development of mature forest conditions throughout the refuge is inappropriate for Canaan Valley NWR given the Service's mission and Canaan Valley's landscape context. Mature forest habitat is generally increasing in the Appalachians, and a relatively small proportion of mature forest wildlife species are of conservation concern. In contrast, grassland and early successional habitats, along with a large proportion of the wildlife species that depend on them, have declined precipitously in recent decades. As noted in the CCP, implementation of Alternative D would result in the eventual disappearance of these species from the refuge. Mature forest habitats are already well-established in the Allegheny Mountains, and approximately 10 percent of the adjacent Monongahela National Forest is set aside as wilderness, providing large acreages that will essentially be managed "hands off' as mature forest in perpetuity. The limited value that would accrue to the region's wildlife

from additional mature forest acreage on the refuge is far outweighed by the benefits of a more active management regime, with an emphasis on early successional species. We agree that there is value in maintaining older forest on certain areas of the refuge for some focal species, and note that Alternative B includes management actions to address this need."

Response: We agree that shrub management is a priority for the refuge, but that shrub management does not preclude managing for other habitat types. We also agree that alternative B from the draft CCP/EA offers a reasonable balance between managing priority shrub habitats and ensuring the ecological integrity of the refuge's mature forested habitats.

9.7 Research Natural Area

(Letter ID#: 13, 60, 101, 162, 175, 195, 208)

Comment: Six comments were in favor of a research natural area. One such comment stated, "The establishment of a Research Natural Area is highly appropriate within the CVNWR. Botanical Research Areas exist on Federal land in similar settings at twenty-seven locations in the Monongahela National Forest, including such areas as Bear Rocks bog, Fisher Spring Run bog, Big Run bog, and Cranberry Glades. The wetlands of Canaan Valley are significant natural areas with biodiversity value to the nation, and would benefit from this additional study and protection."

Response: We appreciate the support for the Research Natural Area.

Comment: One person suggested reducing the size of the research natural area to 593 acres.

Response: Alternative C in the draft CCP/EA proposed to create a 593-acre Research Natural Area (RNA), while alternative B proposed to create a 754-acre RNA. We proposed the smaller RNA in alternative C because we predicted it might have less of an impact on hunting. Except for deer hunting and beaver trapping, all other hunting is prohibited in the RNA. However, upon further analysis, we realized that most of the shrubland habitat within the larger RNA exists as either narrow bands (alder) or scattered shrubs within a saturated moss-dominated or emergent wetland. Therefore the habitat suitability for hunted species such as American woodcock is low and the designation will have little effect on the hunter opportunity for game species. We chose to include the larger acreage in the final CCP because it was a more ecologically cohesive unit and it would make a larger area available for this important designation.

Comment: One comment was against establishing a research natural area: "We strongly disagree with the proposal to establish a 754 acre Research Natural Area. 754 acres is about 14 percent of the 5,370 acres of wetlands within the refuge. While we are in agreement that research is important, (especially for our colleges and universities), there are volumes of research findings available to these institutions. In our Lake states for example (Michigan, Wisconsin and Minnesota) are hundreds of thousands of acres of wetlands and bogs. The universities of these states have conducted years of research on these areas. I believe that some of these projects are ongoing. It is only a few hours travel to Michigan and Wisconsin for participation in research."

Response: We agree that there are many resources available for locating different types of biological research. However, the purpose for the creation of this RNA is to study this particular area, which constitutes a prime example of high elevation/Central Appalachian wetland plant communities. As a component of the largest wetland complex in the State of West Virginia as well as containing the largest contiguous peatland and shrub swamp plant communities, the specific area designated for this RNA meets the criteria of an ecological community that illustrates characteristics of a physiographic province or biome. Research on these types of ecological communities is not readily available, and the refuge would like to be a part of contributing to whatever research exists.

9.8 New Alternatives Proposed by the Public

There were no comments in this category.

9.9 Cumulative Effects

(Letter ID#: 13)

Comment: One comment stated that the refuge needs to take into account what is happening around it and said, "In managing for biological integrity, diversity, and environmental health, it is important to take into account the landscape context of the Refuge. This is particularly important in terms of management for early successional landscapes. The needs of the many species that benefit from this type of habitat must be balanced with the needs of species that require forest interior habitat. At CVNWR, the surrounding landscape is a mosaic of forested, early successional, and developed land. It includes large areas of public land, which provide relatively unfragmented and often forested landscapes. However, the State parks also include managed recreational landscapes (golf course, mowed areas, constructed facilities, roads, trails) and early successional landscapes, both managed and natural. The Monongahela National Forest on Dolly Sods includes forest and natural open wetland herbaceous and shrub communities, along with areas of early successional grassland and shrubland which are in very slow recovery from past logging, burning and grazing disturbance. There are also large tracts of private land that border the Refuge. These private lands are largely non-forested or highly fragmented, including strip mines, agricultural areas, and ski slopes. Finally, pipeline and powerline rights-of-way provide early successional habitat and also forest fragmentation. All of these adjacent fragmented or early successional landscapes, in addition to the relatively unfragmented national forest lands, should be considered in developing the land management goals on the refuge. The refuge does not exist in isolation, and the trust species using the refuge habitats will not know where the boundaries are."

Response: We agree that it is important to consider the refuge "in context" when developing land management goals. For example, we recognize that the refuge plays a particularly important role in providing early successional habitat because the refuge is surrounded by a sea of mature forest. Also, we recognize that grassland habitat on the refuge that lies adjacent to privately owned grassland habitats provide the most valuable grassland habitats in the area because together, they are of large enough size to support breeding grassland bird populations. Through these and other examples, we show that we do, indeed, consider the larger landscape when we develop land management plans.

9.10 Wilderness Review

(Letter ID#: 175, 60)

Comment: Two comments were received; both were opposed to wilderness designation in the refuge. One stated that no portion of the refuge should be designated as wilderness. The other thought some of the refuge area qualified: "The Wilderness Review completed for the CCP found two (the text on page 3-16 said 1 area, and the chart beginning on page C-5 shows 2 areas) areas of the refuge that complied with the criteria for inclusion as wilderness areas, but for other reasons would not be designated as such at this time. After reviewing the criteria in the table beginning on page C-5, it is my opinion that none of CVNWR qualifies as wilderness area. The history of the area tells us that Canaan Valley is in its present environmental condition due largely to the influence of man. Canaan Valley has been farmed, timbered, hunted, trapped, fished, gas and power line traversed, ATV abused, and recreationally and commercially used in many other ways for generations. The footprint of man is undeniably and irretrievably visible in every area of the valley. There is no way it should be realistically considered for wilderness designation. This evaluation should be reconsidered from a purely scientific point of view, not from a personal opinion of the beauty and diversity of the area, and reversed."

Response: As stated in appendix C of the final CCP, after conducting the inventory phase of the wilderness review process, we have determined that Wilderness Inventory Areas (WIAs) 7 and 10 qualify as Wilderness Study Areas. However, we have decided that we cannot complete the wilderness review process at this time, but instead will complete it within 3 years of approval of the final CCP. During the review process, we may find, as the above comment suggests, that the two WIAs are not suitable for wilderness designation. However, this determination cannot be made until the review process is complete.

Attachment 1. Letter Identification.

Letter Number	First Name	Last Name
1	Dennis	Labare
2	Charlie	Nichols
3	Richard F.	Horan
4	Not Given	Not Given
5	Robert	Fanning
6	Lee & Brenda	Miller
7	Robert L.	Fischer
8	Ron	Avlestock
9	Doug	Yanak
10	Willis	Bentley
11	Karl	Petro
12	Charles G.	Hunter
13	Elizabeth	Byers
14	Allan	Phillips
15	Michael E.	Gushue
16	Ellen	Not Given
17	Gregory L.	Whitt
18	Stephen	Feagans
19	Carroll T.	Allen
20	James	Rea
21	Eileen & Stanley	Smith
22	Eileen & Stanley	Smith
23	Rick & Linda	Layser
24	Karen	Mueller
25	Chuck L.	Strickland
26	John R.	Bonham
27	Peter	Shoenfeld
28	Cindy	Phillips
29	Dave	Lesher
30	Roger	Lilly
31	Julie	Dzaack
32	Ken	Dzaack
33	John M.	Chapman
34	Michael B.	Harmon
35	Jim	Kirk
36	Jeff	Beardmore
37	Peter	Shoenfeld
38	Dave	Truban
39	Chris	Moyer

Letter Number	First Name	Last Name
42	Bob	Beabin
43	Not Given	Not Given
44	Judy & David	Bitting
45	J. R.	Nolan
46	Stanley E.	Shaver
47	Bruce	Dalton
48	Mike	Snyder
49	Jeanne Jeane	Odom
50	Timothy J.	Heater
51	Joe	Manchin III
52	Rodger	Lundell
53	Walter	Lesser
54	Jim & Barbara	Smith
55	Eileen & Stanley	Smith
56	Bruce	Wilson
57	Mary Ann	Honcharik
58	Carol	Schimpff
59	Roger	Lilly
60	Ken	Dzaack
61	Mike	Dant
62	Ron & Deb	Dolly
63	Scott James	Williamson
64	Leon	Johnson
65	Bruce	Tenney
66	Dick	Wilson
67	Keith	Strausbaugh
68	Merrill	Warden
69	Carol	Schiff
70	Tommy	Zikes
71	Inaudible	Inaudible
72	Steve	Schim
73	Honey	Snyder
74	Julie	Zach
75	Skip	Stemble
76	J.R.	Nolan
77	Ben	Herrick
78	Pete	France
79	Bobby	Snyder
80	Mona	Woods
81	John	Merrifield
83	Randy	Reed

Letter Number	First Name	Last Name
84	Merrill	Whittaker
85	Inaudible	Inaudible
86	Thomas	Wood
87	Robin	Cable
88	Keith	Kran
89	Rita	Haverty
90	Inaudible	Inaudible
91	Inaudible	Inaudible
92	Melodie & Lane	Jones
92	Kathryn H.	Ortt
92	Jim & Jean	Odom
92	John & Leah	Cooper
92	Lee	Miller
92	Brenda	Miller
92	Joel	Foster
92	Wade K.	Miller
92	Stephen	Haid
92	Alicia	McCormick
92	George F.	Lynch Jr.
92	Doug & Myra	Martin
92	Bruce & Geraldine	Wilson
92	Patricia	Snow
92	Stephen K.W.	Chock
92	Elaine M.	Chock
92	Joe	Massi
92	Sara	Massi
92	Michael W.	Chapman
92	Yvonne	Chapman
92	Helen Manos	Lynch
92	Joh H. & Debbie	Brown
93	Murry	Deerborn
93	Margaret	Collom
93	Jeff	McLaughlin
93	Richard F.	Horan
93	Aila M.	Casielma
93	Karen	New
93	Freda & Carney	Ratliff
93	Glenda	Crawford
93	W. D.	Runyon
93	Jonathan	Collom
93	Sadie	Johnson

Letter Number	First Name	Last Name
93	Jay & Heidi	Hamric
93	David	Smigal
93	Becky	Smigal
93	Janice H.	McCarthy
93	Donald O.	Schultz
93	Carolyn H.	Schultz
93	Mike & Christi	Dant
93	Joyce	Runyon
93	John A.	Moulds
93	Charles & Judith	Sturtz
93	Dan & Lisa	Gillogly
93	Kim	McLaughlin
93	Cathryn	Deerborn
93	Tom	Vogel
93	Paul N.	Silvestri
93	Bethany A.	Good
93	Jean E.	Moulds
93	Janet	James
93	Kathleen M.	Snider
93	Frederick W.	Fisher
93	John M. & Naomi D.	Williams
93	Jeff & Becky	Grandin
93	Elizabeth	Smigal
93	Joseph D.	Henry
93	Jann	Nugent
93	Leon C.	Johnson
93	Susan & Andy	MacQueen
94	Jeff	Grandin
94	Dan	Sullivan
94	Vincent J.	King
94	James & Heidi	Hamric
94	William	Geary
94	Megan	Padden
94	Janice H.	McCarthy
94	Thomas & Kathleen	Gauss
94	Jonah	Miller
94	Zach	Miller
94	Jonathan	Collom
94	Margaret	Collom
94	Christine	Bible
94	Sonya	Bible

Letter Number	First Name	Last Name
94	Dave	Bible
94	Danielle	Burk
94	Amy	Dulin
94	Rich & Heather	Musselman Musselman
94	Bronwyn	Lewis
94	Donald	Schultz
94	Carolyn H.	Schultz
94	Erica	Long
94	Joseph	Henry
94	Charles	Smith
94	Kimberly	Covert
94	Paul	Grandin
94	Elizabeth C.	Smigal
94	Kate	Friend
94	Allen	Meadows
94	Siobhan	Covington
94	Jerry	Cosner
94	W. D.	Runyon
94	Jann	Nugent
94	Glenda	Crawford
94	J. E.	Kinkaid
94	Ed	Ride
94	Leon	Johnson
94	John & Naomi	Williams
94	Frida & Carney	Ratliff
94	Karen	New
94	Aila M.	Casielma
94	Richard	Horan
94	Sadie	Johnson
94	Joyce	Runyon
95	William K.	Ijo
96	John	Williams
97	John F	Merrifield III
98	Walt R	Shupe
99	Roger	Lundell
100	Joel W.	Foster
101	Eddie	Hinkle
103	Stephen E.	Haid
104	James R.	Good II
105	Stan	Shaver

Letter Number	First Name	Last Name
106	Jim	Good
107	John	Williams
108	Jason	Lab
109	Steve	Nadel
110	Joe	Henry
111	John	Richard
112	Inaudible	Inaudible
113	Ken	Dzaack
114	Bruce	Dalton
115	Peter	Schopel
116	Keith	Strausbaugh
117	Ruth	Gordon
118	Julie	Zach
119	Jason	Webb
120	Mr. (Not Given)	Zach
121	Andie	Dalton
122	Julie	Halperson
123	Carol	Fletcher
124	J.R.	Nolan
125	Steven	Convo
126	Bill	Smith
127	Janet	Preston
128	Paul	Burns
129	Stephen	Kimbrell
130	Not Given	Not Given
131	Stan	Shaver
132	Geraldine	Wilson
133	Leo	Wilson
134	Roger	Lilly
135	Not Given	Not Given
136	Not Given	Not Given
137	Not Given	Not Given
138	Not Given	Not Given
139	Walt	Lesser
140	Barbara Sanders	Hannah
141	Steve	Wilson
142	Not Given	Lindell
144	Tom	Vogel
145	Steve	Haid
146	Joe	Drenning
147	Alex	Lachard

Letter Number	First Name	Last Name
148	Senator Bob	Williams
149	Laurie	Quattro
150	Not Given (probably Stanley E.)	Shaver
151	Jim	Green
152	Kim	Bennett
153	Gary	Verdi
154	Brenda	Miller
155	Jim	Good
156	Not Given	Not Given
157	Not Given	Not Given
158	John	Williams
159	Kim	Not Given
160	Kermit	Bennet
161	Laura	Milam-Hannin
162	Marilyn	Shoenfeld
163	Patrick "Cully"	McCurdy
164	Debbie	Snyder
165	Todd	Romero
166	William D.	Oliver
167	Donald	Schultz
168	Mike	Powell
169	Benjamin A.	Herrick
170	Stephen	Schimpff
171	Mike	Dant
172	Nicholas & Monica	Rumsey
173	Mike & Christi	Dant
174	Frank	Maguire
175	Julie	Dzaack
176	Athey	Lutz
177	Toni & Bill	Witzemann
178	Amy	Cimarolli
179	Matthew	Marcus
180	Pamela	Lutz
181	Helen	McGinnis
182	Karen	Jacobson
183	John	Richard
185	Sherri	Spizzirri
185	Dennis	Labare
186	Julie	Dzaack
187	Chip	Chase
188	Gary	Berti

Letter Number	First Name	Last Name
189	Tom	DeScisciolo
190	Paula Jean	Hallberb
191	Chip	Chase
192	Sara	Lampo
193	Bill	Peterson
194	Bob	Bealem
195	Don	Casper
196	Susan	Pierce
197	Roger	Lilly
198	Jeremy	Golston
199	Joel & Rosemarie	Foster
200	Lee & Brenda	Miller
201	David	Beckner
202	Andrea	Dalton
203	Joseph	Henry
204	Murray G.	Dearborn
205	Curtis I.	Taylor
206	Jennifer N.	Taylor
207	Marilyn	Shoenfeld
208	Peter	Shoenfeld
209	Charlie & Mary	Waters

Appendix K

Dave Menke/USFWS

Cedar waxwing

Finding of No Significant Impact

Finding of No Significant Impact
Canaan Valley National Wildlife Refuge
Comprehensive Conservation Plan

In May 2010, the U.S. Fish and Wildlife Service (Service) published the draft comprehensive conservation plan and environmental assessment (CCP/EA) for Canaan Valley National Wildlife Refuge (NWR). The 16,193-acre refuge was established in 1994 to conserve and protect fish and wildlife resources and the unique wetland and upland habitats of this high elevation valley. The refuge is located in Tucker County, West Virginia, and has an approved acquisition boundary of 24,000 acres. It includes the largest wetland complex in the State, and encompasses the headwaters of the Blackwater and Little Blackwater rivers. The refuge's draft CCP/EA evaluates four alternatives for managing the refuge over the next 15 years. It carefully considers their direct, indirect, and cumulative impacts on the environment and their potential contribution to the mission of the National Wildlife Refuge System (NWRS). The draft CCP/EA restates the refuge's purposes, creates a vision for the next 15 years, and proposes five goals to be achieved through plan implementation. Alternative B is identified as the Service-preferred alternative. Chapter 3 in the draft plan details the respective goals, objectives, and strategies for each of the four alternatives. Chapter 4 describes the consequences of implementing those actions under each alternative. The draft plan's appendixes provide additional information supporting the assessment and specific proposals in Alternative B. A brief overview of each alternative follows.

Alternative A (Current Management): The Council of Environmental Quality regulations on implementing the National Environmental Policy Act (NEPA) require this "No Action" alternative, which we define as current management. Alternative A includes our existing programs and activities and serves as the baseline against which to compare the other alternatives. It would maintain our present level of refuge staffing of seven full-time and two term employees. It would continue the following priorities of the biological program: shrubland and grassland management for migratory birds, protection and monitoring of threatened and endangered species, red spruce and balsam fir community restoration, upland and wetland habitat restoration, invasive plant monitoring and eradication, and rare plant and animal conservation. We would continue efforts to protect the Federally threatened Cheat Mountain salamander, the federally endangered Indiana bat, and the recently delisted West Virginia northern flying squirrel by monitoring known populations, inventorying suitable habitat for new populations, and researching habitat limitations. We would continue to offer a hunt program that is in accordance with State seasons. We would maintain current access sites for fishing and boating, and current trails for wildlife observation and photography. We would continue to offer our current level of environmental education and interpretation programs as staffing and funding allows. Finally, we would continue to collaborate with partners to promote the natural resources of Canaan Valley through outreach and public awareness.

Alternative B (the Service-preferred alternative): This alternative represents the combination of actions we believe most effectively achieves the purposes and goals of the refuge and would make an important contribution to conserving Federal trust resources in West Virginia and in the central Appalachians. It is the alternative that would most effectively provide low-impact wildlife-dependent recreation and would address the significant issues in Chapter 1 of the draft CCP/EA. It is designed to balance the conservation of a mixed-forest matrix landscape with the management of early successional habitats and the protection of wetlands. The habitat-type objectives in the plan identify focal species whose life and growth requirements would guide management activities in each respective habitat. Alternative B addresses the refuge's mandate to consider managing refuge habitat under the Biological Integrity, Diversity and Environmental Health Policy (601 FW 3). Also in this alternative, we would designate 754 acres of the refuge's central wetland complex as a Research Natural Area. The hunt program would remain the same as Alternative A, except we would facilitate the removal of more deer from the refuge by providing more access into the interior of the refuge and by opening more land to rifle hunting. We would officially open the refuge to fishing by amending 50 CFR 32.68 and we would promote fishing opportunities. For increased wildlife observation and photography, the refuge would create more trail connections. We would also expand visitor center hours, build a new environmental education pavilion, and increase the number of environmental education and interpretation programs. We expect a 15 percent increase in visitation under this alternative. To fully implement Alternative B, we would add 3.5 positions to the Canaan Valley NWR staff, for a total of 12.5 positions.

Alternative C (Emphasis on Expanding Priority Public Uses): In Alternative C, we would increase access and infrastructure to support more priority public uses than any of the other alternatives. We would create a cross-valley trail that would run east-west through the northern part of the valley, and we would allow limited off-trail use in a designated area. With these improvements in the public use programs, we expect refuge visitation to increase by 20 percent. With an increase in public access and infrastructure development, we anticipate a greater need for monitoring and control of invasive plants. We would also encourage additional research that would assess whether increased public use affects wildlife behavior, including nesting, feeding, and resting. We therefore propose in this alternative to have a staff of 13.5, compared to a staff of 12.5 in Alternative B. Within the biological objectives, differences are more subtle and emphasize early successional habitat management over forest stand improvement. Although the Biological Integrity and Diversity Policy would still guide some management of the forested and unique wetland plant communities, this management would mostly be in the form of protection and conservation rather than restoration. The Research Natural Area in this alternative would be 593 acres, compared with 754 acres in Alternative B.

Alternative D (Focus on Managing for Historic Habitats): This alternative strives to establish and maintain the ecological integrity of natural communities within the refuge. Management would range from passive, or "letting nature takes its course," to actively manipulating vegetation to create or hasten the development of mature forest structural conditions shaped by natural disturbances such as infrequent fires, ice storms, and small patch blow-downs. Under this alternative, no particular wildlife species would be a management focus. We would pursue wetland restoration projects where past land uses have altered historical plant communities or have hindered natural hydrological flow. We would also promote research and development of applied management practices to sustain and enhance the natural composition, patterns, and processes within their natural range in the Central Appalachian Forest. As in the other alternatives, we would ensure protection of current or future threatened and endangered species, and we would control the establishment and spread of non-native, invasive species. We would create the same 754-acre Research Natural Area as planned under Alternative B. Also in Alternative D, we would limit new visitor services infrastructure to already-disturbed areas, such as around the refuge headquarters and visitor center facility, the Freeland tract, and roadside pullouts along A-frame Road. We would enhance hunting and fishing opportunities in ways similar to Alternatives B and C. Under this alternative, we would expect a 10 percent increase in visitor use, which is the same as alternative A. To fully implement this alternative, we would add 2.5 positions to the Canaan Valley NWR staff for a total of 11.5 positions. One of these would be a law enforcement officer to help enforce stricter limitations on visitor use.

We distributed the draft CCP/EA for a 45-day period of public review and comment from June 1, 2010, to July 16, 2010. We received 312 responses, both oral and written, representing individuals, organizations, and State agencies. Appendix J in the final CCP includes a summary of those comments and our responses to them.

After reviewing the proposed management actions, and considering all public comments and our responses to them, I have determined that the analysis in the EA is sufficient to support my findings. I am selecting Alternative B, as presented in the draft CCP/EA, with the minor changes listed below, to implement as the final CCP. Changes we made in the final CCP are:

1. A new map, labeled "Map 4.2, Public Use," and located in Chapter 4, clarifies our proposal to connect the Swinging Bridge Trail to Cortland Road. This proposed trail connection will require further NEPA analysis and public review before a final route is selected. Therefore, the new map in the final CCP shows the general area within which we hope to build this trail connection, rather than an actual line on a map, as was shown in the draft CCP/EA.

2. In the final CCP, we will work with the West Virginia Department of Highway to develop a plan for improving Camp 70/Delta 13 for access by pedestrians, biking, horseback riding, and vehicles (see the final CCP, Chapter 4, objective 4.3). Vehicle access on Camp 70 was proposed in Alternative C of the draft CCP/EA, but not in Alternative B. Due to public comment in support of vehicle access on this road, we decided to include this action in the final CCP. Although we discussed some of the potential impacts of this action in the draft CCP/EA, we will need to conduct additional detailed analysis on this action before it is implemented.

3. In the final CCP, we changed the language of objective 3.1 to state that 75 percent of the 114 acres of aspen woodland will be managed in the 0-15 year age class. We removed language in the strategies identifying the annual target for cutting and replaced this with a statement that identifies the aging nature of the 114 acres of aspen communities requiring accelerated management if these communities are to be maintained as aspen habitat. We also included language in objective 3.1 that identifies the need for the management and conservation of aspen communities not identified in the CCP due to limitations of existing vegetative mapping coverage.

4. In the final CCP, we changed language in objective 3.2, regarding northern hardwood forest edge cutting, so that no annual limits are put on this type of cutting. Limitations presented in the draft CCP/EA reflected considerations for available personnel to conduct activities during the appropriate seasons as well as seasonal access restrictions. However, given previous conversations with the West Virginia Department of Natural Resources (WVDNR) and other partners, we believe that opportunities exist to help achieve management of this habitat over the life of the CCP. As such, the refuge will not state maximum annual acres, which would limit our ability to conduct hardwood forest edge cuts and would limit opportunities to work with partners over the life of the CCP.

5. In objective 3.3 of the final CCP, we moved the identification process for dry alder communities to the 1-3 year time frame to prioritize locations for effective alder management. These dry alder communities will be identified prior to any habitat management plan.

6. We corrected all format and typographical errors that were brought to our attention.

I concur that Alternative B, with the above changes and in comparison to the other two alternatives, will: best fulfill the mission of the NWRS; best achieve the refuge's purposes, vision, and goals; best maintain and, where appropriate, restore the refuge's ecological integrity; best address the major issues identified during the planning process; and is most consistent with the principles of sound fish and wildlife management. Specifically, in comparison to the other two alternatives, Alternative B provides the biggest increase in the diversity, integrity and health of high quality habitats, through enhanced early successional habitat and forest management. It also provides the most reasonable and effective improvements to existing public use programs that are in high demand, with minimal impacts to wildlife and habitats. The plans to increase staffing and develop new infrastructure are reasonable, practicable and will result in the most efficient management of the refuge and best serve the American public. This Finding of No Significant Impact includes the EA by reference.

I have reviewed the predicted beneficial and adverse impacts associated with Alternative B that are presented in Chapter 4 of the draft CCP/EA, and compared them to the other alternatives. I specifically reviewed the context and intensity of those predicted impacts over the short-and long-term, and considered cumulative effects. My review of each of the NEPA factors to assess whether there will be significant environmental effects is summarized here (40 C.F.R. 1508.27).

(1) Beneficial and adverse effects – we expect the final CCP (Alternative B) management actions to benefit both the wildlife habitats and the unique wetlands of Canaan Valley. Important examples include the measures to reduce deer browse damage to trees and shrubs, restore hydrology altered by old logging roads and trails, maintain rare habitat types, and reduce flooding of sensitive plants by beaver dams. These benefits will not result from any major change in management strategy, rather they will result in incremental changes to the current management. Therefore, we do not anticipate any significant beneficial or adverse effect on the human environment.

(2) Public health and safety – we expect the good safety record of the refuge to continue based on the protective actions provided in the stipulations of the compatibility determination for each of the authorized public uses on the refuge. There should be no significant impact on public health and safety from the implementation of the CCP.

(3) Unique characteristics of the area – the primary, unique characteristic of the Canaan Valley is its extensive wetland system in the headwaters of the Blackwater River. We expect the preservation and restoration measures in the CCP, such as the creation of a Research Natural Area, to benefit these wetlands for which the refuge was created, and to benefit the surrounding rare habitats. As in #(1), the benefits will be incremental to the effects of the ongoing management measures originally instituted to protect these resources. Thus, we do not expect these incremental benefits to result in a significant impact on the human environment.

(4) Highly controversial effects – the management actions in the final CCP such as field mowing, early successional habitat restoration, deer hunting, and other wildlife-dependent recreational uses are time-tested measures. Their effects on the refuge are well studied and widely known from past management and monitoring. There is no scientific controversy over what these effects will be. Thus, there is little risk of any unexpectedly significant effects on the environment.

(5) Highly uncertain effects or unknown risks – the management measures in the final CCP are evolutionary: they are mostly refinements of the existing management measures that we have used since the Service established the refuge in 1994. We have a comprehensive monitoring program in effect to reassess the effectiveness of each planned improvement. With the data available on the current management results and the system in place to adjust for any unplanned effect, we do not find a high degree of uncertainty or unknown risk that the CCP will cause any significant impact on the environment.

(6) Precedent for future actions with significant effects – the purpose of the CCP is to establish the precedent for managing the refuge for up to 15 years. The effects of that management are designed as gradual improvements over the existing conditions, not global changes. For example, strategies such as mowing or cutting to maintain early successional habitats are proposed on a rotational basis over the course of several years. Therefore, we do not expect this precedent to cause any significant impact on the environment.

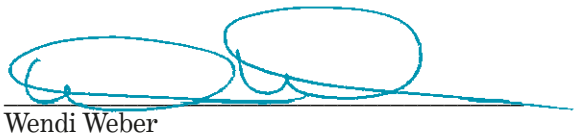
(7) Cumulatively significant impacts – the CCP provides the programmatic, long-term management plan for the refuge. We plan to coordinate with surrounding land managers to promote common goals such as reducing browse damage from deer and providing trail connections to enhance wildlife-dependent, recreational uses. Our management jurisdiction is limited, however, to the refuge lands, and we do not foresee any of the coordinated activities rising to the level of a significant effect on the environment. Within the term of the CCP, we intend to pursue additional projects such as constructing trail connectors and fishing access points. We will review the alternatives for these projects and their effects in additional NEPA studies tiered from the draft CCP/EA. Further, we will examine the cumulative effects of all projects under the CCP before they are approved and we will conduct whatever level of additional NEPA review is warranted.

(8) Effects on scientific, cultural, or historical resources – the archaeological and cultural studies summarized in the CCP showed no significant impacts on these resources from the planned management activities. Service cultural resource managers in the regional office keep an inventory of known sites and structures and ensure that we consider them in planning new ground disturbing or structure altering changes to the refuge. Throughout the implementation of the CCP, we will continue to consult with the West Virginia Division of Culture and History (West Virginia's State Historic Preservation Office [SHPO]) concerning projects which might affect sites and structures, and we will continue to conduct or contract archaeological or architectural surveys when needed.

(9) Effects on Endangered Species Act (ESA)-listed species and habitats – as detailed in the CCP, we have completed a consultation with the Service's Ecological Services Field Office under Section 7 of the ESA. Their endangered species specialists have concurred in our biological assessment that the planned actions are not likely to adversely affect any of the ESA-listed species that may be present on the refuge, particularly the endangered Indiana bat and the threatened Cheat mountain salamander. The CCP also protects the recently delisted West Virginia northern flying squirrel. Our management actions are designed to preserve and improve the existing habitat for these species and there is no ESA-designated, critical habitat on the refuge. Therefore, we do not anticipate any significant effects on these ESA resources.

(10) Threat of violating any environmental law – our habitat management actions are designed to benefit the environment. They will comply with all applicable protections such as the Clean Water Act and the Clean Air Act. Pursuant to the National Wildlife Refuge System Administration Act (16 U.S.C. 668dd(e)(3), 668dd(m)), we have coordinated closely with the WVDNR in developing the habitat management plans and the fish and wildlife regulations for the refuge. Our public hunting and fishing programs under the CCP require all participants to comply with State regulations. Our beaver trapping program, which protects rare plant habitats, also requires each user to be State-licensed and in compliance with all regulations. We do not anticipate a threat that the CCP will violate any environmental law or cause any significant impact on the environment.

Based on this review, I find that implementing Alternative B will not have a significant impact on the quality of the human environment, in accordance with Section 102(2)(c) of NEPA. Therefore, I have concluded that this Finding of No Significant Impact is appropriate and an Environmental Impact Statement is not required.



1/19/11

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February 2011