U.S. Fish & Wildlife Service

# Inventory and Monitoring Plan

## Seney National Wildlife Refuge and Satellites (Kirtland's Warbler WMA, Harbor Island NWR, Huron NWR, and Michigan Islands NWR)

Photo Credit: Greg Corace

March 2016

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Inventory and Monitoring Plan

Signature Page[1]

| *Action* | *Signature /Printed Name* | *Date* |
|---|---|---|
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[1] Signatures apply to all contents of the HMP.

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## Introduction

This Inventory and Monitoring Plan (IMP) documents applied research, inventory, and monitoring (collectively referred to as surveys) that will be conducted at Seney National Wildlife Refuge (NWR) and satellites (Kirtland's Warbler Wildlife Management Area (WMA), Harbor Island NWR, Huron NWR, and Michigan Islands NWR, in part) from 2016 through 2031, or until the Comprehensive Conservation Plans (CCP) and Habitat Management Plans (HMP) are revised.

The majority of surveys considered in this plan address resource management objectives identified in the CCPs (Seney NWR and Kirtland's Warbler WMA 2009; Michigan Islands 2012, as part of larger group) and HMPs (Seney NWR and Kirtland's Warbler WMA 2013; Michigan Islands NWR 2015) for these stations. A few surveys are a continuation of past monitoring conducted for the purpose of understanding long-term trends in specific resources or are part of state, regional, and/or national survey efforts. This IMP was developed according to the Inventory and Monitoring (I&M) policy (701 FW 2) for the National Wildlife Refuge System.

Seney NWR, located in the eastern Upper Peninsula of Michigan, was established in 1935 by Executive Order under the *Migratory Bird Conservation Act* for the protection and production of migratory birds and other wildlife. The refuge encompasses approximately 95,238 acres; 25,150 acres comprise the Seney Wilderness Area in which is contained the Strangmoor Bog National Natural Landmark. While management for migratory birds is paramount, the refuge provides habitat for a diversity of wildlife species, both migratory and non-migratory. Seney NWR is an *outlier* in the National Wildlife Refuge System (NWRS); unlike many refuges, Seney is relatively large, exists in a matrix of public lands with a low human population density, and is surrounded by native land covers (see CCP and HMP for citations). Although two major ecological processes have been altered on the refuge (namely fire and hydrology) and some structural and compositional changes have occurred, Seney is perhaps the most ecologically intact refuge in the Midwest or the eastern United States, for that matter.

The wildlife community of Seney NWR is primarily representative of those of the past, with intact predator-prey relationships. Based on the above, the Seney NWR CCP took a broad perspective on refuge management and outlined a land-ecosystem management gradient from east to west over the refuge's four management units. This gradient covers the conservation of the relatively altered Unit 1 Pool System, an emphasis on restoration of landscape processes and patterns in Units 2 and 3, and the preservation of relatively intact habitats and landscape

patterns and processes in Unit 4, the Seney Wilderness Area. Many conditions in the latter are used to guide restoration in Units 2 and 3. Habitat (land-ecosystem) management focuses on promoting the "natural range of variability" (NRV, Landres et al. 1999) of composition, structure, and disturbance within the context of the *Refuge Improvement Act* and the *Biological Integrity, Diversity, and Environmental Health Policy* (Schroeder et al. 2004; Scott et al. 2004; Meretsky et al. 2006). The values that fall outside the NRV function as the "trigger" for most actions, but these patterns need to be quantified in some instances. Consequently, most approaches will be more "coarse" and "meso-filtered", rather than "fine-filtered" (Hunter 2005) and will focus on retaining critical ecosystems and habitat types, maintaining refuge biodiversity, and maintaining or restoring (where possible) ecosystem patterns and processes (Holling and Meffe 1996) across the refuge's four management units and the associated seven ecological land units (Land type Associations, LTAs, Cleland et al. 1997). Depending on approach, the potential for novel ecosystems exists and management may wittingly or unwittingly promote them; emigration and immigration of species will also likely occur, producing more uncertainty (Hobbs *et al.* 2009). Although pool management will still be an important consideration of Seney NWR, the HMP deemphasized the management of this anthropogenic habitat.

Kirtland's Warbler WMA in the northern Lower Peninsula of Michigan was established in 1980 … to conserve (A) fish or wildlife which are listed as endangered species or threatened species.... or (B) plants ...16 U.S.C.1534 (*Endangered Species Act* of 1973). The Kirtland's Warbler WMA CCP took a disturbance ecology-based perspective on habitat management that considered the range of conditions encountered across jack pine (*Pinus banksiana*) seral states or age classes: from mature, closed-canopy forests to openland-dominated pine barrens. The HMP focused on promoting the NRV (Landres et al. 1999) within the context of the *Refuge Improvement Act* and the *Biological Integrity, Diversity, and Environmental Health Policy* (Schroeder et al. 2004; Scott et al. 2004; Meretsky et al. 2006). Studies led by (or involving) refuge staff are currently underway to fill in many existing knowledge gaps. Approaches to management are a combination of meso-filtered and fine-filtered (Hunter 2005). Although jack pine plantation management will still be an important consideration of the Kirtland's Warbler WMA, the HMP deemphasized the management of this anthropogenic habitat.

Harbor Island NWR in Lake Huron was purchased in 1983 under authority of the *Fish and Wildlife Act* of 1956 (16 U.S.C. 742a-742j) … (for the) conservation, management, and restoration of the fish, wildlife, and plant resources and their

habitats for the benefit of present and future generations of Americans…" 16 U.S.C. n 668dd(a)(2) (*National Wildlife Refuge System Administration Act*). Per the HMP, Harbor Island NWR is managed as *de facto* Wilderness.

Huron NWR in Lake Superior was established by Executive Order dated October 10, 1905 …as a Refuge and breeding ground for migratory birds and other wildlife16 U.S.C. 71 5d (*Migratory Bird Conservation Act*) conservation, management, and restoration of the fish, wildlife, and plant resources and their habitats for the benefit of present and future generations of Americans 16 U.S.C. n 668dd(a)(2) (*National Wildlife Refuge System Administration Act*). Public Law 91-504, October 23, 1970 designated Huron NWR as a Wilderness Area.

Of the nine islands within Michigan Islands NWR, the staff at Seney NWR manage Gull, Hat, Shoe, and Pismire islands in the Beaver Archipelago of northern Lake Michigan. Michigan Islands NWR was established "as a refuge and breeding ground for migratory birds and other wildlife … and for use as an inviolate sanctuary, or for any other management purpose, for migratory birds. 16 U.S.C. 715d (*Migratory Bird Conservation Act*)." The refuge also contributes to the "conservation, management, and restoration of the fish, wildlife, and plant resources and their habitats for the benefit of present and future generations of Americans… 16 U.S.C. 668dd(a)(2) (*National Wildlife Refuge System Administration Act*). Public Law 91-504, October 23, 1970 established Shoe and Pismire Islands within Michigan Islands NWR as designated Wilderness Areas. Per the HMP, all islands managed by Seney NWR are treated as *de facto* Wilderness Areas.

## Methods

Applied research, inventory, and monitoring are critical aspects of management at Seney NWR and its satellite refuges. Along with land management, applied research, and student mentoring and guiding, inventory and monitoring make up the main foci of the Applied Sciences Program. Approximately 33% of staff time is presently devoted to collecting, analyzing, and reporting inventory and monitoring data, mostly of the distribution and abundance of wildlife *Resources of Concern*. Applied research is primarily focused on describing vegetation patterns and understanding ecological processes, monitoring is focused on wildlife.

Seney NWR and satellites have an ongoing inventory of many taxa that is supplemented by research findings. Currently, most time and energy is spent on improving the refuge herbarium, including updating and digitizing the contents

into broader databases across the state and region (see Michigan Consortium of Botanists).

Seney NWR and satellites also have a long history of monitoring wildlife through the efforts of staff, interns, other students, and volunteers. Some data from certain surveys (e.g., Trumpeter Swan survey which is part of the Pool Survey) have been recently used to assess the efficacy of management efforts, while other surveys are specifically designed to be used by others to address broader conservation issues (e.g., North American Breeding Bird Survey, American Woodcock Singing Ground Survey, Sandhill Crane Surveys, etc.).

As the priorities of the refuge shift over time due to updated policies, changing populations of species, and better knowledge of the natural world, surveys have been added and dropped accordingly. For instance, during the in 1970s the Bald Eagle was an Endangered Species due to low reproductive output caused by environmental toxins. As these toxins were reduced in the environment and the protection of the bird increased, populations recovered. Although the status of this species was once monitored on the refuge, its present status is such that these efforts are no longer warranted. The same holds true for other former species of conservation concern, such as Canada Goose and other hunted species such as white-tailed deer. Seney NWR continues to improve communication with stakeholders and conservation partners to explain the rationale for our current priorities.

In 2006, Regional Office staff and Seney NWR held a Biological Review (Heglund et al. 2009; Appendix A) attended by local ecologists, biologists, etc. The Executive Summary of this document was:

> "*In this report we summarize the observations and comments made by a panel of experts brought together to conduct a Wildlife and Habitat Review for Seney National Wildlife Refuge (Seney NWR) in August of 2006 (Heglund et al. 2009). The results of this review will guide the Refuge's biological program from 2007 to 2012. Prioritizing and balancing the multitude of habitat management actions required on a refuge is always a challenge for any station. The staff at Seney have made excellent progress in prioritizing, carefully planning and executing their biological program. The Refuge staff continue to articulate and clarify their expected outcomes from a given management action before they engage in the action. Further, they typically include in their planning, a "no management" (aka, "What would happen if a management unit were left to take care of itself?") analysis as a matter of*

> *course. These practices have allowed the staff to focus on restoring hydrologic function and fire processes on the Refuge, as well as maintain wildlife populations currently breeding on or migrating through the Refuge and continuing with forest restoration. More detail is provided in the body of the report.*
>
> *"Overall, the panel was supportive of the current biological program at Seney NWR. Throughout the review, panel members stressed the need for the Refuge staff to carefully develop and finalize their biological goals and objectives, focusing, where feasible, on 1) restoring major hydrological processes that have been disrupted over time, 2) restoring natural and managed fire back into the system to promote the restoration of fire dependent forest conditions and for setting back shrub encroachment in marshes and bogs, 3) maintaining wildlife populations currently breeding on or migrating through the Refuge, 4) continue with forest restoration, with the mixed pine forest restoration the priority, 5) restoring/rehabilitating most open fields within the Refuge boundary to northern hardwood forest vegetation but maintaining Diversion Farm as an open field managed for grassland species, 6) developing a plan for water level management in Unit 1, 7) developing and following a plan to prevent, detect, eliminate and/or control the spread of invasive species in all units; and 8) continue collaborations with the IMPROVE (Interagency Monitoring of Protected Visual Environments Program, the NADP (National Atmospheric Deposition Program), and the MDN (Mercury Deposition Network)."*

Along with evaluations for the satellite refuges, the above formed the basis for the Seney NWR CCP, the HMP, and this document.

**Prioritizing and Selecting Surveys**

The priority ranking of some of the current surveys was determined during the Biological Program Review conducted at Seney NWR August 28-30, 2006 (Heglund et al. 2009; Appendix A). To prepare for the Biological Program Review, refuge staff conducted literature searches, compiled and reviewed reports and publications, and met with collaborating universities, agencies, and non-governmental entities. Thirteen professionals ranked each of the candidate surveys with three priority categories: high, medium, and low (Appendix B).

More recently, Seney NWR staff generated a list of extant and anticipated surveys. This extensive list was refined to exclude general observations (reconnaissance) of

refuge resources that do not require protocols or data management. The remaining surveys were then assigned a priority score based on the results and approach of the Biological Program Review conducted in 2006. Therefore, all current surveys were either recommended in the 2006 Biological Review, meet specific goals and objectives of the CCPs or HMPs for Seney NWR and its satellite refuges, meet other policy requirements, or facilitate cooperation with national, regional, or state conservation partners.

**Estimating Capacity**

Although monitoring is a critical aspect of science-based (evidence-based) land management, there are many limitations to its intensive or extensive application at Seney NWR and on the associated satellite refuges. First and foremost is staffing. With over 100,000 acres of land spread over islands in Lake Superior, Michigan, Huron, eight counties of the northern Lower Peninsula, and Seney NWR (plus Whitefish Point Unit) itself, the need for inventories and monitoring (I&M) exceeds the resources. One full-time staff person cannot meet all the information needs, even when utilizing students and volunteers. On nearby U.S Forest Service National Forests and U.S. Park Service National Parks, there are entire staffs devoted to monitoring, invasive plant management, other habitat (land) management, and planning to meet information needs of these public lands. Examples of large unmet information needs at Seney NWR include, but are not limited to, water budgets and effects of prescribed fire. However, tough decisions must be made and activities prioritized based on the currently available resources. Therefore, annual costs for implementing surveys were estimated considering the value of the selected surveys and staffing and budget constraints. Selecting only surveys that can be conducted with anticipated resources should lead to surveys of better quality and commitment to all components of conducting a survey (planning, administration, implementation, data analysis and archiving, reporting and feedback to management). These estimates are preliminary, as capacity changes from year to year as it is influenced by staffing and budgets. Estimated annual costs for implementing surveys are documented in Appendix C. Finally, we need to communicate our I&M priorities to help our conservation partners and the public (in general) understand Seney NWR's mission.

## Results: Selected Surveys

As part of the Biological Review, and with the completion of the CCPs and HMPs for Seney NWR and its satellites, the refuge re-evaluated its wildlife surveys to better integrate monitoring and Resources of Concern.

| Resource of Concern | Associated Habitat Type(s) | Monitoring Status |
|---|---|---|
| Kirtland's Warbler (Endangered Species) | Coniferous Forests-Upland (Jack Pine at Kirtland's Warbler WMA) | Ongoing; part of multi-agency effort led by *Kirtland's Warbler Recovery Team* |
| Piping Plover (Endangered Species) | Great Lakes shoreline (at Whitefish Point) | Ongoing; part of multi-agency effort led by Ecological Services |
| Common Loon[a] | Open Water (Anthropogenic Pools) | Ongoing; part of pool surveys, research not yet published |
| Trumpeter Swan[a] | Open Water (Anthropogenic Pools) | Ongoing; part of pool surveys, research published |
| Osprey[a] | Open Water (Anthropogenic Pools) | Ongoing; part of pool surveys, research not yet published |
| Merlin | Numerous | None |
| Northern Harrier | Open Wetlands-Upland Old Fields | Ongoing; part of pool surveys |
| American Bittern | Open Wetlands | Ongoing; part of re-established marsh bird survey (led by MNFI[b]) |
| Yellow Rail | Open Wetlands | Ongoing; part of re-established marsh bird survey (led by MNFI) |
| Le Conte's Sparrow | Open Wetlands | Ongoing; part of re-established marsh bird survey (led by MNFI) |

| Resource of Concern | Associated Habitat Type(s) | Monitoring Status |
|---|---|---|
| Sedge Wren | Open Wetlands | Ongoing; part of re-established marsh bird survey (led by MNFI) |
| Sharp-tailed Grouse[a?] | Open Wetland-Upland Old Fields | Ongoing; part of State-led effort |
| Black-backed Woodpecker | Coniferous Forests-Uplands, Lowlands | None |
| Spruce Grouse | Coniferous Forests-Uplands, Lowlands | None |
| Olive-sided Flycatcher | Coniferous Forests-Uplands, Lowlands | None |
| Whip-poor-will | Coniferous Forests-Uplands, Shrub-Scrub | Ongoing; part of MNFI-led effort |
| Wood Turtle | Open Water (Rivers) | None |
| Mink Frog[a?] | Open Water-Open Wetlands | Ongoing; part of State-led Frog-Toad Survey |
| Seney Wilderness Area | Scrub-Shrub, Open Wetlands, Coniferous Forests-Uplands, Lowlands | Research published |
| Strangmoor Bog National Natural Landmark | Scrub-Shrub, Open Wetlands, Coniferous Forests-Uplands, Lowlands | Research published, will discuss plant monitoring with MNFI |
| Strangmoor Bog RNA | Scrub-Shrub, Open Wetlands | Research published |
| Red Pine RNA | Coniferous Forests-Uplands | REA[c] plots established 2012 |
| Hemlock RNA | Coniferous Forests-Lowlands | REA plots established 2012 |
| Sugar Maple-Beech-Yellow Birch RNA | Deciduous Forests-Uplands | REA plots established 2010 |

| Resource of Concern | Associated Habitat Type(s) | Monitoring Status |
|---|---|---|
| White Pine PUNA | Coniferous Forests-Uplands | None |
| Northern Hardwoods PUNA | Deciduous Forests-Uplands | REA plots established 2010 |
| Forest ecosystems (Harbor Island NWR) | Mixed Forests-Upland | REA plots established 2014 |
| Forest ecosystems (Huron NWR) | Mixed Forests-Uplands | None; Expected |
| Lake Huron tansy (Harbor Island NWR) | Shoreline | None; Expected |
| Narrow-leaved Reed Grass (Huron NWR) | Shoreline | None; Expected |
| Colonial waterbirds (Michigan Islands NWR) | Entire island | Ongoing |

[a]Primarily dependent on anthropogenic habitat(s)
[b]Michigan Natural Features Inventory (MNFI)
[c]Rapid Ecological Assessment (REA)

Staffing limitations require the extensive use of qualified volunteers or interns, paid through Seney Natural History Association, to do much of this work. Planning in light of this is potentially problematic; refuge management programs are too dependent on a single staff member and continuity and consistency will always be a problem as long as this continues. Given the size of the refuge and the complexity of management, there is a strong need for more permanent biological staff, including biological technicians.

Prioritization was used in deliberative selection of surveys to be completed over the life of the IMP. In addition to the priority scores, the level of effort required to complete a survey as well as input from Region 3 Migratory Birds Program, Region 3 Water Resources, East Lansing Ecological Services Field Office, Audubon *Important Bird Areas* committee and Michigan Department of Natural Resources were considered in the selection process. Selected surveys include surveys identified for completion with FY2016 levels of staffing and support (Table 1). The list of surveys selected for implementation with existing resources represents a commitment to

implementation by refuge staff. Changes in available capacity, CCP objectives, HMP objectives, or other factors that alter the list of selected surveys through addition or removal of selected surveys will trigger a revision of this IMP (701 FW 2) and updates to the PRIMR database.

The process identified 28 surveys that can be completed with current staffing levels and budget for the duration of this IMP (Table 1). An estimated annual work schedule for selected surveys is shown in Appendix D, and non-selected surveys are listed in Appendix E. Survey names were updated after the ranking exercise based on national and regional lists of standardized names, available protocols and companion surveys that must be completed simultaneously to maximize value. A Refuge Condition Summary, which can be used as a reporting tool to summarize status, trends, and desired conditions of the selected surveys, is provided in Appendix F. Environmental Action Statement requirements are addressed in Appendix G.

**List of Selected Surveys and Rationale for Selection**

(Surveys are listed in order of decreasing priority)

| Name | Rationale |
|---|---|
| Annual Kirtland's Warbler Official Census: Lower and Upper Peninsulas of Michigan | This survey, for an Endangered species and led by Michigan DNR, addresses specific goals and objectives in the Kirtland's Warbler WMA CCP and HMP and addresses monitoring and conservation issues for this species at national, regional, and state scales. The survey helps to evaluate the population relative to the recovery objective and evaluate management actions. |
| Piping Plover Census | This survey, for an Endangered species and lead by East Lansing Field Office, addresses specific goals and objectives in the Seney NWR (Whitefish Point Unit) CCP and HMP and addresses monitoring and conservation issues for this species at national, regional, and state scales. The survey helps to evaluate the population relative to the recovery objective and evaluate management actions. |
| National Marsh Bird Monitoring and Research Program | This survey addresses specific goals and objectives related to wetlands and priority wildlife in the Seney NWR CCP and HMP and addresses monitoring and conservation needs at national, regional, and state scales. Contributes to the Michigan Bird Conservation Initiative state-wide survey of marsh birds. |

| Name | Rationale |
|---|---|
| Pool Surveys for Trumpeter Swan, Osprey, Common Loon Occupancy and Productivity | This survey addresses specific goals and objectives related to open water and priority wildlife in the Seney NWR CCP and HMP and addresses monitoring and conservation needs at the state scale. |
| Michigan Islands Colonial Waterbird Nest Count | This survey addresses specific goals and objectives related to colonial waterbirds in the Michigan Islands NWR CCP and HMP and meets monitoring needs at regional and state scales. |
| Forest Ecology-Restoration Research (Pattern/Process, Seney NWR-Kirtland's Warbler WMA) | This survey addresses specific goals and objectives related to the management of the forest ecosystem at Seney NWR and Kirtland's Warbler WMA CCP and HMP. Results from these studies have facilitated related restoration and conservation at regional, state, and local scales. |
| Wetland Ecology-Restoration Research (Pattern/Process, Seney NWR) | This survey addresses specific goals and objectives related to the management of wetland ecosystem at Seney NWR CCP and HMP. Results from these studies have facilitated related restoration and conservation at regional, state, and local scales. |
| Mercury Deposition Network | This survey addresses national (continental) monitoring needs and other policy requirements. |
| National Atmospheric Deposition Program | This survey addresses national (continental) monitoring needs and other policy requirements related to the Class I airshed above the Seney Wilderness Area. |
| Common Tern Survey and Reproductive Monitoring | This survey addresses specific regional and state needs for a species of conservation priority as identified by R3 Migratory Birds Program and other conservation partners. The refuge works with US Coast Guard at the St. Ignace pier to protect one of the largest Common Tern colonies in Michigan. |
| American Woodcock Singing Ground Survey | This survey addresses specific regional and state needs for a species of conservation priority as identified by R3 Migratory Birds Program and other conservation partners. |

| Name | Rationale |
|---|---|
| North American Amphibian Monitoring Program | This survey addresses specific national, regional, and state monitoring needs and is part of the state-wide Michigan Frog and Toad Survey. The refuge provides consistent monitoring in the Upper Peninsula, including detections for the under-represented mink frog. |
| Seney NWR - Wilderness Character Monitoring | This survey addresses specific goals and objectives in the Seney NWR CCP and HMP and Wilderness Area policies. |
| Michigan Islands NWR - Wilderness Character Monitoring | This survey addresses specific goals and objectives in the Michigan Islands NWR CCP and HMP and Wilderness Area policies. |
| Michigan Islands NWR - Seney portion: Periodic inspection | This survey addresses specific goals and objectives in the Michigan Islands NWR CCP and HMP. |
| Huron NWR - Wilderness Character Monitoring | This survey addresses specific goals and objectives in the Huron NWR CCP and HMP and Wilderness Area policies. |
| Huron NWR - Periodic inspection | This survey addresses specific goals and objectives in the Huron NWR CCP and HMP. |
| Harbor Island NWR - Periodic inspection | This survey addresses specific goals and objectives in the Harbor Island NWR CCP and HMP. |
| North American Breeding Bird Survey | This survey addresses specific regional and state needs for numerous bird species of conservation priority as identified by R3 Migratory Birds Program and other conservation partners. |
| Sharp-tailed Grouse Dancing Ground (Lek) Survey | This survey addresses specific regional and state needs for a species of conservation priority as identified by state conservation partners. This species is state-listed as special concern and is an area-sensitive flagship species of large openland ecosystem complexes. Michigan's Upper Peninsula is the most easterly distribution of the species in the United States. |
| Fall Sandhill Crane Count | This survey addresses specific regional and state needs for a species of conservation priority as identified by R3 Migratory Birds Program and other conservation partners. |

| Name | Rationale |
|---|---|
| International Crane Foundation Spring Crane Count | This survey addresses specific regional and state needs for a species of conservation priority as identified by R3 Migratory Birds Program and other conservation partners. |
| Ruffed Grouse Drumming Survey | This survey addresses specific state needs for a species of priority as identified by state conservation partners. As a cooperative effort with the Michigan DNR, the refuge is asked to participate in a spring drumming survey, which it has done for decades. |
| General Plant Survey and Upgrade of Refuge Plant Collection | This survey addresses specific goals and objectives in the Seney NWR CCP and HMP. |
| Historic water level data inventory and assessment | Water management in the anthropogenic pools was a priority for most of Seney NWR's history. Although pool management has been de-emphasized in recent planning documents, it is still important to organize and document the water management history. This inventory may (if funds become available) be used to test a number of hypotheses related to Resources of Concern and ecosystem function and patterns. |
| Huron NWR - Rapid ecological assessment of forest cover of Huron NWR | Forest ecosystems were identified as a Resource of Concern in the island HMP. This inventory (rapid ecological assessment) will provide some characterization of forest composition and structure of boreal forests (likely the only boreal forest in R3). A similar assessment for Harbor Island NWR was done recently. |
| Harbor Island NWR - Lake Huron tansy (*Tanacetum huronense*) inventory | Lake Huron tansy was identified as a Resource of Concern in the island HMP. This inventory will provide some characterization of the presence, distribution, and abundance on the island. |
| Huron NWR - Narrow-leaved reedgrass (*Calamagrostis stricta*) inventory | Narrow-leaved reedgrass was identified as a Resource of Concern in the island HMP. This inventory will provide some characterization of the presence, distribution, and abundance on the island. |

**Table 1. Current Surveys to be conducted at Seney NWR and satellites 2016—2031.**

| Survey Priorities [2] | Survey ID Number[3] | Survey: Name/ Type[4] | Survey Status[5] | Mgmt. Objective ID[6] | Survey Area[7] | Staff Time (FTE) [8] | Avg. Ann. Cost (OPR) [9] | Survey Timing[10] | Survey Length[11] | Survey Coord.[12] | Citation Protocol[13] | Status Protocol[14] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.01 | FF03RKIW00-003 | Annual Kirtland's Warbler Official Census: Lower and Upper Peninsulas of Michigan (CM) | Current | CCP / 1.1, 1.2 | Multiple management units | FWS: 0.01 | $250 | Early June/ Recurring - every year | 1989-Indefinite | Refuge Biologist | (none) | Initial Survey Instructions |

[2] The rank for each survey listed in order of priority (e.g., numeric, tiered, alpha-numeric, or combination of these).
[3] A unique identification number consisting of refuge code-computer assigned sequential number. Refuge code comes from the FBMS cost center identifier.
[4] Short titles for the survey name, preferably the same name used in refuge work plans. Also include the PRIMR code for survey type in parentheses. These are: Inventory (I), Cooperative Baseline Monitoring (CB), Monitoring to Inform Management (M), Cooperative Monitoring to Inform Management (CM), Research (R), and Cooperative Research (CR).
[5] Selected surveys planned for the lifespan of this IMP (i.e., Current, Expected).
[6] The management plan and objectives that justify the selected survey.
[7] Refuge management unit names, entire refuge, or names of other landscape units included in survey.
[8] Estimates of Service (FWS) and non-Service (Other) staff time needed to complete the survey (1 work year = 2080 hours = 1 FTE).
[9] Estimates of average annual operations cost for conducting the survey during the years it is conducted (e.g., equipment, contracts, travel) but not including staff time.
[10] Timing and frequency of survey field activities.
[11] The years during which the survey is conducted.
[12] The name and position of the survey coordinator (the Refuge Biologist or other designated Service employee) for each survey.
[13] Title, author, and version of the survey protocol (if there is no protocol to cite, enter None).
[14] Scale of intended use (Site-specific, Regional, or National) and stage of approval (Initial Survey Instructions, Complete Draft, In Review, or Approved) of the survey protocol.

| Survey Priorities [2] | Survey ID Number[3] | Survey: Name/ Type[4] | Survey Status[5] | Mgmt. Objective ID[6] | Survey Area[7] | Staff Time (FTE) [8] | Avg. Ann. Cost (OPR) [9] | Survey Timing[10] | Survey Length[11] | Survey Coord.[12] | Citation Protocol[13] | Status Protocol[14] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.01 | FF03RSNY00-026 | Piping Plover Census (CM) | Current | CCP / 1.1, 1.2, 3.7 | Single management unit | FWS: 0.01 | $200 | April - July/ Recurring - every year | 1988- Indefinite | Assistant Manager | (none) | Initial Survey Instructions |
| 1.02 | FF03RSNY00-023 | National Marsh Bird Monitoring and Research Program (CB) | Current | HMP / Page 27, 28, 34 | Multiple management units | FWS: 0.03, Other: 0.01 | $300 | May - June/ Recurring - every year | 2004 - Indefinite | Refuge Biologist | (none) | Initial Survey Instructions |
| 1.03 | FF03RSNY00-027 | Pool Surveys for Trumpeter Swan, Osprey, Common Loon Occupancy and Productivity (M) | Current | HMP / Page 34 | Multiple management units | FWS: 0.0, Other: 0.03 | $0 | May - October/ Recurring - every year | 1991 - Indefinite | Refuge Biologist | (none) | Initial Survey Instructions |
| 1.04 | FF03RMCH00-004 | Michigan Islands Colonial Waterbird Nest Count (CB) | Current | HMP / Objective 1, 2, 3 | Multiple management units | FWS: 0.01, Other: 0.0 | $500 | May - June/ Recurring - every year | 1997 - Indefinite | Refuge Biologist | (none) | Initial Survey Instructions |

| Survey Priorities [2] | Survey ID Number[3] | Survey: Name/ Type[4] | Survey Status[5] | Mgmt. Objective ID[6] | Survey Area[7] | Staff Time (FTE) [8] | Avg. Ann. Cost (OPR) [9] | Survey Timing[10] | Survey Length[11] | Survey Coord.[12] | Citation Protocol[13] | Status Protocol[14] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.05 | FF03RSNY00-022 | Forest Ecology-Restoration Research (Pattern/Process, Seney NWR-Kirtland's Warbler WMA) (CR) | Current | CCP / 1.2 | Entire station | FWS: 0.02 | $0 | Recurring - every year | 2006 - Indefinite | Refuge Biologist | (none) | Initial Survey Instructions |
| 1.05 | FF03RSNY00-074 | Wetland Ecology-Restoration Research (Pattern/Process, Seney NWR) (CR) | Current | HMP / Page 27, 28, 34 | Entire Station | FWS: 0.04 | $0 | Recurring - every year | 2006- Indefinite | Refuge Biologist | (none) | Initial Survey Instructions |
| 1.06 | FF03RSNY00-024 | Mercury Deposition Network (CM) | Current | CCP / 1.2 | Entire station | N/A | $2,510 | Weekly/ Recurring - every year | 1999 - Indefinite | Assistant Manager | (none) | Initial Survey Instructions |
| 1.06 | FF03RSNY00-012 | National Atmospheric Deposition Program (CB) | Current | CCP / 1.2 | Entire station | N/A | $2,510 | Weekly/ Recurring - every year | 2001 - Indefinite | Assistant Manager | (none) | Initial Survey Instructions |
| 1.07 | FF03RSNY00-029 | Common Tern Survey and Reproductive Monitoring (M) | Current | CCP / 1.1, 1.2 | Single management unit | FWS: 0.02 | $400 | May - Aug/ Recurring - every year | 2001 - Indefinite | Refuge Biologist | (none) | Initial Survey Instructions |

| Survey Priorities [2] | Survey ID Number[3] | Survey: Name/ Type[4] | Survey Status[5] | Mgmt. Objective ID[6] | Survey Area[7] | Staff Time (FTE) [8] | Avg. Ann. Cost (OPR) [9] | Survey Timing[10] | Survey Length[11] | Survey Coord.[12] | Citation Protocol[13] | Status Protocol[14] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.08 | FF03RSNY00-021 | American Woodcock Singing Ground Survey (CB) | Current | CCP / 1.1, 1.2 | Multiple management units | FWS: 0.0 | $25 | May/ Recurring - every year | 1965 - Indefinite | Refuge Biologist | (none) | Initial Survey Instructions |
| 1.09 | FF03RSNY00-005 | North American Amphibian Monitoring Program (CB) | Current | HMP / Page 28, 34 | Single management unit | FWS: 0.01, Other: 0.01 | $30 | May - July/ Recurring - every year | 1988 - Indefinite | Refuge Biologist | (none) | Initial Survey Instructions |
| 1.10 | FF03RSNY00-068 | Seney NWR - Wilderness Character Monitoring (BM) | Current | CCP / 1.1 | Multiple management units | FWS: 0.01 | $0 | Recurring - every year | 2011 - Indefinite | Refuge Manager | (none) | Initial Survey Instructions |
| 1.10 | FF03RMCH00-008 | Michigan Islands NWR - Wilderness Character Monitoring (BM) | Current | HMP / Objective 1 | (none) | FWS: 0.01, Other: 0.0 | $500 | Recurring - every year | 2015 - Indefinite | Refuge Manager | (none) | Initial Survey Instructions |
| 1.10 | FF03RMCH00-007 | Michigan Islands NWR - Seney portion: Periodic inspection (BM) | Current | HMP / Objective 1 | Entire station | FWS: 0.01, Other: 0.0 | $500 | Recurring - every year | 1980 - Indefinite | Refuge Biologist | (none) | Initial Survey Instructions |
| 1.10 | FF03RHRN00-006 | Huron NWR - Wilderness Character Monitoring (BM) | Current | HMP / Objective 1 | Multiple management units | FWS: 0.01, Other: 0.0 | $500 | Recurring - every year | 2013- Indefinite | Refuge Manager | (none) | Initial Survey Instructions |

| Survey Priorities [2] | Survey ID Number[3] | Survey: Name/ Type[4] | Survey Status[5] | Mgmt. Objective ID[6] | Survey Area[7] | Staff Time (FTE) [8] | Avg. Ann. Cost (OPR) [9] | Survey Timing[10] | Survey Length[11] | Survey Coord.[12] | Citation Protocol[13] | Status Protocol[14] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.10 | FF03RHRN00-002 | Huron NWR - Periodic inspection. (BM) | Current | HMP / Objective 1 | Entire station | FWS: 0.01, Other: 0.0 | $500 | Recurring - every year | 1905 - Indefinite | Refuge Biologist | (none) | Initial Survey Instructions |
| 1.10 | FF03RHBR00-002 | Harbor Island NWR - Periodic inspection. (BM) | Current | HMP / Objective 1 | Entire station | FWS: 0.01, Other: 0.0 | $500 | Recurring - every year | 1983 - Indefinite | Refuge Biologist | (none) | Initial Survey Instructions |
| 1.11 | FF03RSNY00-014 | North American Breeding Bird Survey (CB) | Current | HMP / Page 29, 30, 32, 33, 35, 39 | Multiple management units | FWS: 0.0, Other: 0.0 | $50 | June – July/ Recurring - every year | 1992 - Indefinite | Refuge Biologist | (none) | Initial Survey Instructions |
| 1.12 | FF03RSNY00-013 | Sharp-tailed Grouse Dancing Ground (Lek) Survey (CM) | Current | HMP / Page 28, 39 | Single management unit | FWS: 0.01 | $0 | April - May/ Recurring - every year | 1939 - Indefinite | Refuge Biologist | (none) | Initial Survey Instructions |
| 1.13 | FF03RSNY00-008 | Fall Sandhill Crane Count (CB) | Current | HMP / Page 28 | Multiple management units | FWS: 0.01 | $100 | Sept – Oct/ Recurring - every year | 1982 - Indefinite | Refuge Biologist | (none) | Initial Survey Instructions |
| 1.13 | FF03RSNY00-018 | International Crane Foundation Spring Crane Count (CB) | Current | HMP / Page 28 | Multiple management units | FWS: 0.0, Other: 0.0 | $100 | April – May/ Recurring - every year | 1982 - Indefinite | Refuge Biologist | (none) | Initial Survey Instructions |
| 1.15 | FF03RSNY00-017 | Ruffed Grouse Drumming Survey (CB) | Current | CCP / 1.2 | Multiple management units | FWS: 0.0 | $50 | April - May/ Recurring - every year | 1991 - Indefinite | Refuge Biologist | (none) | Initial Survey Instructions |

| Survey Priorities [2] | Survey ID Number[3] | Survey: Name/ Type[4] | Survey Status[5] | Mgmt. Objective ID[6] | Survey Area[7] | Staff Time (FTE) [8] | Avg. Ann. Cost (OPR) [9] | Survey Timing[10] | Survey Length[11] | Survey Coord.[12] | Citation Protocol[13] | Status Protocol[14] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.16 | FF03RSNY00-060 | General Plant Survey and Upgrade of Refuge Plant Collection (BM) | Current | CCP / 1.2 | Entire station | FWS: 0.0 | $0 | May - Sept / Sporadic or Ad Hoc | 1940 - Indefinite | Refuge Biologist | (none) | Initial Survey Instructions |
| 2.01 | FF03RSNY00-015 | Historic water level data inventory and assessment | Expected | HMP / Page 34 | Multiple management units | FWS: 0.02 | $0 | Mar – Dec / Occurs one time only | 2017 - 2017 | Refuge Biologist | (none) | Initial Survey Instructions |
| 2.02 | FF03RHRN00-005 | Huron NWR - Rapid ecological assessment of forest cover of Huron NWR | Expected | HMP / Objective 2 | Single management unit | FWS: 0.02 | $500 | July – Sept / Occurs one time only | 2017 - 2017 | Refuge Biologist | Corace and Petrillo 2014 | Regional Approved |
| 2.03 | FF03RHBR00-008 | Harbor Island NWR - Lake Huron tansy (*Tanacetum huronense*) inventory | Expected | HMP / Objective 2 | Entire station | FWS: 0.02 | $500 | Occurs one time only | 2017 - 2017 | Refuge Biologist | (none) | Initial Survey Instructions |
| 2.04 | FF03RHRN00-007 | Huron NWR - Narrow-leaved reedgrass (*Calamagrostis stricta*) inventory | Expected | HMP / Objective 1 | Entire station | FWS: 0.02 | $500 | Occurs one time only | 2017 - 2017 | Refuge Biologist | (none) | Initial Survey Instructions |

## Narratives for Selected Surveys

**Survey: *Annual Kirtland's Warbler Official Census: Lower and Upper Peninsulas of Michigan***

*(FF03RKIW00-003)*

**Refuge**
Kirtland's Warbler Wildlife Management Area

**Priority**
1.01

**Which station management objective does the survey support?**
Is the objective derived from the CCP, interim objectives, HMP, or other?

CCP: Continue to be an active partner in the Kirtland's Warbler *(Setophaga kirtlandii)* recovery effort; implement a monitoring program to track the presence, abundance, population trends, and habitat associations of Trust Resources and determine ways to emulate natural species diversity.

**Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.**
The management program for the Endangered Kirtland's Warbler is carried out under the direction of the Kirtland's Warbler Recovery Team. One component of the Recovery Plan is to, "monitor breeding populations...in order to evaluate responses to management practices and environmental changes." The singing male census (survey) protocol is a critical component of the monitoring program. Overall coordination of this monitoring program has been delegated from the Recovery Team to the Wildlife Division, Michigan Department of Natural Resources, with significant involvement by the U.S. Forest Service. Seney NWR is also a cooperator in the monitoring program and usually works on finding singing male warblers in the eastern Upper Peninsula. Procedures and reporting forms change slightly from year to year and refuge staff should consult with the Recovery Team before conducting the survey.

The Kirtland's Warbler spring census is a tool that enables managers to:

1) evaluate the Warbler population relative to the recovery objective (1,000 singing males for five consecutive years);

2) determine the presence or absence of individuals in areas for protection purposes;

3) evaluate habitat management activities (for example, plantation vs. trench and seed);

4) detect differences in occupancy, duration of use, and density of singing males between management areas;

5) build public confidence in Endangered species management;

6) provide data for research.

**What is the population or attribute of interest, what will be measured, and when?**
Biological Integrity; At-risk Biota; Aves (Birds); Passeriformes (Perching Birds); *Setophaga kirtlandii* (= *Dendroica kirtlandii*) (Kirtland's Warbler) - E- Entire; Recurring -- every year; The census is done over an approximate 10-day period in early June of each year.

**Is this a cooperative survey? If so, what partners are involved in the survey?**
Coop Monitoring to Inform Management; Michigan Department of Natural Resources, United States Forest Service, Huron Pines, and the Michigan Department of Military Affairs.

**Survey: *Piping Plover Census***

(FF03RSNY00-026)

**Refuge**
Seney National Wildlife Refuge

**Priority**
1.01

**Which station management objective does the survey support?**
Is the objective derived from the CCP, interim objectives, HMP, or other?

CCP: Trust Resources; Whitefish Point Unit; Wildlife, Habitat, Community, and Ecosystem Research.

**Why is it important to conduct the survey?**
Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.

The management program for the Endangered Great Lakes population of Piping Plover (the northern Great Plains and Atlantic Coast populations are considered threatened) is carried out under the direction of the Recovery Plan for the Great Lakes Piping Plover (*Charadrius melodus*). Parts of the recovery strategy include, "to increase average fecundity, protect essential breeding habitat, increase public education and outreach, and establish and maintain partnerships" (USFWS 2003). The Great Lakes population of the Piping Plover was listed as an Endangered species in 1985 (USFWS 2003) and is also listed by the State of Michigan as a state endangered species. Overall coordination for annual nest monitoring is led by the East Lansing Ecological Services Field Office, with Vincent Cavalieri the current coordinator. Seney NWR is a cooperator in the annual monitoring program, primarily up at its Whitefish Point Unit, north of Paradise, Michigan along Lake Superior. Approximately ¼ mi of shoreline at the Whitefish Point Unit is designated as critical habitat for piping plovers (USFWS 2001).

Prior to the recent past, the last known Piping Plover nesting attempt at Whitefish Point was in 1985 (Michigan Land Use Institute 2002). In 2009, a pair successfully nested and fledged four young. In 2010 and 2011, a single pair nested each year with

three young successfully fledged each year. In 2012, three pairs nested and 11 young were successfully fledged.

The annual monitoring program is primarily composed of three main stages:

1. Search available nesting habitat and attempt to find Piping Plover and/or nests;

2. Set up predator exclosures around nests and daily monitoring of nests until hatching;

3. Band plovers, chicks plus adults if not already banded, and daily monitoring of plovers until all chicks have died or fledged.

The 2003 Great Lakes Recovery Plan describe four recovery criteria that must be met before the population will be considered for reclassification to threatened status (USFWS 2009):

1. The population has increased to at least 150 pairs (300 individuals), for at least 5 consecutive years, with at least 100 breeding pairs (200 individuals) in Michigan and 50 breeding pairs (100 individuals) distributed among sites in other Great Lake States;

2. 5-year average fecundity is within the range of 1.5 – 2.0 fledglings per pair, per year across the breeding distribution, and ten-year population projections indicate the population is stable or continuing to grow above the recovery goal;

3. Ensure protection and long-term maintenance of essential breeding habitat in the Great Lakes and wintering habitat sufficient in quantity, quality and distribution to support the recovery goal of 150 pairs;

4. Genetic diversity within the population is deemed adequate for population persistence and can be maintained over the long-term.

In 2012, a total of 58 nesting pairs were documented in the Great Lakes.

**What is the population or attribute of interest, what will be measured, and when?** Biological Integrity; At-risk Biota; *Charadrius melodus* (Piping Plover) - E- Great Lakes watershed; Recurring -- every year; Mid-April through July

**Is this a cooperative survey? If so, what partners are involved in the survey?**
Coop Monitoring to Inform Management; University of Minnesota; U.S. Department of Agriculture; State Agencies; In Michigan the annual monitoring program is a cooperative effort involving personnel from the USFWS, Michigan Department of Natural Resources, U.S. Park Service, U.S. Forest Service, Michigan Audubon Society, U.P. Land Conservancy, Detroit Zoo, University of Minnesota, Lake Superior State University, Central Michigan University and volunteers.

**Survey: *National Marsh Bird Monitoring and Research Program***

*(FF03RSNY00-023)*

**Refuge**
Seney National Wildlife Refuge

**Priority**
1.02

**Which station management objective does the survey support?**
Is the objective derived from the CCP, interim objectives, HMP, or other?

HMP: Open Water; Open Wetlands; Scrub-Shrub; Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.

The amount of emergent wetland habitat in North America has decreased sharply during the past century and populations of many marsh-dependent birds such as rails, bitterns, and grebes appear to be declining. Some species, including Yellow Rail, American Bittern and others, are of particular concern and have received special status through various federal and state agencies. In Michigan, Seney NWR is an Important Bird Area for a number of these species which receive Resources of Concern status in the HMP: American Bittern, Yellow Rail, Le Conte's Sparrow, and Sedge Wren.

In 2009, members of the Michigan Bird Conservation Initiative (MiBCI) began working with other State, regional, and National partners to develop a marsh bird survey in Michigan. The USFWS provided funding for a three-year effort to implement the National Marsh Bird Monitoring Program in Michigan in 2010. Goals were to 1) evaluate population trends for marsh bird species, 2) improve our understanding of marsh bird distribution and abundance, and 3) inform conservation decision-making at multiple geographic scales. Michigan's survey will provide data for an ongoing national pilot program. This pilot program is providing an opportunity to evaluate the sample design and methods of the national program, before it is expanded to a nationwide survey. We plan to continue this survey annually to allow long-term monitoring of marsh birds at the State, regional, and national levels.

Seney NWR participated in the national Secretive Marsh Bird Survey program, starting in the mid-2000s. Surveys were reinitiated based on the Michigan initiative in 2012.

**What is the population or attribute of interest, what will be measured, and when?** Biological Integrity; At-risk Biota; *Cistothorus platensis* (Sedge Wren); *Coturnicops noveboracensis* (Yellow Rail); *Melospiza georgiana* (Swamp Sparrow); *Ammodramus leconteii* (Le Conte's Sparrow); *Ixobrychus exilis* (Least Bittern); *Porzana carolina* (Sora); *Fulica americana* (American Coot); *Cistothorus palustris* (Marsh Wren); *Gallinago gallinago* (Common Snipe); Rallus limicola (Virginia Rail); *Podilymbus podiceps* (Pied-billed Grebe); *Chlidonias niger* (Black Tern); *Grus canadensis* (Sandhill Crane); *Botaurus lentiginosus* (American Bittern); Recurring -- every year; 3 surveys done between 1 May and 15 June

**Is this a cooperative survey? If so, what partners are involved in the survey?** Coop Baseline Monitoring; Michigan Natural Features Inventory.

**Survey: *Pool Surveys for Trumpeter Swan, Osprey, Common Loon Occupancy and Productivity***

(FF03RSNY00-027)

**Refuge**
Seney National Wildlife Refuge

**Priority**
1.03

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
HMP: Open Water.

**Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.**
The species below are the Resources of Concern associated with the anthropogenic pools system at the refuge and are Michigan IBA species associated with the same. The refuge has data on Trumpeter Swan since their introduction at the refuge in 1991 (Corace et al. 2006) and has long- term data (1992-present) on Osprey and Common Loon (1987-present; McCormick et al. 2007; Tischler et al. 2011) as well. The objective of this survey is to maintain these long-term data sets so as to monitor the trends of these Resources of Concern over time.

**What is the population or attribute of interest, what will be measured, and when?**
Biological Integrity; Other Biota; Gavia immer (Common Loon, Great Northern Diver, Great Northern Loon); Pandion haliaetus (Osprey, Western Osprey); Cygnus buccinator (Trumpeter Swan); Circus cyaneus (Northern Harrier); Recurring -- every year; Bi-Weekly

**Is this a cooperative survey? If so, what partners are involved in the survey?**
No

**Survey: *Michigan Islands Colonial Waterbird Nest Count***

*(FF03RMCH00-004)*

**Refuge**
Michigan Islands National Wildlife Refuge

**Priority**
1.04

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
HMP: Applied Research; Inventory and Monitoring; Protect Waterbird Colonies; Colonial waterbirds are the main management priority for Michigan Islands NWR.

**Why is it important to conduct the survey?**
Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.

For many of the islands included in the Michigan Islands NWR (both in Lake Huron and Lake Superior) colonial waterbirds comprise Resources of Concern. Herring Gulls (*Larus argentatus*) and Ring-billed Gulls (*Larus delawarensis*) Great Blue Herons (*Ardea herodias*), Black-crowned Night-herons (*Nycticorax nycticorax*), Caspian Terns (*Hydroprogne caspia*) and Double-crested Cormorants (*Phalacrocorax auritus*) are counted late May to early June.

Nests considered to be occupied are counted. These are defined as nests with eggs and/or chicks, or any nest that shows evidence of use (such as fresh vegetation or new construction) during the current season. Ground nests are counted and marked using a spray paint mark put next to the nest and counted using "clickers" for each nest.

**What is the population or attribute of interest, what will be measured, and when?**
Biological Integrity; At-risk Biota; Aves (Birds); *Suliformes* (Cormorants); *Pelecaniformes* (Ibises, Pelicans, Herons); *Charadriiformes* (Plovers, Gulls, Oystercatchers, Auks, Alcids, Shore Birds); *Larus smithsonianus* (American Herring Gull); *Phalacrocorax auritus* (Double-crested Cormorant); *Larus delawarensis* (Ring-billed Gull); *Nycticorax nycticorax* (Black-crowned Night Heron, Black-crowned

Night-Heron); *Hydroprogne caspia* (Caspian Tern); *Sterna hirundo* (Common Tern); *Ardea herodias* (Great Blue Heron); Recurring -- every year; May through June

**Is this a cooperative survey? If so, what partners are involved in the survey?**
Coop Baseline Monitoring; Academia; U.S. Fish and Wildlife Service, Migratory Birds University of Minnesota; University of Minnesota, Dr. Francesca Cuthbert, Coordinates Great Lakes Colonial Waterbird Survey: Central Michigan University, Dr. Nancy Seefelt.

**Survey: *Forest Ecology-Restoration Research (Pattern/Process, Seney NWR-Kirtland's Warbler WMA)***

(FF03RSNY00-022)

**Refuge**
Seney National Wildlife Refuge

**Priority**
1.05

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
CCP: Wildlife, Habitat, Community, and Ecosystem Research; Restoration of fire and mixed-pine forests are emphasized in CCP and HMP

**Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.**
Per the 1997 Refuge Improvement Act and the 2001 Biological Integrity and Environmental Health policy, managers are asked to consider restoration of historic condition and the natural workings of ecosystems and habitats in the planning process and (where possible) in their conservation and restoration activities. Moreover, under the Strategic Habitat Conservation (SHC) model, knowledge about how native ecosystems form and function is a critical aspect. For forest ecosystems found on Seney NWR lands, research on forest ecology and restoration has been used during the HMP process and in subsequent management. Many other important questions still exist, however. Research also has been shown to have application across other agencies and ownerships in the Upper Midwest.

**What is the population or attribute of interest, what will be measured, and when?**
Landscapes (Ecosystem Pattern and Processes); Landscape Dynamics; Recurring -- every year;

**Is this a cooperative survey? If so, what partners are involved in the survey?**
Coop Research; Academia; The Ohio State University; Wayne State University; Lake States Fire Science Consortium.

**Survey: *Wetland Ecology-Restoration Research (Pattern-Process)***

(FF03RSNY00-074)

**Refuge**
Seney National Wildlife Refuge

**Priority**
1.05

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
HMP: Open Water; Open Wetlands; Scrub-Shrub;

**Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.**
Per the 1997 Refuge Improvement Act and the 2001 Biological Integrity and Environmental Health policy, managers are asked to consider restoration of historic condition and the natural working of ecosystems and habitats in the planning process and (where possible) in their conservation and restoration activities. Moreover, under the Strategic Habitat Conservation (SHC) model, knowledge about how native ecosystems form and function is a critical aspect. For wetland ecosystems found on Seney NWR lands, research on ecology and restoration has been used during the HMP process and in subsequent management. Many other important questions still exist, however. Research also has been shown to have application across other agencies and ownerships in the Upper Midwest.

**What is the population or attribute of interest, what will be measured, and when?**
Landscapes (Ecosystem Pattern and Processes); Landscape Dynamics; Recurring -- every year;

**Is this a cooperative survey? If so, what partners are involved in the survey?**
Coop Research; Michigan Natural Features Inventory; Michigan Technological University

**Survey: *Mercury Deposition Network***

(FF03RSNY00-024)

**Refuge**
Seney National Wildlife Refuge

**Priority**
1.06

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
CCP: Wildlife, Habitat, Community, and Ecosystem Research;

**Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.**
The USFWS has legal responsibility for the protection, preservation, and enhancement of "trust" resources. Trust resources include Service lands and associated biota. Many of the Service's trust resources are currently or have the potential to be impacted by air pollutants. The Air Quality Branch, Division of Refuges and Wildlife is responsible for coordinating the management of air resources in all areas administered by the Service. Of particular importance is the management of air quality in Mandatory Class I wilderness areas as designated in the Clean Air Act (CCA) (USFWS 1982).

The Clean Air Act Amendments of 1977 provides guidance for protecting air quality. Of particular importance to the Service is the Prevention of Significant Deterioration (PSD) program outlined in sections 160 – 169. Among the purposes of the PSD program are (USFWS 1982):

> "*to preserve, protect, and enhance the air quality in national parks, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic, or historic value.*"
>
> "*to assure that any decision to permit increased air pollution in any area to which this section applies is made only after careful evaluation of all the consequences of such a decision and after adequate procedural opportunities for informed public participation in the decision making process.*"

In 1985, the IMPROVE (Interagency Monitoring of Protected Visual Environments) visibility monitoring program was initiated. IMPROVE is a cooperative program of the National Park Service, U.S. Forest Service, Bureau of Land Management, USFWS, Environmental Protection Agency and state and tribal organizations. IMPROVE was established to aid the creation of Federal and State implementation plans for the protection of visibility in Class I areas as stipulated in the 1977 amendments to the Clean Air Act (Crocker Nuclear Laboratory).

On July 1, 1999, a Final Rule (Vol. 64, No. 126) of the Environmental Protection Agency (EPA) was published and implemented concerning Regional Haze Regulations, 40 CFR Part 51. The final rule formed Regional Planning Organizations (RPO) to oversee implementation of these regulations. The final rule established a schedule setting forth deadlines by which the States must submit their first regional haze State Implementation Plans (SIP) and subsequent revisions to the first SIP. The rule also included a requirement for each state to develop a monitoring strategy.

States area also required to make data from these monitoring sites available to the EPA and other agencies. (64 FR 35743) (EPA).

The 1999 Final Rule (64 FR 35715) (EPA) defined regional haze as a visibility impairment that is produced by a multitude of sources and activities which emit fine particles and their precursors and which are located across a broad geographic area. The fine particulate matter (e.g., sulfates, nitrates, organic carbon, elemental carbon and soil dust) that impairs visibility by scattering and absorbing light can cause serious health effects and mortality in humans and contribute to environmental effects such as acid deposition and eutrophication.

In the 1999 Final Rule (64 FR 35714) (USFWS) under regional haze regulations it noted, “Section 169A of the Clean Air Act sets forth a national goal for visibility which is the “prevention of any future, and the remedying of any existing impairment of visibility in Class I areas which impairment results from manmade air pollution”. Seney National Wildlife Refuge is one of two Class I areas in the Midwest RPO with Isle Royale National Park being the other.

The 1992 USFWS “Draft Air Quality Monitoring Strategy” included the following:

> *“The goal of the Service’s air quality management strategy is to ensure that air quality and related data are collected and analyzed in a manner that*

> *which provide Air Quality Branch, regional and refuge personnel with the information necessary to effectively protect Class I wilderness and meet legal requirements.*"
>
> "*These plans will include the acquisition of data that will support the Prevention of Significant Deteriorations (PSD) permit review process and that can be used to determine trends in ecosystem components as related to air pollution impacts.*"

At Seney NWR the first step in this process was a Property Access Agreement between the Michigan Department of Environmental Quality (DEQ) and Seney NWR dated October 1998 for the installation of air monitoring equipment. "Federal Law requires the State of Michigan to create and maintain a network to provide air quality monitoring" (Michigan Department of Environmental Quality 1998). The refuge area set aside for the placement of equipment consists of less than one acre just past and to the west of Quarters #1 and surrounded by F Pool.

Air pollution monitoring began in December 1999 when an IMPROVE station was established. The purposes of the monitoring were to (Michigan Department of Environmental Quality 2002):

- establish current visibility and aerosol conditions in mandatory Class I areas;
- identify chemical species and emission sources responsible for existing man-made visibility impairment;
- document long-term trends for assessing progress toward the national visibility goal; and
- provide regional haze monitoring representing all visibility-protected federal Class I areas.

**MANAGEMENT ACTION THRESHOLDS**

Memorandum of Agreements concerning ambient air monitoring at Seney NWR were signed in 2001, 2004 and 2006 between the Lake Michigan Air Directors Consortium acting on behalf of the Midwest Regional Planning Organization, the Michigan DEQ and the USFWS through Seney NWR.

The purpose of the air monitoring program at Seney NWR is as a member of the continental network of sites monitoring air/precipitation chemistry and pollutants for monitoring of geographical and temporal long-term trends at both a continental and local scale. Also to provide data to decision makers when entities are requesting a permit through the States for new or expanded air emission source permits where the emissions could fall over or impact the Seney Class I airshed which would trigger a PSD review. This last occurred with a permit request in 2009.

**What is the population or attribute of interest, what will be measured, and when?**
Air and Climate; Air Quality; Recurring -- every year; Weekly

**Is this a cooperative survey? If so, what partners are involved in the survey?**
Coop Monitoring to Inform Management; Michigan Department of Environmental Quality

**Survey: *National Atmospheric Deposition Program***

(FF03RSNY00-012)

**Refuge**
Seney National Wildlife Refuge

**Priority**
1.06

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
CCP: Wildlife, Habitat, Community, and Ecosystem Research;

**Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.**
The USFWS has legal responsibility for the protection, preservation, and enhancement of "trust" resources. Trust resources include Service lands and associated biota. Many of the Service's trust resources are currently or have the potential to be impacted by air pollutants. The Air Quality Branch, Division of Refuges and Wildlife is responsible for coordinating the management of air resources in all areas administered by the Service. Of particular importance is the management of air quality in Mandatory Class I wilderness areas as designated in the Clean Air Act (CCA) (USFWS 1982).

The Clean Air Act Amendments of 1977 provides guidance for protecting air quality. Of particular importance to the Service is the Prevention of Significant Deterioration (PSD) program outlined in sections 160 – 169. Among the purposes of the PSD program are (USFWS 1982):

> "*to preserve, protect, and enhance the air quality in national parks, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic, or historic value.*"
>
> "*to assure that any decision to permit increased air pollution in any area to which this section applies is made only after careful evaluation of all the consequences of such a decision and after adequate procedural opportunities for informed public participation in the decision making process.*"

In 1985, the IMPROVE (Interagency Monitoring of Protected Visual Environments) visibility monitoring program was initiated. IMPROVE is a cooperative program of the National Park Service, U.S. Forest Service, Bureau of Land Management, USFWS, Environmental Protection Agency and state and tribal organizations. IMPROVE was established to aid the creation of Federal and State implementation plans for the protection of visibility in Class I areas as stipulated in the 1977 amendments to the Clean Air Act (Crocker Nuclear Laboratory).

On July 1, 1999, a Final Rule (Vol. 64, No. 126) of the Environmental Protection Agency (EPA) was published and implemented concerning Regional Haze Regulations, 40 CFR Part 51. The final rule formed Regional Planning Organizations (RPO) to oversee implementation of these regulations. The final rule established a schedule setting forth deadlines by which the States must submit their first regional haze State Implementation Plans (SIP) and subsequent revisions to the first SIP. The rule also included a requirement for each state to develop a monitoring strategy.

States area also required to make data from these monitoring sites available to the EPA and other agencies. (64 FR 35743) (EPA).

The 1999 Final Rule (64 FR 35715) (EPA) defined regional haze as a visibility impairment that is produced by a multitude of sources and activities which emit fine particles and their precursors and which are located across a broad geographic area. The fine particulate matter (e.g., sulfates, nitrates, organic carbon, elemental carbon and soil dust) that impairs visibility by scattering and absorbing light can cause serious health effects and mortality in humans and contribute to environmental effects such as acid deposition and eutrophication.

In the 1999 Final Rule (64 FR 35714) (USFWS) under regional haze regulations it noted, “Section 169A of the Clean Air Act sets forth a national goal for visibility which is the “prevention of any future, and the remedying of any existing impairment of visibility in Class I areas which impairment results from manmade air pollution”. Seney National Wildlife Refuge is one of two Class I areas in the Midwest RPO with Isle Royale National Park being the other.

The 1992 USFWS “Draft Air Quality Monitoring Strategy” included the following:

> “*The goal of the Service’s air quality management strategy is to ensure that air quality and related data are collected and analyzed in a manner that which provide Air Quality Branch, regional and refuge personnel with the*

> *information necessary to effectively protect Class I wilderness and meet legal requirements.*"
>
> "*These plans will include the acquisition of data that will support the Prevention of Significant Deteriorations (PSD) permit review process and that can be used to determine trends in ecosystem components as related to air pollution impacts.*"

At Seney NWR the first step in this process was a Property Access Agreement between the Michigan Department of Environmental Quality (DEQ) and Seney NWR dated October 1998 for the installation of air monitoring equipment. "Federal Law requires the State of Michigan to create and maintain a network to provide air quality monitoring" (Michigan Department of Environmental Quality 1998). The refuge area set aside for the placement of equipment consists of less than one acre just past and to the west of Quarters #1 and surrounded by F Pool.

Air pollution monitoring began in December 1999 when an IMPROVE station was established. The purposes of the monitoring were to (Michigan Department of Environmental Quality 2002):

- establish current visibility and aerosol conditions in mandatory Class I areas;
- identify chemical species and emission sources responsible for existing man-made visibility impairment;
- document long-term trends for assessing progress toward the national visibility goal; and
- provide regional haze monitoring representing all visibility-protected federal Class I areas.

**MANAGEMENT ACTION THRESHOLDS**

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The purpose of the air monitoring program at Seney NWR is as a member of the continental network of sites monitoring air/precipitation chemistry and pollutants for monitoring of geographical and temporal long-term trends at both a continental

and local scale. Also to provide data to decision makers when entities are requesting a permit through the States for new or expanded air emission source permits where the emissions could fall over or impact the Seney Class I airshed which would trigger a PSD review. This last occurred with a permit request in 2009.

**What is the population or attribute of interest, what will be measured, and when?**
Air and Climate; Air Quality; Recurring -- every year; weekly

**Is this a cooperative survey? If so, what partners are involved in the survey?**
Coop Baseline Monitoring; Michigan Department of Environmental Quality

**Survey: *Common Tern Survey and Reproductive Monitoring***

*(FF03RSNY00-029)*

**Refuge**
Seney National Wildlife Refuge

**Priority**
1.07

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
CCP: Trust Resources; Wildlife, Habitat, Community, and Ecosystem Research;

**Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.**
The Common Tern *(Sterna hirundo)* is a circumpolar colonial waterbird that in North America breeds in coastal areas of the northern United States and Canada. In the Midwest, the Common Tern is listed as a Conservation Priority due to habitat loss (and competition for habitat), predation, and pollution. Within the Great Lakes region, competition with Ring-billed Gulls for breeding habitat is a major influence on Common Tern numbers. Habitat loss is also a result of increased human development along shorelines and on islands. In addition, human disturbance (such as loud noises) near a colony can cause adults to abandon their nests and the colony.

Predators are also a threat to Common Terns because they prey upon both eggs and young. Mammalian predators include skunk, coyote, Norway rat, domesticated cat, fox, and mink. Other common predators include owls and gulls. Finally, aquatic pollutants pose a threat to Common Terns as they are mainly piscivorous and are especially vulnerable to pollutants which have an adverse effect on eggs and young.

Starting in 2001, Seney NWR began to work cooperatively with the US Coast Guard at the St. Ignace moorings to protect one of the largest Common Tern colonies in Michigan, with a formal agreement signed between the parties in 2010. According to this agreement: "…between May 1 and September 30 (very conservative) no activity should be undertaken in the fenced portion of the pier. In addition, no buoys should be moved in or out of this area unless necessary for the safety of human life. During this same time period, the fence should be kept closed and

electrified, human activity within the colony should be kept to a minimum. Between May 1 and August 30, subject to the safety of the vessel or the well-being of the crew, cutters not home- ported in St. Ignace will not moor at the St. Ignace mooring. In the event that it is necessary for safety reasons to moor at the pier, cutters should not moor immediately adjacent to the tern colony. During the remaining eight months of the year, there should be few, if any, restrictions to human use of the pier. Minor alterations that need to be made to the pier (such as mowing) or any repair work should occur during these nine months. Routine Station operations and activities do not appear to impact the nesting birds or the nesting area. Routine CGC BISCAYNE BAY operations do not appear to impact the nesting birds or nesting area. Unusual or non-routine operations or activities for Station St. Ignace or CGC BISCAYNE BAY should be coordinated with CEU Cleveland before being undertaken."

Fairly consistent data have been kept at Seney NWR since 2010.

What is the population or attribute of interest, what will be measured, and when? Biological Integrity; At-risk Biota; *Sterna hirundo* (Common Tern); Recurring -- every year; Mid-May through August. Tern colonies either totally fail or have sporadic reproduction at the pair level. This survey is primarily concerned with eliminating total colony failure in any given year.

**Is this a cooperative survey? If so, what partners are involved in the survey?**
No

**Survey: *American Woodcock Singing Ground Survey***

(FF03RSNY00-021)

**Refuge**
Seney National Wildlife Refuge

**Priority**
1.08

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
CCP: Trust Resources; Wildlife, Habitat, Community, and Ecosystem Research;

**Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.**
This survey is conducted in conjunction with the national and international American Woodcock singing ground surveys. The survey provides an index of the current woodcock breeding population.

**What is the population or attribute of interest, what will be measured, and when?**
Biological Integrity; At-risk Biota; *Aves* (Birds); *Charadriiformes* (Auks, Oystercatchers, Plovers, Shore Birds, Gulls, Alcids); *Scolopax minor* (American Woodcock); Recurring -- every year; 1 night of the year; Number of peenting males.

**Is this a cooperative survey? If so, what partners are involved in the survey?**
Coop Baseline Monitoring; Michigan Department of Natural Resources, FWS WO, FWS RO

**Survey: *North American Amphibian Monitoring Program***

(FF03RSNY00-005)

**Refuge**
Seney National Wildlife Refuge

**Priority**
1.09

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
HMP: Open Water; Open Wetlands;

**Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.**
Michigan is home to 13 native species of anurans (frogs and toads). In recent years, many observers have been concerned with the apparent rarity, decline, and/or population die-offs of several of these species. This concern was not only for the species themselves, but also for the ecosystems on which they depend. Frogs and toads, like many other aquatic organisms, are sensitive to changes in water quality and adjacent land use practices, and their populations undoubtedly serve as an index to environmental quality. As a result, the Michigan Frog and Toad Survey was initiated in 1988 to increase our knowledge of anuran abundance and distribution, and to monitor populations over the long term. A statewide permanent system was developed and initiated in 1996. This cooperative survey is modeled after the very successful Wisconsin Frog and Toad Survey, which was started in 1981. Over the years, the Michigan Frog and Toad Survey will provide a wealth of information on the status of Michigan frog and toad populations and help monitor the quality of our environment. Seney NWR is an important part of this survey because it is one of the more consistent survey points in the Upper Peninsula and provides a sample for the underrepresented mink frog.

What is the population or attribute of interest, what will be measured, and when?
Biological Integrity; At-risk Biota; *Hyla chrysoscelis* (Cope's Gray Treefrog); *Hyla versicolor* (Gray Treefrog); *Lithobates sylvaticus* (Wood Frog); *Lithobates septentrionalis* (Mink Frog); *Lithobates clamitans* (Green Frog); *Lithobates pipiens* (Northern Leopard Frog); *Anaxyrus americanus* (American Toad); *Pseudacris crucifer* (Spring Peeper); Recurring -- every year; 3 times per year

**Is this a cooperative survey? If so, what partners are involved in the survey?**
Coop Baseline Monitoring; Michigan Department of Natural Resources

**Survey: *Wilderness Character Monitoring***

(FF03RSNY00-068)

**Refuge**
Seney National Wildlife Refuge

**Priority**
1.10

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
CCP: Trust Resources;

**Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.**
Per policy, all refuges with Wilderness Areas must conduct periodic monitoring and evaluation. Some findings on ecological patterns/processes and other changes to Wilderness character may spur management of land and/or people.

**What is the population or attribute of interest, what will be measured, and when?**
Human Use; Visitor and Recreation Use;

**Is this a cooperative survey? If so, what partners are involved in the survey?**
No

**Survey: *Wilderness Character Monitoring***

*(FF03RMCH00-008)*

**Refuge**
Michigan Islands National Wildlife Refuge

**Priority**
1.10

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
HMP: Maintain and Evaluate Wilderness Characteristics Yearly;

**Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.**
Per policy, all refuges with Wilderness Areas must conduct periodic monitoring and evaluation. Some findings on ecological patterns/processes and other changes to Wilderness character may spur management of land and/or people.

**What is the population or attribute of interest, what will be measured, and when?**
Human Use; Visitor and Recreation Use;

**Is this a cooperative survey? If so, what partners are involved in the survey?**
No

**Survey: *Seney portion: Periodic inspection***

*(FF03RMCH00-007)*

**Refuge**
Michigan Islands National Wildlife Refuge

**Priority**
1.10

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
HMP: Maintain and Evaluate Wilderness Characteristics Yearly;

**Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.**
Per policy, all refuges with Wilderness Areas must conduct periodic monitoring and evaluation. Some findings on ecological patterns/processes and other changes to Wilderness character may spur management of land and/or people.

**What is the population or attribute of interest, what will be measured, and when?**
Landscapes (Ecosystem Pattern and Processes); Landscape Dynamics; Recurring -- every year; 1x per year

**Is this a cooperative survey? If so, what partners are involved in the survey?**
No

**Survey: *Wilderness Character Monitoring***

*(FF03RHRN00-006)*

**Refuge**
Huron National Wildlife Refuge

**Priority**
1.10

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
HMP: Maintain and Evaluate Wilderness Characteristics Yearly;

**Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.**
Seney NWR must meet requirements of the Wilderness Act of 1964.

**What is the population or attribute of interest, what will be measured, and when?**
Human Use; Visitor and Recreation Use; Recurring - every year;

**Is this a cooperative survey? If so, what partners are involved in the survey?**
No

**Survey: *Periodic inspection.***

*(FF03RHRN00-002)*

**Refuge**
Huron National Wildlife Refuge

**Priority**
1.10

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
HMP: Maintain and Evaluate Wilderness Characteristics Yearly;

**Why is it important to conduct the survey?**
Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.

Per policy, all refuges with Wilderness Areas must conduct periodic monitoring and evaluation. Some findings on ecological patterns/processes and other changes to Wilderness character may spur management of land and/or people.

**What is the population or attribute of interest, what will be measured, and when?**
Landscapes (Ecosystem Pattern and Processes); Landscape Dynamics; Recurring -- every year; 1x per year

**Is this a cooperative survey? If so, what partners are involved in the survey?**
No

**Survey: *Periodic inspection.***

*(FF03RHBR00-002)*

**Refuge**
Harbor Island National Wildlife Refuge

**Priority**
1.10

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
HMP: Maintain and Evaluate de-facto Wilderness Characteristics Yearly;

**Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.**
This satellite refuge is ~4-5 hr. away from Seney NWR and is used by a boating community during the summer season when many boats can be found moored in the harbor. Effects of human use and the need to communicate rules and regulations should be evaluated qualitatively at least 1x per year.

**What is the population or attribute of interest, what will be measured, and when?**
Landscapes (Ecosystem Pattern and Processes); Landscape Dynamics; Recurring -- every year; 1x per year

**Is this a cooperative survey? If so, what partners are involved in the survey?**
No

**Survey: *North American Breeding Bird Survey***

(FF03RSNY00-014)

**Refuge**
Seney National Wildlife Refuge

**Priority**
1.11

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
HMP: Coniferous Forests-Lowlands; Coniferous Forests-Uplands; Deciduous Forests-Lowlands; Deciduous Forests-Uplands; Mixed Forests-Lowlands; Mixed Forests-Uplands;

**Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.**
The Breeding Bird Survey (BBS) is a long-term, large-scale, international avian monitoring program initiated in 1966 to track the status and trends of North American bird populations. The USGS Patuxent Wildlife Research Center and the Canadian Wildlife Service, National Wildlife Research Center jointly coordinate the BBS program.

**How are BBS data used?**

1. The U.S. Fish and Wildlife Service, Canadian Wildlife Service, and Partners in Flight all use BBS trends along with other indicators to assess bird conservation priorities.

2. BBS data were instrumental in focusing research and management action on neotropical migrant species in the late 1980s, and on grassland species in the mid-1990s.

3. State Natural Heritage programs and Breeding Bird Atlas projects often utilize BBS data to enrich their databases.

4. Educators often use BBS data as a tool to teach biological, statistical and GIS concepts.

5. More than 450 scientific publications have relied heavily, if not entirely, on BBS data. The entire BBS bibliography is viewable in PDF format or in field-searchable web format.

**What is the population or attribute of interest, what will be measured, and when?**
Biological Integrity; At-risk Biota; *Aves* (Birds); A*podiformes* (Swifts, Hummingbirds); *Piciformes* (Woodpeckers); *Podicipediformes* (Grebes); *Gruiformes* (Cranes, Rails); *Columbiformes* (Doves, Pigeons); *Gaviiformes* (Loons); *Passeriformes* (Perching Birds); A*nseriformes* (Screamers, Waterfowl, Ducks, Swans, Geese); *Charadriiformes* (Plovers, Auks, Oystercatchers, Alcids, Shore Birds, Gulls); *Coraciiformes* (Kingfishers, Rollers); *Cuculiformes* (Cuckoos); *Falconiformes* (Falcons, Falconiforms); *Pelecaniformes* (Ibises, Pelicans, Herons); *Accipitriformes* (Hawks); *Strigiformes* (Owls, Goatsuckers); Recurring - every year; 1 day per year

**Is this a cooperative survey? If so, what partners are involved in the survey?**
Coop Baseline Monitoring

United States Geological Survey (USGS)

**Survey: *Sharp-tailed Grouse Dancing Ground (Lek) Survey***

(FF03RSNY00-013)

**Refuge**
Seney National Wildlife Refuge

**Priority**
1.12

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
HMP: Open Wetlands; Upland Old Fields and Openland;

**Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.**
Nationwide, Sharp-tailed Grouse (*Tympanuchus phasianellus* or sharptail) population trends parallel the declines in openland habitats that have occurred over the last century (Knopf 1996). In Michigan, Seney NWR is an Important Bird Area for this species. To address long-term conservation planning concerns in the Upper Peninsula of Michigan, resource managers and researchers have been called upon to promote linkages between disjunct populations of sharptails. Since sharptails in Michigan's Upper Peninsula—including those at Seney NWR—represent the most easterly distribution of the species in the United States, the conservation of these populations may have important genetic consequences (Lesica and Allendorf 1995).

A state-listed species of special concern, the Sharp-tailed Grouse is an area-sensitive flagship species of large openland ecosystem complexes in the eastern Upper Peninsula. As an openland habitat generalist, sharptails can be associated with a number of other openland bird species of considerable conservation concern at the state, regional, or national levels. Because of the relatively wide ecological amplitude of sharptails and their need for large habitat blocks, their conservation has multi-species implications.

Once a premier game bird in the state (Losey *et al.* 2007), sharptails were once found in both the northern Lower Peninsula and throughout the Upper Peninsula. However, since the early 1950s sharptail numbers, and concomitantly the area in openland land cover types, have been on a steady decline. Presently, sizeable

numbers of birds are only found in Alger, Schoolcraft, Luce, Chippewa, and Mackinac Counties in Michigan. The annual lek survey is an attempt to estimate the population size of sharptails in Michigan (Drummer et al. 2011).

**What is the population or attribute of interest, what will be measured, and when?**
Biological Integrity; At-risk Biota; *Tympanuchus phasianellus* (Sharp-tailed Grouse); Recurring - every year; 2 or more times per year from 1 April - 15 May

**Is this a cooperative survey? If so, what partners are involved in the survey?**
Coop Monitoring to Inform Management

**Survey: *Fall Sandhill Crane Count***

(FF03RSNY00-008)

**Refuge**
Seney National Wildlife Refuge

**Priority**
1.13

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
HMP: Open Wetlands;

**Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.**
As a cooperative effort with the International Crane Foundation and Regional Office efforts at managing Sandhill Cranes (*Grus canadensis*) in the Midwest, the refuge is asked to participate in a spring and fall survey of these species each year.

**What is the population or attribute of interest, what will be measured, and when?**
Biological Integrity; At-risk Biota; Grus canadensis (Sandhill Crane); Recurring - every year; 1 day

**Is this a cooperative survey? If so, what partners are involved in the survey?**
Coop Baseline Monitoring; U.S. Fish and Wildlife Service, Regional Office, R3 Twin Cities; International Crane Foundation

**Survey: *International Crane Foundation Spring Crane Count***

(FF03RSNY00-018)

**Refuge**
Seney National Wildlife Refuge

**Priority**
1.13

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
HMP: Open Wetlands;

**Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.**
As a cooperative effort with the International Crane Foundation and Regional Office efforts at managing Sandhill Cranes (*Grus canadensis*) in the Midwest, the refuge is asked to participate in a spring and fall survey of these species each year.

What is the population or attribute of interest, what will be measured, and when?
Biological Integrity; At-risk Biota; *Grus canadensis* (Sandhill Crane); Recurring - every year; 1 survey over 5 hours

**Is this a cooperative survey? If so, what partners are involved in the survey?**
Coop Baseline Monitoring; International Crane Foundation

**Survey: *Ruffed Grouse Drumming Survey***

(FF03RSNY00-017)

**Refuge**
Seney National Wildlife Refuge

**Priority**
1.15

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
CCP: Wildlife, Habitat, Community, and Ecosystem Research; None. This survey is for a game species the State of Michigan (DNR) prioritizes for management.

**Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.**
As a cooperative effort with the Michigan DNR, the refuge is asked to participate in a spring drumming survey, which it has done for decades.

**What is the population or attribute of interest, what will be measured, and when?**
Biological Integrity; Other Biota; Bonasa umbellus (Ruffed Grouse); Recurring -- every year; 2 times per year from 20 April - 10 May; Number of drumming males.

**Is this a cooperative survey? If so, what partners are involved in the survey?**
Coop Baseline Monitoring; Michigan Department of Natural Resources

**Survey: *General Plant Survey and Upgrade of Refuge Plant Collection***

(FF03RSNY00-060)

**Refuge**
Seney National Wildlife Refuge

**Priority**
1.16

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
CCP: Wildlife, Habitat, Community, and Ecosystem Research;

Maintain biological/ecological integrity of forests and wetlands (multiple objectives).

**Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.**
The Seney NWR herbarium is a recognized state and regional resource and was established in the early 1940s.

**What is the population or attribute of interest, what will be measured, and when?**
Biological Integrity; Other Biota; *Plantae* (plants); *Caricaceae* (papayas); Sporadic or Ad Hoc; May-September; Specimens are collected, pressed, sent to the University of Michigan for identification, and then digitized for a regional archive.

**Is this a cooperative survey? If so, what partners are involved in the survey?**
No; The University of Michigan assists with identification and the Michigan Consortium of Botanists helps w/the archiving.

**Survey: *Historic water level data inventory and assessment***

(FF03RSNY00-015)

**Refuge**
Seney National Wildlife Refuge

**Priority**
2.01

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
HMP: Open Water;

**Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.**
Since the late 1930s the refuge has manipulated water levels. As the importance of the anthropogenic pools on the refuge has changed over time, so too has management. At present, no database or evaluation of all data pertaining to precipitation, water levels, proposed water level management, pool productivity (nutrient), etc. exists. This inventory and assessment will organize and catalog these data.

**What is the population or attribute of interest, what will be measured, and when?**
Landscapes (Ecosystem Pattern and Processes); Landscape Dynamics; Occurs one time only; weekly from ice out (March) ice up (December)

**Is this a cooperative survey? If so, what partners are involved in the survey?**
No

**Survey: *Rapid ecological assessment of forest cover of Huron* NWR**

*(FF03RHRN00-005)*

**Refuge**
Huron National Wildlife Refuge

**Priority**
2.02

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
HMP: Evaluate and Monitor Forest Ecosystems; CCP states ecosystem and habitat goals that are applicable. Draft HMP states that we should evaluate forest conditions.

**Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.**
Although management is unlikely, knowing status and trends is helpful. Forest ecosystems were identified as a Resource of Concern in HMP.

**What is the population or attribute of interest, what will be measured, and when?**
Landscapes (Ecosystem Pattern and Processes); Landscape Dynamics; Plantae (plants); Occurs one time only; July-September; Forest composition and structure.

**Is this a cooperative survey? If so, what partners are involved in the survey?**
No

**Survey: *Lake Huron tansy (Tanacetum huronense) inventory***

*(FF03RHBR00-008)*

**Refuge**
Harbor Island National Wildlife Refuge

**Priority**
2.03

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
HMP: Inventory and Monitoring;

**Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.**
Species is listed as Resource of Concern in HMP. No baseline data (presence) exists.

**What is the population or attribute of interest, what will be measured, and when?**
Biological Integrity; At-risk Biota; *Plantae* (plants); *Tanacetum bipinnatum* (Lake Huron tansy, camphor tansy); Occurs one time only;

**Is this a cooperative survey? If so, what partners are involved in the survey?**
No

**Survey: *Narrow-leaved reedgrass (Calamagrostis stricta) inventory***

*(FF03RHRN00-007)*

**Refuge**
Huron National Wildlife Refuge

**Priority**
2.04

**Which station management objective does the survey support? Is the objective derived from the CCP, interim objectives, HMP, or other?**
HMP: Inventory and Monitoring;

**Why is it important to conduct the survey? Describe how survey results will be used to make better informed refuge management decisions. If survey results are used to trigger a management response, identify the management response and threshold value for comparison to survey results.**
Species is listed as Resource of Concern in HMP. No baseline data (presence) exists.

**What is the population or attribute of interest, what will be measured, and when?**
Biological Integrity; At-risk Biota; *Plantae* (plants); *Calamagrostis stricta* (slimstem reedgrass, slim-stem reed grass, narrowspike reedgrass); Occurs one time only;

**Is this a cooperative survey? If so, what partners are involved in the survey?**
No

## References

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## Revising the IMP

The Project Leader will review the refuge capacity and status of surveys annually and determine which of the selected surveys will be implemented in that year. The PRIMR database was updated along with this IMP; it will be updated as approved protocols are linked to the selected surveys and when surveys are added or removed from the set of selected surveys.

The IMP will be revised according to I&M Policy and as CCP and HMP plans are modified (see Revision Signature Page). An IMP revision is triggered when surveys are added or removed from the set of selected surveys. IMP revisions require signatures from refuge staff, Regional I&M staff, Regional Refuge Biologist/Natural Resources Division Chief, but not the Refuge Supervisor or Regional Chief of Refuges.

## Appendix A. Criteria Used to Prioritize Surveys: 2006 Biological Program Review

Regional Office staff and Seney NWR held a Biological Program Review attended by local ecologists, biologists, etc. at Seney NWR on August 28-30, 2006. The results of the Biological Review were used to determine the priority ranking of some of the current surveys. The remaining surveys were assigned a priority score based on the results and approach of the Biological Program Review. The final report (Heglund *et al.* 2009), which details the ranking process, can be found on ServCat at: https://ecos.fws.gov/ServCat/Reference/Profile/16972.

## Appendix B. Prioritization Scores of Surveys Ranked during 2006 Biological Review

Ranking of 27 inventory and monitoring priorities based on the 2006 Biological Review, Seney NWR (Heglund *et al.* 2009; Appendix A). Thirteen professionals ranked each survey with three priority categories: high = 3, medium = 2, low = 1. Candidate surveys represent specific surveys or general information needs and were not always associated with specific protocols. Scores were then used as a starting reference to assign the survey status.

| Survey Name | Rank Mode | Rank Median | Rank Sum | Discussion (*= volunteer involvement) |
|---|---|---|---|---|
| Marsh bird monitoring | 3 | 3 | 37.5 | *Re-established; led by Michigan Natural Features Inventory (MNFI), state-wide program |
| Yellow Rail survey | 3 | 3 | 37 | *Part of marshbird survey, above |
| Kirtland's Warbler survey | 3 | 3 | 36 | *Led by Michigan DNR, done with the assistance of volunteers; multi-agency; state-wide program |
| USGS Breeding Bird Survey | 2 | 2 | 31 | Led by refuge staff; national program |
| Spring waterfowl counts | 2 | 2 | 29 | *De-emphasized, but still done with the assistance of volunteers as part of survey of priority species on pools (e.g., COLO, TRUS, OSPR, etc.) |
| Fall waterfowl counts | 2 | 2 | 29 | *De-emphasized, but still done with the assistance of volunteers as part of survey of priority species on pools (e.g., COLO, TRUS, OSPR, etc.) |

| Survey Name | Rank Mode | Rank Median | Rank Sum | Discussion (*= volunteer involvement) |
|---|---|---|---|---|
| Common Loon occupancy | 2 | 3 | 28.5 | *Led by refuge staff and done with the assistance of volunteers as part of survey of priority species on pools (e.g., COLO, TRUS, OSPR, etc.) |
| Clean Air: IMPROVE | 2 | 3 | 27 | *Led by refuge staff and done with the assistance of volunteers? |
| American Woodcock survey | 1 | 2 | 27 | Led by refuge staff; national program |
| Trumpeter Swan occupancy | 2 | 2 | 25.5 | *Led by refuge staff and done with the assistance of volunteers as part of survey of all priority species on pools (e.g., COLO, TRUS, OSPR, etc.) |
| Frog and toad survey | 2 | 2 | 25 | Led by Michigan DNR; multi-agency |
| Sharp-tailed Grouse survey | 2 | 2 | 24 | *Led by Michigan DNR and done with the assistance of volunteers; multi-agency |
| Osprey occupancy/productivity | 3 | 2 | 24 | * Led by refuge staff and done with the assistance of volunteers as part of survey of priority species on pools (e.g., COLO, TRUS, OSPR, etc.) |
| Ruffed Grouse drumming survey | 1 | 2 | 21 | Led by Michigan DNR; done by staff |
| Common Tern occupancy | 1 | 2 | 20.5 | Led by refuge staff (St. Ignace only); multi-agency and multi-national |

| Survey Name | Rank Mode | Rank Median | Rank Sum | Discussion (*= volunteer involvement) |
|---|---|---|---|---|
| Trumpeter Swan productivity | N/A | 2 | 20 | *Led by refuge staff and done with the assistance of volunteers as part of survey of all priority species on pools (e.g., COLO, TRUS, OSPR, etc.) |
| Bald Eagle occupancy/productivity | 3 | 2 | 20 | *De-emphasized, but still with the assistance of volunteers as part of survey of priority species on pools (e.g., COLO, TRUS, OSPR, etc.) |
| Common Loon productivity | N/A | 3 | 18 | *Led by refuge staff and done with the assistance of volunteers as part of survey of priority species on pools (e.g., COLO, TRUS, OSPR, etc.) |
| Fall Sandhill Crane survey | 1 | 1 | 18 | *Led by Regional Office, done with the assistance of volunteers |
| Winter track survey | 2 | 2 | 25 | Ended |
| Deer hunter check | 1 | 1 | 22 | Ended |
| Bald Eagle nest counts | N/A | 2 | 20 | Ended |
| Waterfowl banding | 2 | 2 | 21 | Ended |
| Black Tern | 1 | 2 | 18.5 | Ended |
| Christmas bird count | 1 | 1 | 16 | Ended |
| Eastern Bluebird boxes | N/A | 1 | 2 | Ended |
| Saw-whet Owl boxes | N/A | 1 | 2 | Ended |

*Survey primarily occurs in anthropogenic habitat(s).

## Appendix C. Estimated Annual Costs for Implementing Surveys

(Historic surveys are excluded, total cost includes operating and staff time costs).

| Survey Name | Survey ID Number | Survey Priority | Survey Status | FWS Staff Total | Total Cost |
|---|---|---|---|---|---|
| Annual Kirtland's Warbler Official Census: Lower and Upper Peninsulas of Michigan (CM) | FF03RKIW00-003 | 1.01 | Current | $769.00 | $1,019.00 |
| Piping Plover Census (CM) | FF03RSNY00-026 | 1.01 | Current | $519.00 | $719.00 |
| National Marsh Bird Monitoring and Research Program (CB) | FF03RSNY00-023 | 1.02 | Current | $2,308.00 | $2,608.00 |
| Pool Surveys for Trumpeter Swan, Osprey, Common Loon Occupancy and Productivity (M) | FF03RSNY00-027 | 1.03 | Current | $481.00 | $2,164.00 |
| Michigan Islands Colonial Waterbird Nest Count (CB) | FF03RMCH00-004 | 1.04 | Current | $962.00 | $1,654.00 |
| Forest Ecology-Restoration Research (Pattern/Process, Seney NWR - Kirtland's Warbler WMA) (CR) | FF03RSNY00-022 | 1.05 | Current | $3,846.00 | $3,846.00 |
| Wetland Ecology-Restoration Research (Pattern-Process) | FF03RSNY00-074 | 1.05 | Current | $3,846.00 | $3,846.00 |
| Mercury Deposition Network (CM) | FF03RSNY00-024 | 1.06 | Current | $500.00 | $3,010.00 |
| National Atmospheric Deposition Program (CB) | FF03RSNY00-012 | 1.06 | Current | $500.00 | $3,010.00 |

| Survey Name | Survey ID Number | Survey Priority | Survey Status | FWS Staff Total | Total Cost |
|---|---|---|---|---|---|
| Common Tern Survey and Reproductive Monitoring (M) | FF03RSNY00-029 | 1.07 | Current | $1,538.00 | $1,938.00 |
| American Woodcock Singing Ground Survey (CB) | FF03RSNY00-021 | 1.08 | Current | $192.00 | $217.00 |
| North American Amphibian Monitoring Program (CB) | FF03RSNY00-005 | 1.09 | Current | $462.00 | $492.00 |
| Seney NWR – Wilderness Character Monitoring (BM) | FF03RSNY00-068 | 1.10 | Current | $962.00 | $962.00 |
| Michigan Islands NWR - Wilderness Character Monitoring (BM) | FF03RMCH00-008 | 1.10 | Current | $962.00 | $1,943.00 |
| Michigan Islands NWR – Seney portion: Periodic inspection (BM) | FF03RMCH00-007 | 1.10 | Current | $962.00 | $1,943.00 |
| Huron NWR – Wilderness Character Monitoring (BM) | FF03RHRN00-006 | 1.10 | Current | $962.00 | $1,943.00 |
| Huron NWR – Periodic inspection. (BM) | FF03RHRN00-002 | 1.10 | Current | $962.00 | $1,943.00 |

## Appendix D. Estimated Annual Work Schedule for Selected Surveys, January – December.

| Survey Name | Survey Priority | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual Kirtland's Warbler Official Census: Lower and Upper Peninsulas of Michigan (CM) | 1.01 | - | - | - | P | T | FW | FW, DE, A. R. | - | - | - | - | - |
| Piping Plover Census (CM) | 1.01 | - | - | - | P | T., FW | FW, DE | FW, DE | FW, DE | R | - | - | - |
| National Marsh Bird Monitoring and Research Program (CB) | 1.02 | - | - | - | P | T., FW | FW | FW | DE, A. R. | A. R | - | - | - |
| Pool Surveys for Trumpeter Swan, Osprey, Common Loon Occupancy and Productivity (M) | 1.03 | - | - | - | P | T., FW | FW | FW | FW | DE, A. R | A. R | A. R | - |
| Michigan Islands Colonial Waterbird Nest Count (CB) | 1.04 | - | - | - | P | T., FW | FW | FW | FW | DE, A. R | - | - | - |
| Forest Ecology-Restoration Research (Pattern/ Process Seney NWR-Kirtland's Warbler WMA) (CR) | 1.05 | R. P. | R. P. | R. P. | P | T. FW. | FW | FW | FW | DE, A. R | DE, A. R | DE, A. R | DE, A. R |
| Wetland Ecology-Restoration Research (Pattern/Process, Seney NWR) (CR) | 1.05 | R, P | R, P | R, P | P | T, FW | FW | FW | FW | DE, A, R | DE, A, R | DE, A, R | DE, A, R |

| Survey Name | Survey Priority | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury Deposition Network (CM) | 1.06 | FW,DE | FW, DE | FW, DE | FW, DE | FW, DE | FW, DE | FW, DE | FW, DE | FW, DE | FW, DE | FW, DE | FW, DE |
| National Atmospheric Deposition Program (CB) | 1.06 | FW, DE | FW, DE | FW, DE | FW, DE | FW, DE | FW, DE | FW, DE | FW, DE | FW, DE | FW, DE | FW, DE | FW, DE |
| Common Tern Survey and Reproductive Monitoring (M) | 1.07 | – | – | – | P | T, FW | FW | FW | FW | DE, A, R | – | – | – |
| American Woodcock Singing Ground Survey (CB) | 1.08 | – | – | – | P | T, FW | FW, DE, A, R | – | – | – | – | – | – |
| North American Amphibian Monitoring Program (CB) | 1.09 | – | – | – | P | T, FW | FW | FW | DE, A, R | – | – | – | – |
| Seney NWR - Wilderness Character Monitoring (BM) | 1.10 | – | – | P | P | P, T, FW | P, T, FW | P, T, FW | DE, A, R | DE, A, R | DE, A, R | – | – |
| Michigan Islands NWR - Wilderness Character Monitoring (BM) | 1.10 | – | – | P | P | P, T, FW | P, T, FW | P, T, FW | DE, A, R | DE, A, R | DE, A, R | – | – |
| Michigan Islands NWR - Seney portion: Periodic inspection (BM) | 1.10 | – | – | P | P | P, T, FW | P, T, FW | P, T, FW | DE, A, R | DE, A, R | DE, A, R | – | – |
| Huron NWR - Wilderness Character Monitoring (BM) | 1.10 | – | – | P | P | P, T, FW | P, T, FW | P, T, FW | DE, A, R | DE, A, R | DE, A, R | – | – |
| Huron NWR - Periodic inspection. (BM) | 1.10 | – | – | P | P | P, T, FW | P, T, FW | P, T, FW | DE, A, R | DE, A, R | DE, A, R | – | – |

| Survey Name | Survey Priority | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Harbor Island NWR - Periodic inspection. (BM) | 1.10 | - | - | P | P | P, T, FW | P, T, FW | P, T, FW | DE, A, R | DE, A, R | DE, A, R | - | - |
| North American Breeding Bird Survey (CB) | 1.11 | - | - | P | P | P, T, FW | P, T, FW | P, T, FW | DE, A, R | R | R | - | - |
| North American Breeding Bird Survey (CB) | 1.11 | - | - | P | P | P, T, FW | P, T, FW | P, T, FW | DE, A, R | R | R | - | - |
| Sharp-tailed Grouse Dancing Ground (Lek) Survey (CM) | 1.12 | - | - | P | T, FW | FW, DE, A, R | - | - | - | - | - | - | - |
| Fall Sandhill Crane Count (CB) | 1.13 | - | - | - | - | - | - | - | P | T | FW | FW, DE, A, R | |
| International Crane Foundation Spring Crane Count (CB) | 1.13 | - | - | P | T, FW | FW, DE, A, R | - | - | - | - | - | - | - |
| Ruffed Grouse Drumming Survey (CB) | 1.15 | - | - | P | T, FW | FW, DE, A, R | - | - | - | - | - | - | - |
| General Plant Survey and Upgrade of Refuge Plant Collection (BM) | 1.16 | - | - | P | T, FW | FW | FW | FW | DE, A, R | - | - | - | - |
| Historic water level data inventory and assessment | 2.01 | DE | DE | - | - | - | - | - | - | - | DE | DE | DE |
| Huron NWR - Rapid ecological assessment of forest cover of Huron NWR | 2.02 | - | - | P | T, FW | FW | FW | FW | DE, A, R | - | - | - | - |
| Harbor island NWR - Lake Huron tansy (*Tanacetum huronense*) inventory | 2.03 | - | - | P | T, FW | FW | FW | FW | DE, A, R | - | - | - | - |

| Survey Name | Survey Priority | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Huron NWR - Narrow-leaved reedgrass (*Calamagrostis stricta*) inventory | 2.04 | - | - | P | T, FW | FW | FW | FW | DE, A, R | - | - | - | - |

P=Planning, T=Training, FW=Field Work, DE=Data Entry, A=Analysis, R=Reporting

## Appendix E. Non-selected Surveys

A status of future denotes surveys that have been prioritized but have low chance of being conducted during the span of the IMP because of low priority or because the capacity to conduct the survey will be difficult to secure. Historic status surveys have been recently completed or discontinued.

| Survey Name | Survey ID Number | Survey Status |
|---|---|---|
| American beaver lodge occupancy inventory | FF03RSNY00-070 | Future |
| Black-backed Woodpecker monitoring | FF03RSNY00-071 | Future |
| Spruce Grouse monitoring | FF03RSNY00-072 | Future |
| Wood turtle monitoring | FF03RSNY00-073 | Future |
| Experimental Use of Plantings and Tree Revetments to Stabilize Eroding Streambanks on the Driggs River | FF03RSNY00-049 | Historic |
| Survey of Invertebrates, Fishes, and Habitat Conditions in the Driggs River | FF03RSNY00-050 | Historic |
| Evaluation of Black Crappie Stocking on J-1, G-1, and C-3 Pools | FF03RSNY00-052 | Historic |
| Managing for an exotic wetland invader at Seney National Wildlife Refuge: Glossy buckthorn (*Frangula alnus*) | FF03RSNY00-006 | Historic |
| Woodland Raptor Survey | FF03RSNY00-038 | Historic |
| Butterfly Survey | FF03RSNY00-061 | Historic |
| Gypsy Moth Survey and Removal Trapping | FF03RSNY00-062 | Historic |
| Survey of Refuge Fish Communities | FF03RSNY00-053 | Historic |
| Survey of Threatened and Endangered Plants on Satellite Refuges in Lake Superior, Huron, and Michigan | FF03RSNY00-059 | Historic |
| Waterfowl Brood Survey | FF03RSNY00-031 | Historic |
| Mourning Dove Survey and Banding | FF03RSNY00-036 | Historic |
| Monitoring Production from Wood Duck Nest Boxes | FF03RSNY00-032 | Historic |
| Sedge Meadow Research | FF03RSNY00-011 | Historic |
| Canada Goose Collar Observations | FF03RSNY00-034 | Historic |

| Survey Name | Survey ID Number | Survey Status |
|---|---|---|
| Saw-whet Owl Survey, Capture, and Banding | FF03RSNY00-037 | Historic |
| Monitoring Sharp-tailed Grouse Movements and Habitat Use by Radiotelemetry | FF03RSNY00-035 | Historic |
| Monitoring Avian Productivity and Survivorship (MAPS) | FF03RSNY00-041 | Historic |
| Distribution and Reproduction of Common Loons | FF03RSNY00-043 | Historic |
| Restoration of a Nesting Colony of Common Terns on J-1 Pool | FF03RSNY00-044 | Historic |
| Black Tern Nest and Production Survey | FF03RSNY00-045 | Historic |
| Shorebird Survey | FF03RSNY00-046 | Historic |
| Survey of Gray Wolf and other Predators | FF03RSNY00-055 | Historic |
| White-tailed Deer Survey | FF03RSNY00-056 | Historic |
| Michigan Nightjar Survey | FF03RSNY00-025 | Historic |
| Effects of Walsh Ditch Plugs on Plants | FF03RSNY00-066 | Historic |
| Survey of Streambank Erosion Sites in the Manistique River Watershed | FF03RSNY00-065 | Historic |
| Eagle and Osprey nesting survey | FF03RSNY00-016 | Historic |
| Mercury Levels in Refuge Fishes and Hooded Mergansers | FF03RSNY00-063 | Historic |
| Audubon's Christmas Bird Count | FF03RSNY00-019 | Historic |
| Trumpeter swan feeding ecology study | FF03RSNY00-004 | Historic |
| National Abnormal Amphibian Monitoring Project | FF03RSNY00-007 | Historic |
| Canada Goose Banding and Blood Sampling for Leucocytozoan | FF03RSNY00-033 | Historic |
| Water and Bottom Substrate Quality in Refuge Pools | FF03RSNY00-048 | Historic |
| Weekly Spring and Fall Waterfowl Counts | FF03RSNY00-002 | Historic |
| Hiawatha Breeding Bird Survey | FF03RSNY00-039 | Historic |
| Kirtland's Warbler Color-Banding in Lower Peninsula | FF03RSNY00-040 | Historic |

| Survey Name | Survey ID Number | Survey Status |
|---|---|---|
| Production and Species Composition of Aquatic Plants in Refuge Pools | FF03RSNY00-047 | Historic |
| Waterfowl Use Survey | FF03RSNY00-030 | Historic |
| Winter furbearer | FF03RSNY00-003 | Historic |
| Whooping Crane Reintroduction Research: Monitoring Reproduction of Isolation-reared Sandhill Cranes | FF03RSNY00-042 | Historic |
| Yellow Rail Survey | FF03RSNY00-020 | Historic |
| Trumpeter swan breeding survey | FF03RSNY00-009 | Historic |
| Refuge Common Loon Survey | FF03RSNY00-010 | Historic |
| Rapid ecological assessment of Kirtland's Warbler WMA[15] | FF03RKIW00-002 | Historic |
| Herring Gull Biosentinel Monitoring of Great Lakes: Bioaccumulative Chemicals[16] | FF03RHRN00-003 | Historic |
| Survey of Threatened and Endangered Plants on Satellite Refuges in Lake Superior, Huron, and Michigan[16] | FF03RHRN00-004 | Historic |
| Deer Exclosure Study on Harbor Island[17] | FF03RHBR00-006 | Historic |
| Rapid ecological assessment of forest cover of Harbor Island NWR[17] | FF03RHBR00-004 | Historic |
| Survey of Threatened and Endangered Plants on Satellite Refuges in Lake Superior, Huron, and Michigan[17] | FF03RHBR00-003 | Historic |

[15] Kirtland's Warbler WMA
[16] Huron NWR
[17] Harbor Island NWR

## Appendix F. Refuge Condition Summary

This summary can be used as a reporting tool throughout the life of the IMP to track the status, trends, and desired conditions of the selected surveys. Updates to summary can be made during annual reviews and reported in Annual Habitat Work Plans (AHWP). Updates to this table do not require an IMP revision, but should be uploaded as a digital file associated with the ServCat record that contains the approved IMP.

**Table 2: Seney NWR and Satellites- REFUGE SUMMARY TABLE**

**Date of last update: 1/21/2016**

| Resource Theme Level 1[18] | Resource Theme Level 2[18] | Attribute[19] | Current Condition (values)[20] | Source of Current Condition[21] | Desired Condition (values)[22] | Source of Desired Condition[23] | Within Desired Condition?[24] | Survey Name and PRIMR ID[25] |
|---|---|---|---|---|---|---|---|---|
| Biological Integrity | At-risk Biota | Kirtland's Warbler - monitor breeding populations | 2,365 singing males (>90% on Michigan DNR and US Forest Service lands) | Michigan Department of Natural Resources; USFWS East Lansing Field Office | >1,000 singing males total | 2015 Kirtland's Warbler Breeding Range Conservation Plana[26] | Yes | Annual Kirtland's Warbler Official Census: Lower and Upper Peninsulas of Michigan (FF03RKIW00-003) |

[18] The rank for each survey listed in order of priority (e.g., numeric, tiered, alpha-numeric, or combination of these).
[19] A unique identification number consisting of refuge code-computer assigned sequential number. Refuge code comes from the FBMS cost center identifier.
[20] Short titles for the survey name, preferably the same name used in refuge work plans. Also include the PRIMR code for survey type in parentheses. These are: Inventory (I), Cooperative Baseline Monitoring (CB), Monitoring to Inform Management (M), Cooperative Monitoring to Inform Management (CM), Research (R), and Cooperative Research (CR).
[21] Selected surveys planned for the lifespan of this IMP (i.e., Current, Expected).
[22] The management plan and objectives that justify the selected survey.
[23] Refuge management unit names, entire refuge, or names of other landscape units included in survey.
[24] Estimates of Service (FWS) and non-Service (Other) staff time needed to complete the survey (1 work year = 2080 hours = 1 FTE).
[25] Estimates of average annual operations cost for conducting the survey during the years it is conducted (e.g., equipment, contracts, travel) but not including staff time.
[26] Michigan Department of Natural Resources, US Fish and Wildlife Service, US Forest Service. 2015. Kirtland's warbler breeding range conservation plan. Lansing, MI.

| Resource Theme Level 1[18] | Resource Theme Level 2[18] | Attribute[19] | Current Condition (values)[20] | Source of Current Condition[21] | Desired Condition (values)[22] | Source of Desired Condition[23] | Within Desired Condition?[24] | Survey Name and PRIMR ID[25] |
|---|---|---|---|---|---|---|---|---|
| Biological Integrity | At-risk Biota | Piping Plover - monitor breeding populations | 75 nesting pairs Great Lakes-wide as of 2015*, 1 at Whitefish Point Unit of Seney NWR | East Lansing Ecological Services Field Office | 150 breeding pairs Great Lakes States/Provinces | Recovery Plan[27] | No | Piping Plover Census (FF03RSNY00-026) |
| Biological Integrity | At-risk Biota | Marsh birds - monitor breeding populations | N/A | Data are provided to Michigan Natural Features Inventory (MNFI); data are then pooled into the national database | N/A | Ongoing research (Mike Monfils, MNFI) | N/A | National Marsh Bird Monitoring and Research Program (FF03RSNY00-023) |
| Biological Integrity | At-risk Biota | Colonial waterbirds - monitor breeding populations | Different condition for different colonial waterbird species | Great Lakes Colonial Waterbird Survey; see citation in 2015 Michigan Islands section of Island HMP | N/A | 2015 Michigan Islands section of Island HMPc[28] | N/A | Michigan Islands Colonial Waterbird Nest Count (FF03RMCH00-004) |

[27] USFWS. 2003. Recovery Plan for the Great Lakes Piping Plover (*Charadrius melodus*) U.S. Fish and Wildlife Service. Fort Snelling, Minnesota.

[28] US Fish and Wildlife Service. 2015. Habitat Management Plan for Huron, Harbor Island, and Michigan Islands NWR. USFWS Regional Office, Fort Snelling, MN.

| Resource Theme Level 1[18] | Resource Theme Level 2[18] | Attribute[19] | Current Condition (values)[20] | Source of Current Condition[21] | Desired Condition (values)[22] | Source of Desired Condition[23] | Within Desired Condition?[24] | Survey Name and PRIMR ID[25] |
|---|---|---|---|---|---|---|---|---|
| Biological Integrity | At-risk Biota | Common Tern - monitor and protect breeding populations | >1,000 breeding pairs | In-house data, F. Cuthbert (Univ. of MN), draft research paper | Signed cooperative agreement between the U.S. Coast Guard and Seney NWR (see Seney NWR files); colony success/failure (abandonment) is binary; no colony abandonment in a given season = desired condition | 2013 Seney NWR HMP[29]; Common Tern Conservation Plane | Yes | Common Tern Survey and Reproductive Monitoring (FF03RSNY00-029) |
| Biological Integrity | At-risk Biota | American Woodcock - monitor breeding populations; number of peenting males | Driggs River Rd. Route = 12 peenting birds | In-house data; National AMWO Singing Ground Dbase (USFWS) | N/A | N/A | N/A | American Woodcock Singing Ground Survey (FF03RSNY00- 021) |
| Biological Integrity | At-risk Biota | Sandhill Crane - population monitoring | N/A | R3 Migratory Birds Office | N/A | N/A | N/A | Fall Sandhill Crane Count (FF03RSNY00- 008) |

[29] US Fish and Wildlife Service. 2013. Habitat Management Plan for Seney NWR. USFWS Regional Office, Fort Snelling, MN.

| Resource Theme Level 1[18] | Resource Theme Level 2[18] | Attribute[19] | Current Condition (values)[20] | Source of Current Condition[21] | Desired Condition (values)[22] | Source of Desired Condition[23] | Within Desired Condition?[24] | Survey Name and PRIMR ID[25] |
|---|---|---|---|---|---|---|---|---|
| Biological Integrity | At-risk Biota | Trumpeter Swan, Osprey, Common Loon - population monitoring | TRUS = 168 "white birds"; COLO = 20 territorial pairs; OSPR = 4 nesting pair | In-house data; refuge published papers (see HMP) available on ServCat/Seney science webpage | TRUS = average of 235 "white birds" per year; COLO = 13 territorial pairs; no value for OSPR | 2013 Seney NWR HMP[30] | TRUS = no (but this is good as birds are colonizing other sites in the eUP); COLO = yes; OSPR = no desired condition | Pool Surveys for Trumpeter Swan, Osprey, Common Loon Occupancy and Productivity (FF03RSNY00-027) |
| Biological Integrity | At-risk Biota | Sandhill Crane - population monitoring | 118 total SACR | International Crane Foundation, Baraboo, WI | N/A | N/A | N/A | International Crane Foundation Spring Crane Count (FF03RSNY00-018) |
| Biological Integrity | At-risk Biota | conduct inventory of Resource of Concern | N/A | Plant species are verified by Univ. of Michigan museum; new species are digitized and updated to the Michigan Consortium of Botanists and regional online systems | Unknown | Unknown | Unknown | Harbor Island NWR - Lake Huron tansy (*Tanacetum huronense*) inventory (FF03RHBR00-008) |
| Biological Integrity | At-risk Biota | conduct inventory of Resource of Concern | N/A | Plant species are verified by Univ. of Michigan museum; new species are digitized and updated to the Michigan Consortium of Botanists and regional online systems | Unknown | Unknown | Unknown | Huron NWR - Narrow-leaved reedgrass (*Calamagrostis stricta*) inventory (FF03RHRN00-007) |

[30] US Fish and Wildlife Service. 2013. Habitat Management Plan for Seney NWR. USFWS Regional Office, Fort Snelling, MN.

| Resource Theme Level 1[18] | Resource Theme Level 2[18] | Attribute[19] | Current Condition (values)[20] | Source of Current Condition[21] | Desired Condition (values)[22] | Source of Desired Condition[23] | Within Desired Condition?[24] | Survey Name and PRIMR ID[25] |
|---|---|---|---|---|---|---|---|---|
| Biological Integrity | Other Biota | Amphibian population, abundance, and distribution monitoring | Different for each species | In-house; data are provided to Michigan Department of Natural Resources each year | N/A | N/A | N/A | North American Amphibian Monitoring Program (FF03RSNY00-005) |
| Biological Integrity | Other Biota | Sharp-tailed Grouse-monitor breeding populations | N/A | In-house; data are provided to Michigan Department of Natural Resources each year | N/A | N/A | N/A | Sharp-tailed Grouse Dancing Ground (Lek) Survey (FF03RSNY00- 013) |
| Biological Integrity | Other Biota | Breeding birds population monitoring | N/A | Data are uploaded to U.S. Geological Survey's BBS website each year | N/A | N/A | N/A | North American Breeding Bird Survey (FF03RSNY00-014) |
| Biological Integrity | Other Biota | Monitor Ruffed Grouse breeding populations; number of drumming males | 12 drumming RUGR | In-house; data are provided to Michigan Department of Natural Resources each year | N/A | N/A | N/A | Ruffed Grouse Drumming Survey (FF03RSNY00-017) |
| Biological Integrity | Other Biota | maintain inventory of plant species | N/A | In-house species list for all organisms are updated yearly; plant species are verified by Univ. of Michigan museum; new species are digitized and updated to the Michigan Consortium of Botanists and regional online systems | N/A | N/A | N/A | General Plant Survey and Upgrade of Refuge Plant Collection (FF03RSNY00-060) |

| Resource Theme Level 1[18] | Resource Theme Level 2[18] | Attribute[19] | Current Condition (values)[20] | Source of Current Condition[21] | Desired Condition (values)[22] | Source of Desired Condition[23] | Within Desired Condition?[24] | Survey Name and PRIMR ID[25] |
|---|---|---|---|---|---|---|---|---|
| Air and Climate | Air Quality | monitor air quality | 2014 - 5.1 (ug/m²/yr) | http://nadp.isws.illinois.edu and USFWS Air Quality Branch | Unknown | Clean Air Act and USFWS Air Quality Branch[31] | TBD | Mercury Deposition Network (FF03RSNY00-024) |
| Landscapes (Ecosystem Pattern and Processes) | Landscape Dynamics | Effects of human use | N/A | Form will be created and data will be kept in-house | N/A | 2015 Michigan Islands section of Island HMP[32] | N/A | Harbor Island NWR - Periodic inspection. (FF03RHBR00-002) |
| Landscapes (Ecosystem Pattern and Processes) | Landscape Dynamics | Organize and describe refuge water management history | N/A | N/A | N/A | N/A | N/A | Historic water level data inventory and assessment (FF03RSNY00-015) |
| Landscapes (Ecosystem Pattern and Processes) | Landscape Dynamics | Forest ecology – quantifying patterns and processes | Depends on forest type, see habitat types discussions in island HMP | See citations in 2015 island HMP; rapid ecological assessment report on ServCat for Harbor Island NWR | Unknown | Unknown | Unknown | Huron NWR - Rapid ecological assessment of forest cover of Huron NWR (FF03RHRN00-005) |
| Human Use | Visitor and Recreation Use | Wilderness - Effects of human use | Depends on variable | Depends on variable | Depends on variable | See Wilderness Character Monitoring Reports in ServCat | Depends on variable | Seney NWR - Wilderness Character Monitoring (FF03RSNY00-068) |

[31] United States Code Title 42 Chapter 85

[32] US Fish and Wildlife Service. 2015. Habitat Management Plan for Huron, Harbor Island, and Michigan Islands NWR. USFWS Regional Office, Fort Snelling, MN.

| **Resource Theme Level 1**[18] | **Resource Theme Level 2**[18] | **Attribute**[19] | **Current Condition (values)**[20] | **Source of Current Condition**[21] | **Desired Condition (values)**[22] | **Source of Desired Condition**[23] | **Within Desired Condition?**[24] | **Survey Name and PRIMR ID**[25] |
|---|---|---|---|---|---|---|---|---|
| Human Use | Visitor and Recreation Use | Wilderness - Effects of human use | Depends on variable | Depends on variable | Depends on variable | See Wilderness Character Monitoring Reports in ServCat | Depends on variable | Michigan Islands NWR - Wilderness Character Monitoring (FF03RMCH00-008) |
| Human Use | Visitor and Recreation Use | Wilderness - Effects of human use | Depends on variable | Depends on variable | Depends on variable | See Wilderness Character Monitoring Reports in ServCat | Depends on variable | Huron NWR - Wilderness Character Monitoring (FF03RHRN00-006) |

## Appendix G. Environmental Action Statement (EAS)

Within the spirit and intent of the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA) (40 CFR 1500-1508), and other statutes, orders, and policies that protect fish and wildlife resources, I have established the following administrative record and determined that the following proposed action does not require additional NEPA documentation.

Proposed Action, Alternatives, and NEPA Documentation

The proposed action is to implement an Inventory and Monitoring Plan (IMP) for Seney National Wildlife Refuge and satellites (Kirtland's Warbler Wildlife Management Area, Harbor Island National Wildlife Refuge, Huron National Wildlife Refuge, and Michigan Islands National Wildlife Refuge). This IMP is a refinement of the 2009 (Seney NWR and Kirtland's Warbler WMA) and 2013 (Gravel Island, Green Bay, Harbor Island, Huron, and Michigan Islands NWR) Comprehensive Conservation Plans (CCP) and associated Environmental Assessment (EA) for the Refuges. This IMP provides more-specific guidance for surveys of Refuge's fish, wildlife, plant, habitat, and abiotic resources to fulfill the Refuge's purposes and help achieve Refuge's goals and objectives.

The EA for Seney National Wildlife Refuge CCP and satellites CCPs included goals and objectives for the refuge and assessed the impacts associated with a range of reasonable alternatives to achieve those goals and objectives. The rationale for selection of one specific alternative for implementation is explained in the Finding of No Significant Impact (FONSI) accompanying the final CCPs. The goals, objectives, and survey strategies included in this IMP fall within the bounds of those described and assessed in the CCPs and EAs or EISs.

Pursuant to 40 CFR 1502.9, no additional NEPA documentation is required to implement this IMP beyond the EA and FONSI prepared concurrently with the CCPs. No substantial changes to the proposed action alternative that was identified, analyzed, and selected for implementation within the CCP, EA, and FONSI are proposed through this IMP. Similarly, no significant new information or circumstances exist relevant to environmental concerns and bearing on the proposed action or its impacts.

In accordance with 43 CRF 46.205 and 40 CFR 1508.4, some surveys within this IMP are covered by the following Departmental categorical exclusion because they would not have significant environmental effects.

"Research, inventory, and information collection activities directly related to the conservation of fish and wildlife resources which involve negligible animal mortality or habitat destruction, no introduction of contaminants, or no introduction of organisms not indigenous to the affected ecosystem." 516 DM 8.5B(1).

_____ _____

Project Leader/Refuge Manager Date

*[Note: this signature and dating is not required if a statement is placed below the IMP signature page indicating that the Project Leaders signing of that page applies to all contents of this IMP].*

**References:**

U.S. Fish and Wildlife Service. 2009. Comprehensive Conservation Plan for Seney National Wildlife Refuge. USFWS Region 3. Bloomington MN.

U.S. Fish and Wildlife Service. 2009. Comprehensive Conservation Plan for Kirtland's Warbler Wildlife Management Area. USFWS Region 3. Bloomington MN.

U.S. Fish and Wildlife Service. 2013. Comprehensive Conservation Plan for Gravel Island, Green Bay, Harbor Island, Huron, and Michigan Islands National Wildlife Refuges. USFWS Region 3. Bloomington MN.

**IMP Revision Signature Page**

**IMP Revisions**

Seney National Wildlife Refuge and Satellites (Kirtland's Warbler WMA, Harbor Island NWR, Huron NWR, and Michigan Islands NWR).

| ***Action*** | ***Signature/Printed Name*** | ***Date*** |
|---|---|---|
| Survey list and priority changed | _____ | _____ Date |
| Submitted by: Refuge Manager | _____ | _____ Date |
| Reviewed by: Regional I&M Coordinator | _____ | _____ Date |
| Approved by: Refuge Supervisor | _____ | _____ Date |