



# RAPID RESPONSE PLAN FOR INVASIVE RODENTS IN ALASKA

UNITED STATES FISH AND WILDLIFE SERVICE  
ALASKA REGION, ANCHORAGE, ALASKA  
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**Cover page photo:**

Parakeet auklets; Seabirds of Buldir Island, Alaska Maritime National Wildlife Refuge.  
 Photo credit R. Dugan/USFWS

**INTRODUCTION TO INVASIVE RODENTS IN ALASKA**

Invasive rodents within the family *Muridae* are some of the most successful and widespread invasive species on the planet. The most notorious of these species include the Norway rat (also known as the brown or sewer rat *Rattus norvegicus*), the roof rat (also known as the black or ship rat *Rattus rattus*), and the house mouse (*Mus musculus*). All three of these species have a near global distribution and can be found on every continent with the exception of Antarctica (CABI 2020). Invasive rodents are also among the most destructive invasive species on Earth (Lowe et al. 2000), causing billions of dollars in economic damage annually in the United States alone (Pimental et al. 2000). Additionally, they serve as hosts for a number of pathogens including those of concern to both human and wildlife health (e.g., Meerburg et al. 2009; Himsforth et al. 2013), and are voracious predators capable of driving prey species to extinction (Island Conservation 2006).

Rodents are smart, secretive, and reproduce quickly. These traits have enabled them to establish populations in almost any place humans are found. As stowaways on ships, rodents have also reached even remote uninhabited islands - coming ashore when boats run aground "rat spills". Or have been unintentionally introduced at harbors and ports through normal shipping activities, through smaller water craft, and even via planes. Impacts of rodent introductions on islands are severe, especially as many island species have no evolutionary history with these predatory species. Island Conservation, a California-based invasive species eradication group, estimates that rats have caused 40-60% of all recorded seabird and reptile extinctions since 1600 (Island Conservation 2006). On islands where they have been introduced, consequent native species declines can have cascading effects on the entire island ecosystem, impacting even species that are not directly preyed upon or that compete with introduced rodents (Island Conservation 2006; Fritts 2007). For these reasons, preventing the invasion and establishment of rodents is key to protecting vulnerable island and otherwise rat-free ecosystems.

Invasive rodents can be particularly devastating in Alaska, which hosts nearly 95% of seabirds, and nearly 50% of all of the shorebirds that occur in North America. Several of these species and sub-species breed only in Alaska, and eight seabird species nest nowhere else in North America (Hatch and Piatt 1995; Fritts 2007). The state also harbors a number of endemic birds and mammals. Endemic species are especially susceptible to decline due to their relatively small population sizes, use of restricted resources, and high degree of specialization, making them less able to cope with change (Fritts 2007). For centuries, most of the islands in western Alaska were not home to any non-human mammals, making them ideal nesting and feeding grounds for large congregations of birds. The purposeful introduction of nonnative mammals, such as fox, and inadvertent introductions of rats, have already led to severe degradation of some island ecosystems in Alaska (Fritts 2007). Non-island ecosystems are also at risk from rodents, as increased numbers of shipping lanes and harbor development have opened new pathways of introduction to coastal areas and cities across the state. Preventing further introduction of nonnative species, particularly voracious predators like rodents, is a high priority of the United States Fish and Wildlife Service (Service) and other federal and state agencies, conservation groups, and Alaska Native organizations.

In Alaska, 26 islands and communities have confirmed breeding populations of rats (both Norway and roof rats), and 12 other cities, villages and islands have reported the presence of rats, though the breeding status is unknown (Figure 1, Appendix A, from Alaska Regional Response Team Wildlife Protection Committee 2020 and Fritts 2007). The distribution of house mice across Alaska is not as well understood, but they have likely been introduced into

Introduction

communities throughout the state. Some efforts to eliminate invasive rat populations in Alaska have occurred (e.g., in 2008 on Rat Island, now known as Hawadax), but prevention is far more efficient and effective. In some rodent-free parts of Alaska, such as the Pribilof Islands, active education and defensive trapping programs have been maintained to serve as a first line of defense against rodent invasion.

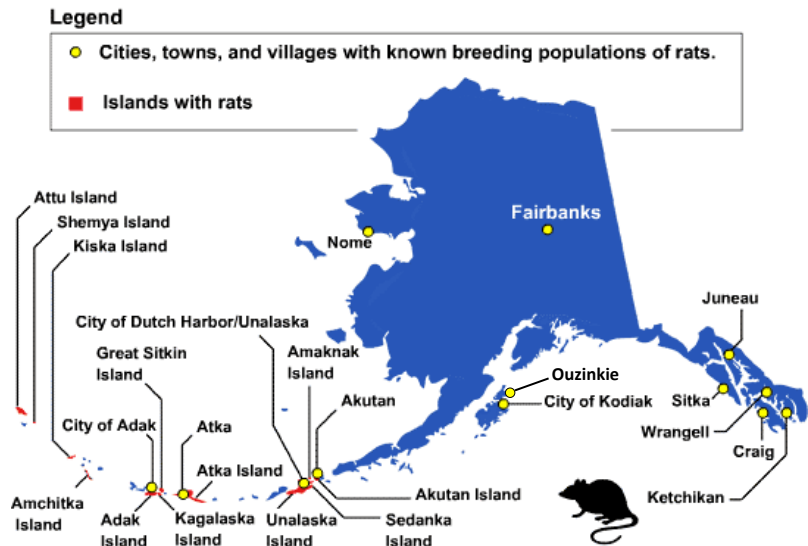
Even with robust prevention efforts, rodent introductions may still occur. In such instances, rapid response is key to limiting damage and preventing invasive rodents from

becoming established. The objective of a rapid response is eradication of an invasive species before a founding population can be established (DOI 2016). This document outlines rapid response actions that should be taken to a rodent sighting in a previously rodent-free area or in the event of a potential ship grounding and subsequent rat spill. Eradication of established breeding populations of rodents is a much larger and longer-term effort; therefore, it is outside the scope of this document.

The goal of this document is to consolidate information and facilitate communication within the United States Fish and Wildlife Service, as well as among Service partners. Many actions outlined in this document are specific to the Service, and may not be relevant for other agencies or organizations. However, the specific tasks outlined within each step can be modified to reflect the mandates, authorities, and jurisdictions of other agencies or organizations. Thereby serving as a tool for any group or agency completing rapid response actions for invasive rodents in Alaska.

Portions of this text excerpted and revised from: Fritts, E. I. (2007). *Wildlife and People at Risk: A Plan to Keep Rats Out of Alaska*. Alaska Department of Fish and Game. Juneau Alaska. 190 pp.

## Where The Rats Are



**Figure 1.** Location of known breeding populations of rats in Alaska. Most efforts taken to characterize rodent distributions in Alaska have focused on islands. The distribution of rodents across mainland Alaska is less well understood. (Figure from Alaska Regional Response Team Wildlife Protection Committee 2020, updated from Fritts 2007).

### Step 1: Be Prepared

#### □ **STEP 1: PREPARATION FOR INVASIVE RODENT RESPONSE**

This step outlines immediate actions that should be taken to increase capacity to respond to a new report of invasive rodents in Alaska. Advanced preparation is an integral component of rapid response. While some of these tasks are specific to the Service, other entities can modify these actions as appropriate to be prepared to respond to invasive rodent introductions.

#### **Step 1 Strategic Tasks**

- 1) Review Federal and state laws and regulations regarding authorities of the Service to manage invasive species and laws pertaining to invasive rodents in Alaska ([Tool 1.1](#)).
- 2) The Service should identify at least two individuals to receive and maintain a current Pesticide Applicator Certification from the Alaska Department of Environmental Conservation (ADEC) ([Tool 1.2](#)). For individuals who apply pesticides, whether indoors or outdoors, to manage ONLY rodents, including mice, rats, and voles, the Limited Vertebrate Pest Control certification is required in the state of Alaska.
  - a) This certification is good 1-3 years depending on test scores, and applicators must be [re-certified upon expiration](#).
  - b) Certified applicators should be available on notice of just a few days to deploy to any remote site in Alaska where they are needed for rapid response. Having at least two qualified applicators increases the likelihood of at least one being available any time they are needed. The second trained employee can provide rotational relief on a longer response.
- 3) Develop and enact Hazard Analysis and Critical Control Point (HACCP)/biosecurity plans for rodents on all National Wildlife Refuges (Refuge) in Alaska—particularly those with coastal resources near shipping routes and with areas of high shipping traffic ([Tool 1.3](#)).
  - a) HACCP planning is a management tool that provides a structured method to identify risks and focus procedures, and is being successfully used in natural resource pathway activities. Each Refuge and Fish and Wildlife Conservation Office (FWCO) should identify at least one individual to receive HACCP training. See [Tool 1.2](#) for detail.
  - b) The Alaska Maritime National Wildlife Refuge has developed a biosecurity plan with the stated goal to: ‘ignite a culture of biosecurity on the Refuge and provide clear expectations and protocols for employees and visitors in a simple, concise package.’ This plan focuses on a wide array of potential invasive species, but includes specific details for preventing rodent introductions. Contact the Regional Invasive Species Program Coordinator or Alaska Maritime staff for a copy of this plan.
- 4) Rodent-proof waterfront facilities and vessels, and install defensive trap stations in areas where rodents could be introduced ([Tool 1.3](#)).
  - a) The Alaska Sea Grant and the Alaska Department of Fish and Game (ADF&G) have developed a plan for rat control at Alaska waterfront facilities. Draw from this document, provided in [Tool 1.3](#).
  - b) Rodent proofing should be done at all facilities operated by the Service. Additionally, Refuge and FWCO staff should work with other land owners on outreach and control efforts at entry points near Refuges or FWCOs.
- 5) Stage response materials at key locations (see [Tool 1.4](#)). Rodent observations can occur in very remote locations. Having supplies available at field camps, villages, or other locations nearest to high risk areas can facilitate response efforts. Additionally, supplies should be stored at locations from which the response/strike teams are likely to be

**Step 1: Be Prepared**

- deployed.
- a) For example, general use kits containing supplies appropriate for response on inhabited islands or in inhabited areas can be staged in places like Homer, Kodiak, or Kaktovik. Kits for uninhabited areas can be staged on St. Paul Island for use on St. Matthew, Walrus, or Otter Islands.
  - b) Rodent response materials should include non-perishable items. Rodenticides should **not** be stockpiled, as they are extremely toxic and therefore risky to keep in large quantities. Keeping track of expiration dates and properly disposing of expired materials is also challenging in remote locations. If needed for response, rodenticides can generally be acquired rapidly.
  - c) Mobile spike camp kits should be located in strategic locations, such as Adak, Homer, and Anchorage. These kits include basic camping and survival gear for two people to stay on-scene in remote Alaska locations.
- 6) A Minimum Requirements Analysis will be required for any actions taken in federally designated Wilderness. Refuges with Wilderness areas that have the potential to be threatened by invasive rodents should complete a wilderness review to decide on acceptable rodenticides, trapping locations, site access, etc. that can go into a Minimum Requirements Analysis (MRA). This will facilitate rapid completion of the MRA in the event rodents are detected. Additional detail regarding invasive species control in Wilderness is provided in [Tool 5.3](#).

**Step 1 Roles and Responsibilities**

- Funding from the Regional Office is available to support Pesticide Applicator and HACCP trainings for Refuge and FWCO staff. Contact the Alaska Region’s Regional Invasive Species Program Coordinator: Aaron Martin; Office: (907) 786-3510, Cell: (907) 378-0568, [aaron\\_e\\_martin@fws.gov](mailto:aaron_e_martin@fws.gov) for information.

**Step 1 Tools**

**Tool 1.1. Regulations and Policy Relating to Invasive Species**

[Summary of Laws and Regulations under which the Service conducts invasive species activities](#)

[Detail regarding Alaska Rodent Laws](#)

**Tool 1.2. Training Information Links**

[HACCP Training Information](#)

[DEC Certified Pesticide Applicator Training Information](#) and [ADEC Re-certification Information](#)

**Tool 1.3. Biosecurity**

[Link to HACCP Template](#)

[Johnson, T. \(2008\). Rat Control for Alaska Waterfront Facilities– Fairbanks, Alaska: Alaska Sea Grant College Program, University of Alaska Fairbanks, 2008.](#)

[Rat Prevention Guidelines for Vessels](#)

Additional guidelines from the Alaska Regional Response Team Wildlife Protection Committee

### Step 1: Be Prepared

Wildlife Protection Guidelines for Oil Spill Response in Alaska, 2020, specific to vessels:

#### **Be Knowledgeable and Ready**

- Assume any port in the contiguous U.S. (the “lower 48”) has rats.
- Good sanitation is a key to prevention; keep food and garbage in tightly sealed storage areas to avoid attracting rats.
- Familiarize yourself and your crew with rat sign, such as chewed materials, hair, rub marks, feces and urine. Periodically search dark and concealed spaces for rat sign.

#### **Run a Rat-free Boat**

- When tying up in port, look for ways rats could board your boat, and take steps to stop them. Rats are excellent climbers, jumpers, and swimmers.
- Use rat guards on tie-up lines where appropriate.
- Because rats are nocturnal, night lighting on gangways and ramps can discourage their use.
- Seal entry points to your vessel’s interior, such as cable chases, and put screens or louvers over windows and vents.
- Inspect and shake out fishing nets and lines before taking them aboard. Rats like to nest and shelter in trawl and seine nets and coils of ground line. Most gear storage facilities do NOT have rat control programs. Soap does not work to protect stored nets from rat damage.
- Inspect cargo for rat sign. Rats can hide in containers and in pallets.

#### **Kill Rats that Get Aboard**

- Learn more about rat identification and environmental impacts from rats on the [ADF&G Invasive Species — Norway Rat \(\*Rattus norvegicus\*\)](#) web page.
- When tied up in rat-infested ports, deploy traps or poison bait stations near any possible spot a rat could board.
- Use multiple approaches. Deploy snap traps, sticky boards, and poison. Put traps where rat sign is found, in dark and concealed spaces, and near food or garbage.
- Use fresh bait and be patient. Rats are wary of new items in their environment and often will not take bait for days or even weeks after it is introduced.
- If you catch one rat, do not assume it is the only one. Re-deploy traps.
- As a last resort you may need to have the vessel fumigated.
- Never throw a live rat overboard. They are strong swimmers and may reach land.

#### **Speak Up and Spread the Word**



Step 1: Be Prepared

**Tool 1.4. Response Materials**

A baseline stock of the following items should be maintained:

- Victor snap traps with metal triggers (the yellow treadle traps have an action that requires too much force to trigger the trap).
- TRex snap traps
- Chew blocks
- A single make and model of bait station. The bait stations should be of a single design, with the same keyed access design, and sized such that they can support a lethal trap inside of the bait station as well as a chew block or a rodenticide block.
- Trail cameras to be used for verification steps.

The ADF&G has also compiled a comprehensive list of materials that may be included in response kits. While the items suggested by ADF&G are tailored for shipwreck response, many items are also appropriate for use in inhabited coastal areas, with the exception that open-ended bait stations are not appropriate for use in inhabited areas. Additionally, ADF&G recommends including rodenticides in response kits. **However, rodenticides should NOT be included in staged materials and only purchased as necessary.**

[See Table F-1 in Fritts EI. \(2007\). Wildlife and People at Risk: A Plan to Keep Rats Out of Alaska. Alaska Department of Fish and Game. Juneau Alaska. 190 pp.](#)

### Step 2: Report and Verify

#### □ **STEP 2: REPORT AND VERIFY SIGHTING**

This step outlines the process to report a sighting of suspected invasive rodents and verify the species identity. This step also provides direction for initial actions to take in the event of a rat spill. Take these actions immediately after the rodent or rodent sign is observed or a potential rat spill has been reported.

#### **Step 2 Strategic Tasks**

- 1) Report sighting of rodent or rodent sign immediately.
  - a) A sighting may consist of observing a rodent or rodent sign (feces, chewed food or detection blocks, observation of nests, burrows, or obvious rodent runways) made in a suspected rodent-free area.
  - b) Due to the severe damage that may be caused by invasive rodents, any observation of suspected rodents or rodent sign should be reported—even in areas where native rodent/small mammal species occur. Further efforts will then be pursued to confirm species identity.
  - c) Reports of sightings made on or near Service lands, or by Service staff, should be made immediately to the local Refuge/FWCO manager and to the Regional Invasive Species Program Coordinator or to one of the Sub- Regional EDRR Project Managers, see [Tool 2.1](#).
  - d) Report sightings of rodents not on Service lands to the ADF&G Invasive Species Program Coordinator (see [Tool 3.1](#)) or through the Alaska Invasive Species Hotline 1-877-INVASIV (468-2748).
- 2) Verify sighting
  - a) Take photos of rodent sign. [Tool 2.3](#) provides detailed instructions for completing inspections for rodent sign, though this information is particularly relevant to inspections inside buildings.
  - b) Rats may avoid traps due to trap shyness or neophobia (avoiding new materials placed into their environment), so passive techniques like trail cameras, tracking baits, and tracking powders may be more effective for rapid verification of the presence of rodents. These should be placed in areas with high potential for rodent activity.
  - c) To verify species, animals must be trapped. If rodents are captured or if carcasses are found, they should be safely collected and stored according to the guidelines established by the National Wildlife Health Center. Contact the Service Invasive Species Program Coordinator ([Tool 2.1](#)) for specific shipping instructions. Guidelines provided in [Tool 2.4](#).
  - d) In remote or uninhabited locations, verification may be concurrent with [Step 4](#), Assessment.
- 3) Once the presence and species identity has been confirmed, report the verified sighting to relevant landowners and communicate with the Regional Invasive Species Program Coordinator. Then, report via the ADF&G online reporting system, as outlined in [Tool 2.5](#) if not already complete. In many cases, this action may need to occur following [Step 4](#).

**In the case of a rat spill do the following (see [Tool 2.2](#) for additional guidance):**

- 1) The United States Coast Guard (USCG) has the primary jurisdiction of management of disabled ships regardless of location. The Service's Alaska Region Spill Response

**Step 2: Report and Verify**

Coordinator is notified of all disabled vessels in Alaska waters, regardless of location.

- a) The Service Alaska Region Spill Response Coordinator will notify specific Refuge staff as well as the Service Invasive Species Program Coordinator if the ship poses risk of rodent introduction (if the ship is near Refuge lands, or could drift or be towed near to Refuge lands).
- b) Stricken vessels should be examined for rats, if possible and safe to do so. Response vessels or aircraft could also inadvertently transport rats to rat-free areas, and they should be examined for rats before deployment (Alaska Regional Response Team Wildlife Protection Committee 2020).
- c) If it is not possible to conduct onboard rat inspection and prevention activities for either a stricken vessel or a response vessel, Service and ADF&G representatives will develop an incident-specific rat prevention plan for approval by the Spill Response Coordinators. The plan should include, but not be limited to, the deployment of rat trap and poison stations in appropriate locations on the vessel and the island, names of individuals authorized to deploy and monitor the stations, and a station monitoring plan (Alaska Regional Response Team Wildlife Protection Committee 2020).

**Step 2 Roles and Responsibilities**

- Personnel in inhabited locations should be able to verify the species, although a Rapid Response Team may assist (concurrent with [Step 4](#), Assessment).
- The Regional Invasive Species Program Coordinator and Sub-Regional EDRR Project Manager(s) will work closely with Refuge and FWCO staff to assist in verification and inform additional partners of the presence of rodents.
- In a potential rat spill scenario, the Regional Spill Response Coordinator will work closely with the Regional Invasive Species Program Coordinator and EDRR Project Managers. The Spill Response Coordinator will be responsible for communicating plans with the USCG and other spill response partners.

**Step 2 Tools**

**Tool 2.1. Service Contact Information**

Role	Name	Contact Info
Regional Invasive Species Program Coordinator	Aaron Martin	aaron_e_martin@fws.gov Cell: (907) 378-0568 Office: (907) 786-3510
Sub-Regional EDRR Project Manager (interior and northern Alaska)	Lisa Dlugolecki	lisa_dlugolecki@fws.gov Cell: (907) 251-5959 Office: (907) 455-1840
Sub-Regional EDRR Project Manager (southcentral/southwestern Alaska)	Ben Wishnek	benyamin_wishnek@fws.gov Cell: (907) 251-0692
Regional Integrated Pest Management (IPM) and Spill Response Coordinator	Angela Matz	angela_matz@fws.gov (907) 786-3483

Step 2: Report and Verify

**Tool 2.2. Alaska's Rat Spill Response Program**

[Ebbert, S., A. Sowls, and V. Byrd. 2007. Alaska's Rat Spill Response Program.](#)

**Tool 2.3. Guidelines for Rodent Surveillance Techniques**

[The Pacific Invasive Initiative has put together this: "Resource Kit for Rodent and Cat Eradication"](#). This document provides thorough detail about trapping, baiting, and other techniques that can be used to assess the presence of rodents and facilitate species identification.

**Tool 2.4. National Wildlife Health Center Guidelines for Collecting Specimens**

[The USGS National Wildlife Health Center has established guidelines for safely collecting and shipping specimens.](#) Follow these instructions for collecting rodent specimens. However, contact the Service Invasive Species Program Coordinator for specific shipping instructions.

**Tool 2.5. ADF&G Invasive Species Reporting Form**

[Click this link to report a mammal observation.](#)

Include information regarding: the species observed, the number of animals observed, the area of coverage, the life stage observed, the date of observation, and a detailed description of the location observed. Also upload any photos taken to the online report.

### Step 3: Form Response Team

#### □ **STEP 3: FORM INCIDENT RESPONSE TEAM**

Due to the risk posed by invasive rodents, any verified sighting of these species in a known rodent-free area will initiate rapid response actions. Upon verification, a designated Incident Response Team will be assembled to determine the appropriate course of action and enact the response. This step provides guidance for assembling this team. Due to overlapping authorities and limited capacity for any one agency to address invasive species efforts statewide, a successful response will benefit from including multiple partners.

#### **Step 3 Strategic Tasks**

- 1) Identify key partners to form the response team ([Tool 3.1](#)).
  - a) The response team should directly include or closely communicate with any private entities such as harbor or fish plant staff, any facility tenants or users, local city administration, and any federal or state agencies that use a location where a rodent has been sighted.
  - b) Identify experts that can provide insight into the response. Experts from Refuges or FWCOs that have a history of completing rodent response (such as Alaska Maritime National Wildlife Refuge) can be especially helpful. The Regional Office can facilitate identifying these experts.
  - c) The United States Department of Agriculture Animal and Plant Health Inspection Service, Wildlife Services Department (USDA APHIS) can also provide leadership and expertise in regards to rodent response. They have trained, certified personnel to detect rodents, set traps, and apply pesticides.
  - d) ADF&G should also be involved on the response team, or kept in close communication. Communication with ADEC should be initiated prior to performing any activities that may include the use of rodenticides.
- 2) Assign leadership, define roles and responsibilities.
  - a) The rapid response process will be most successful if local responders (e.g., Refuge or FWCO Biologists/Managers, etc.) take ownership and direct actions. These people may not necessarily be from the Service, depending on the location of the infestation. Guidance for the minimum leadership roles that should be identified are listed in [Tool 3.2](#). Other partners may be involved but may not have defined roles or additional roles can be identified to reflect specific circumstances.

#### **Step 3 Roles and Responsibilities**

- Service Alaska Regional Invasive Species staff can help identify or contact additional partners that should be involved.
- If rodents are found in inhabited areas, representatives from villages, communities, and municipalities should also be closely communicated with and involved in the response.
- In the case of a potential rat spill, the Incident Response Team will communicate plans to the USCG through the Service's Spill Response Coordinator.
- Refuge or FWCO staff may still want to engage in a response off Refuge if the incident threatens Refuge lands or resources.



Step 3: Form Response Team

**3) Public Communication Officer**

The public communication officer(s) should deliver timely and consistent messages to the public and to the media. This individual should coordinate among agencies, as it is essential to use consistent messages when dealing with the public. Contradictory or conflicting messages weaken public faith in agency actions and decision making. The public communication officer(s) should be a member of the lead agency.

**Name:**

**Agency:**

**Contact Information:**

This position may be filled by:

Service External Affairs or respective program outreach staff

### Step 4: Risk Reduction and Situation Assessment

#### □ **STEP 4: RISK REDUCTION AND SITUATION ASSESSMENT**

The assembled team should now work together to implement immediate actions that will reduce the risk of rodent spread while the situation is further assessed. This step provides resources to reduce risk, and also provides a framework for gathering the information needed to inform the actions outlined in [Steps 5-7](#).

#### **Step 4 Strategic Tasks**

- 1) Complete the situation assessment ([Tool 4.1](#)). Field survey efforts, such as those outlined in [Tool 2.3](#) will be needed to complete the situation assessment. These efforts may be taken in conjunction with verification actions outlined in [Step 2](#).
- 2) Take risk reduction actions such as:
  - a) In the event of a rat-spill, indicator (non-toxic) baits interspersed with traps can be used where rodents are predicted to come ashore.
    - i) If there is concern that non-target native species could be captured in snap traps, live [Tomahawk](#) (for rats) and [Sherman](#) (for mice) traps are non-lethal alternatives. Placing snap traps and indicator baits within protective stations can also limit non-target captures.
    - ii) After indicators are deployed over likely pathways of invasion, additional traps may be deployed in areas less likely to be invaded.
    - iii) Rodents exhibit neophobia and will avoid novel things in their environment. Similarly, they will quickly learn to avoid traps if they are trapped and then escape. Consider pre-baiting for several days (that is, placing baited but unset traps into the environment). The traps can be activated after an acclimation period to increase trap success.
  - b) In human inhabited areas, take additional actions to prevent further spread of rodents, including:
    - i) Install defensive trapping stations (biosecurity barrels/plywood cubes or boxes). [Tool 1.4](#) has additional detail about defensive trap stations for Alaska conditions.
    - ii) Rodent-proof buildings.
    - iii) Require placement of rat guards on ship mooring and service lines.
    - iv) Require inspections of nets, pots, lines, etc. on boats prior to loading onto vessels or storing. Take similar actions for planes.
    - v) Further detail regarding these, and other efforts that can limit rodent spread, particular to waterfronts, can be found in [Tool 1.4](#).
- 3) Identify additional partners for response. Once the full extent of the situation is understood, additional partners to aid in the response may be added to the incident response team.
- 4) Communicate with the public (see additional details in Roles and Responsibilities).

#### **Step 4 Roles and Responsibilities**

- The Response Plan Coordinator will lead the situation assessment.
- Once the infestation is understood, the Public Communication Coordinator should consider working with the agencies' External Affairs Program to develop a press release and/or hold a public meeting outlining the information that is known. The local community should be actively involved in a response.
- At this step, a full response plan need not be developed, but the public should be aware that actions are being considered.



Step 4: Risk Reduction and Situation Assessment

Step 4 Tools

**Tool 4.1. Situation Assessment**

The following assessment provides a general outline which can be used to condense information to facilitate communication among partners during Steps 5-7. The information collected in this situation assessment is the minimal amount of data needed to inform an effective response plan:

- 1) **Identify the geographic extent and size of the infestation.** It may not be possible to determine the exact size of an infestation, but efforts should be made to understand the relative scope (e.g., one or few animals, or is there evidence of a breeding population).
  - Search areas for rodent sign, focusing on areas with harborage (e.g., junk piles, debris) or food storage.
  - Thermal imaging scopes may be used to scan buildings for infestations.
  - Indicator baits, tracking powder, glue boards, etc., can be used to identify runways or areas of rodent harborage.
- 2) **Identify locations of additional suitable habitat.** Mapping out the current estimated location of an infestation as well as nearby areas suitable for rodent harborage can help identify locations where bait stations or traps should be placed.
- 3) **Identify the agencies/businesses/Native Alaska organizations that may be associated with response.** If an infestation is detected in a harbor/port, etc., all owners and operators within the area will likely need to be involved in a response and possibly the broader community. If an infestation is located in an uninhabited area, any land managing agencies in the area of the detected infestation will need to be involved.
- 4) **Interview all personnel to determine locations of sightings of rodents or rodent sign.** Interviewing users of facilities when warranted can help identify the areas of infestation and may also lend insight into the original source of the infestation (e.g., if there were recent shipments from areas harboring known infestations of rodents).
- 5) **Determine the extent of human access and use.** Note the presence of pathways for potential spread to identify additional actions that could reduce risk of further spread via these pathways.
- 6) **Determine whether there is a need for law enforcement action or if any additional form of investigation is needed.**
- 7) **Determine additional location specific risk factors or impacts that should be considered in this location.** Factors to consider include: subsistence use, presence of other invasive species, species listed under the Endangered Species Act, infestation located in federally designated Wilderness.

### Step 5: Evaluate Response Options

#### □ **STEP 5: EVALUATE RESPONSE OPTIONS**

In this section we outline a number of treatment options available to pursue eradication of founding populations of invasive rodents, and emphasize that for Service-led responses, an adaptive [Integrated Pest Management](#) (IPM) approach is the preferred strategy. However, if it is determined in the previous steps that an established breeding population of rodents exists, complete eradication may require longer-term planning outside the scope of rapid response. If this is the case, rapid response actions should still be taken to limit spread and otherwise reduce risk while additional planning efforts are made.

#### **Step 5 Strategic Tasks**

- 1) Identify the response options relevant to the given circumstance.
- 2) Select among response options ([Tool 5.1](#) and [Tool 5.2](#) will facilitate this task).
- 3) Consider any special circumstances of the infestation. For example, if an infestation is located in federally designated Wilderness, or in an area with species listed under the Endangered Species Act, additional steps are required ([Tool 5.3](#)).
- 4) Continue to re-affirm roles and responsibilities and work together with partners when making decisions. Ensure that the appropriate agencies, such as ADEC are consulted if pesticides will be used in a response.

#### **Step 5 Roles and Responsibilities**

- The selection of the response options should be led by the Response Plan Implementation Coordinator, but will be made together with the response team. The Central Communication Coordinator will communicate the final decision among members of the team and partners.
- If the Service Regional Invasive Species Program Coordinator/EDRR Program Managers are not actively involved in the response efforts, it is the duty of the Central Communication Coordinator to update them of progress and keep them regularly informed of resources needed.
- In the event of a rat spill scenario, the Service Spill Response Coordinator will communicate with the United States Coast Guard regarding any efforts that will be taken to address rodents.

#### **Step 5 Tools**

##### **Tool 5.1. Invasive Rodent Response Options**

Sanitation and rodent-proofing work together to enhance the effectiveness of trapping and baiting; all are components of an integrated rodent management program. Removing food sources and restricting rodent access forces rodents to roam farther away from their nests in search of food, making their contact with rodent traps and baits more likely.

#### **Sanitation/Cultural Control Measures**

These methods alone will not be sufficient for rodent eradication. Sanitation methods can be used to limit rodent damage in human occupied areas, and may help to prevent them from encroaching into areas with high potential for spread. These methods are not relevant in areas without human occupation.

- Seal any openings greater than 1/4 inch in diameter in foundations, walls, and roofs. Place screen over vents and install door sweeps to prevent access. If rats are entering

### Step 5: Evaluate Response Options

through floor drains, seal these with hardware cloth with mesh smaller than 1/2 inch.

- Install heavy-gauge kick plates at the base of any doors with evidence of rodent gnawing.
- Remove or trim ground cover and other landscape plants to expose ground and discourage rodent travel ways and rat burrowing. Avoid landscaping that creates ideal habitat for burrows including stone walls with unsealed gaps. Remove mulch from building foundations to reduce harborage. Do not allow grass clippings or leaf litter to accumulate adjacent to school buildings.
- Place exterior trash cans and dumpsters away from building entrances to avoid attracting rodents to building. Use exterior trash receptacles with tight-fitting or spring-loaded lids. Use self-contained, leak-proof compactors instead of dumpsters. Empty exterior trash receptacles daily at the end of each day.
- Fix plumbing leaks and improve drainage to prevent water accumulation near the building. Clean gutters to prevent water retention.
- Remove debris, clutter, or stored materials from the building exterior and adjacent areas to reduce harborage and permit proper cleaning and inspection. Remove clutter and items stored on floors in interior entryways, storage, and other areas to reduce harborage and allow for proper cleaning and inspection.
- Place nontoxic monitoring bait blocks in tamper-resistant stations in non-visible, inaccessible areas and check regularly for feeding.
- Visually inspect vulnerable areas often (e.g., food service, custodial closets, laundry rooms, vending areas, garages, under sinks, sill plates, crawlspaces) for droppings or grease marks.
- Clean up droppings, grease marks, and urine promptly using water and approved disinfectants. Wear proper personal protective equipment during cleanup.
- Fill in inactive burrows with appropriate filler such as mortar for burrows in or under concrete and soil.

A thorough guide for sanitation and exclusion measures can be found here:

[Badzik, B., C. L. J. DiSalvo, D. E. Buttke, and M. F. Chase. 2014. Rodent Exclusion Manual, Mechanical Rodent Proofing Techniques: a Training Manual for National Park Service Employees. Natural Resource Report September 2014. National Park Service, Fort Collins, Colorado.](#)

### Physical/Mechanical Control Measures

Snap traps, repeating catch-all devices, and live traps, are all considered physical/mechanical controls for rodents. As with any IPM program, selection of the best methods for trapping needs to occur after careful inspection, species verification, and assessment of the situation. Trapping does not use rodenticides, and trapped rodents must be regularly discarded. Trapping can provide a reasonable means of initially assessing the size and characteristics of a rodent population.

#### *Glue boards*

Glue board traps consist of a sticky film of glue applied to a backing of cardboard, wood or plastic. The glues do not harden but will hold a rodent in place. Other rodents become curious and also get caught. Placing a small piece of food bait in the center of a glue board can increase effectiveness.

The use of glue traps (glue boards) should be limited. When used as part of control or eradication efforts, glue boards should always be combined with other methods. These traps can

### Step 5: Evaluate Response Options

fail when they get dirty, or can get too hot or cold. Additionally, they can easily capture non-target species, and this should be thoughtfully considered before they are used. To help keep them free of dirt and moisture, glue trap covers can be used. Alternatively, the traps can be placed in boxes with openings, or in empty bait stations to keep them clean. Even with these precautions, however, savvy rodents will avoid them, vault over them or place debris on them to cover the sticky surface. Some people consider the glue board to result in inhumane deaths of rodents (i.e., through dehydration or starvation).

#### *Snap Traps and Multiple Catch Traps*

Traps are most useful against mice, because mice tend to be curious and rats suspicious. For mouse control in public buildings, snap traps and multiple-catch traps can be used. One multiple-catch trap can trap a dozen or more mice without the use of rodenticide/poison bait.

Captured mice or rats should never be released alive to the outdoors. Unlike snap traps, multiple-catch traps are not useful against rats. The best all-around trap for both mice and rats is the snap trap (or break-back trap). Modern snap traps have expanded plastic triggers proven to catch more rodents than older traps with smaller, metal triggers. The Victor Professional kill trap has been highly recommended in the past (New Zealand Department of Conservation 2002) but may be best suited for household, warehouse, and community use.

Other brands have been found more reliable; these include traps primarily made of plastic, for use in protective stations (Dunlevy and Scharf 2007). A newly developed “reverse-bait trigger” trap by Ka Mate Limited appears well suited to use in outdoor or other heavy-use settings in Alaska because it is less prone to misfires (e.g., from jostling or shipboard vibration) or to trapping of animals such as birds. Made of aluminum, it is particularly durable and can be bolted into place (excerpted from Fritts 2007).

Although snap traps are effective in many situations, they are generally too labor-intensive and time-consuming to be practical against large infestations of rodents. Half a dozen snap traps will capture a couple of mice in someone’s kitchen, but two dozen may be required for a typical restaurant storage room, and many more are needed in a warehouse. Since mice travel only 3-9 meters (10-30 feet) but rats travel 30.4–45.7 meters (100-150 feet) from harborages, more traps are needed to trap mice than rats in a structure. Snap traps should be placed at 3-meter (10-foot) intervals for mice and at 6-meter (20-foot) intervals for rats. Both types of rodents are used to human odors so there is no need to use gloves when handling unbaited traps or traps baited with non-toxic (e.g., food) baits.

#### *Runway traps*

Designed to catch rats when they accidentally bump the trigger, runway traps are available commercially or can be made from snap traps by enlarging the trigger with cardboard, hardware cloth, paperclip, or screening. There is no bait to go stale, so there is an increased chance of success.

#### *Live Traps*

Live traps are not preferred, because trapped rodents must be humanely euthanized. However, if checked regularly, they can reduce the risk of non-target effects since animals are not killed when entering the traps.

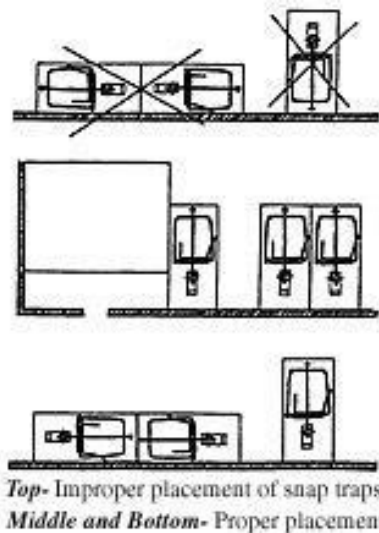
#### *Trap Placement Considerations*

Rats and mice have different behaviors around new objects. Mice are curious and will normally approach traps the first night. If you do not catch a mouse in the first few nights, the

### Step 5: Evaluate Response Options

trap is in the wrong location. Whether baited or not, it is important to place traps where the rodents are, and to consider innate rodent attributes and behaviors. “Think like a rat” when picking optimum locations for placement of treatment devices, particularly traps; as appropriate, use a tracking powder (flour, talc) to pinpoint the best places along suspected runways to place traps.

Because rodents tend to run along walls, it is important to place snap traps perpendicular to the wall (i.e., at right angles to rat runs), with the trigger end against the wall. Also place traps in areas of food, garbage, and freight storage, and near holes; set traps where children and pets will not be hurt. They can also be placed in tandem (back-to-back), parallel to the wall, so that rodents traveling in either direction will encounter the triggers. Be sure to set all traps to kill: escapees learn to avoid and may teach their young. Regularly check the traps to make sure they are set, in good condition, and that any food or rodenticide baits used are fresh. Moldy bait is less effective. For examples of correct and incorrect placement of snap traps, see the figure below:



**Figure 5.1. Correct placement of traps: improper (top) and proper (middle and bottom)**

#### *Trap and Bait Shyness*

Neophobia makes rats hesitant to approach new items such as traps or bait placed into their environment. Rats may ignore newly-placed rodent bait and traps for days or even weeks, particularly if other food continues to be routinely available. Allow rats to overcome trap shyness by placing traps unset, in place, for several days. This results in better catches. Especially for food or non-toxic baits, thwart bait stealing by using dental floss or a twist-tie to tie baits onto snap trap triggers.

#### *Trap Baiting (Non-toxic baits)*

Traps are usually effective when dealing with small numbers of rats or mice. Although unbaited snap traps do catch rodents, they work best when baited with food the rodents find attractive. The food bait must compete with other available foods, so no single food bait is ever the best bait for all locations. Rodents living on garbage or spoiled food prefer something fresh. Following are some food baits that have proven successful for rodents:

- Whole nuts for rats and mice.

### Step 5: Evaluate Response Options

- Raisins or grapes for roof rats.
- Sardines packed in oil, or sponges soaked in herring oil, for Norway rats.
- Peanuts or peanut butter for rats and mice (soak whole peanuts in water overnight; old peanut butter becomes rancid so replace it frequently).
- Dry oatmeal is excellent for mice. For rats and mice, oatmeal or rolled oats can be made into a paste by mixing with peanut butter.
- Bacon squares, hot dogs, and sardines
- Small wads of cotton (e.g., cotton balls) for mice and rats (desired as nest material).
- Gumdrops for mice
- Especially if trapping rodents in an outdoor setting, it is important to adapt food bait locally.

#### *Trap Pre-baiting*

Another strategy is to pre-bait snap traps without setting them. Pre-baiting allows rats to adjust to the presence of traps and begin feeding on the food bait. Once routine feeding occurs, the triggers can be set. The object is to maximize the number of rodents caught and minimize the number of escapees. This is important for overall success because “experienced” individuals may train others to avoid poison-contaminated food, or they may transfer their wariness to nontoxic foods of similar types. This type of bait shyness can persist for weeks or months. An attractant that is similar to the intended bait can be sprinkled on unset traps or in unbaited bait stations during the “pre-bait period”; examples include herring oil if herring oil-soaked sponges will be the bait, or a mixture of peanut oil and rolled oats if a sticky mix of peanut butter and rolled oats is planned as bait (Dunlevy and Scharf 2007).

### **Chemical Controls**

#### Rodenticides (Toxic Baits)

Chemicals used to track or control rodents may require specific certifications and training before they can be applied, and specific record keeping. Requirements depend on: 1) Whether the applicator is an employee of a privately owned facility like fish processing plants or private marinas, or a government employee; and 2), which chemical is being used and whether it is considered “restricted use.”

Under Alaska law ([18 AAC 90.300. Certification requirements](#)) anyone who “engages in custom, commercial, or contract application” of any pesticide, or supervises the use of a pesticide, on property other than that belonging to the person or his/her employer, must have current state certification, or work under the supervision of someone who does.” Therefore, employees of privately owned facilities like fish processing plants and private marinas currently can use non-restricted pesticides without certification; they cannot use restricted pesticides without certification. Employees of municipal, state, or federal ports or harbors, or of commercial facilities that are open to public use, must be certified.

All products purchased and used must be registered for that use by the Environmental Protection Agency (EPA) and the State of Alaska, regardless of who uses them. It is a violation of federal law to use any pesticide in violation of label instructions. More information on pesticide labels can be found here: <https://www.epa.gov/pesticide-labels>. There may also be posting, pre-notification, storage, and disposal requirements. Check with the ADEC Pesticide Program office at 1-800-478-2577 for details.

A “restricted use” pesticide (RUP) is one that has been determined to have the potential

### Step 5: Evaluate Response Options

to cause unreasonable adverse effects to the environment and injury to applicators or bystanders without added restrictions. Certain rodenticide formulations are RUPs. The "Restricted Use" classification restricts a product, or its uses, to use by a certified applicator or someone under the certified applicator's direct supervision. RUPs are not available for purchase or use by the general public. [See detailed information on the restricted use classification in 40 CFR 152.160 – 152.175.](#)

Toxic baits used to control rodents are formulated with an attractant (generally food) plus rodenticide (toxin). Changes in rodenticide regulations went into effect in mid-2011 in an effort to prevent rodenticide hazards to wildlife and pets and to reduce accidental exposure to children. These federal EPA restrictions now permit manufacturers to produce, for sale to the general public, only wax block, gel, or paste rat and mouse baits that are packaged in ready-to-use, disposable bait stations. Agricultural producers and professional pest control personnel are able to obtain more types of rodenticides in various formulations, some of which are RUPs.

#### *Anticoagulant Rodenticides*

Anti-coagulant rodenticides kill by preventing blood from clotting. When these were first developed and marketed, children and pets were able to ingest them, resulting in injury and death. Different packaging helped solve this problem - now the only way first generation anticoagulants can be used in the consumer market are ready-to-use bait stations that contain or are packaged with rodenticide bait that is in block or paste form. This means if you were to go to your local hardware store, you would find this product in one large container and there is no easy way for children or pets to tamper with it. This product must be placed inside tamper resistant containers within 100 feet of buildings and other structures and only registered Pesticide Applicators can purchase the rodenticide in containers of 4 pounds or more.

**First-generation anticoagulants**, the best known of which is warfarin, require multiple doses, and some rodent populations have developed genetic resistance to warfarin. Warfarin is no longer used by professional pesticide applicators but may be the active ingredient of some low-cost rodenticides available to consumers. Diphacinone and chlorophacinone are other commonly used first-generation anticoagulants.

**Second generation anticoagulants** were created after some rodent populations became resistant to the first generation products. These act faster; in some cases, a single feeding can result in death. Second-generation anticoagulants are also more dangerous to children, pets, and non-target organisms like native small mammals. These products can only be purchased for commercial pest control and structural pest control markets. Products containing second-generation anticoagulants must be sold in containers holding at least 16 pounds of bait if they are labeled for use by professional applicators and at least 8 pounds of bait if labeled for use in or near agricultural structures. These registered baits are for use by professional applicators to control rats and mice in or within 100 feet of buildings and other structures or for use in and near agricultural buildings and man-made agricultural structures.

Anticoagulants have the same effect on nearly all warm-blooded animals, but the sensitivity to these toxicants varies among species with larger animals generally requiring a larger dose of toxicant than smaller animals. Dogs are more susceptible to anticoagulant poisoning than are many other mammals, and small to medium-sized dogs that seek out and consume rodents or rodent carcasses could be at greatest risk. Symptoms of anticoagulant

### Step 5: Evaluate Response Options

poisoning in mammals include lethargy, loss of color in soft tissues such as the lips and gums, and bleeding from the mouth, nose, or intestinal tract. Vitamin K1 is the antidote for anticoagulant rodenticides, although in cases of severe poisoning, whole blood transfusion is also used.

#### *Other Rodenticides*

Non-anticoagulant rodenticides include bromethalin, cholecalciferol, and zinc phosphide (products with cholecalciferol and zinc phosphide are classified as restricted use by the EPA). Although not anticoagulants, application directions for bromethalin and cholecalciferol are somewhat similar to those for anticoagulant rodenticides. These two materials are formulated to serve as chronic rodenticides so that rats will have the opportunity to feed on exposed baits one or more times over a period of one to several days. Bait acceptance is generally good when fresh, well-formulated products are used.

Zinc phosphide differs in that it is an acute toxicant that causes death of a rodent within several hours after a lethal dose is ingested. Because zinc phosphide baits often require pre-baiting to get adequate bait acceptance (offering rats similar but nontoxic bait before applying the zinc phosphide bait), it is not commonly used against rats and is infrequently available to consumers. An advantage of zinc phosphide bait is its ability to achieve a comparatively quick reduction of a rat population, and for this reason pest control personnel and agricultural producers sometimes favor it.

While risk of secondary poisoning to predators and scavengers is low because of the mode of action of these three rodenticides, a primary hazard to non-target animals (i.e., pets, domestic animals, and wildlife) that may consume rodent baits can occur when required precautions regarding bait placement are not followed.

[For more information about rodenticides check out the National Pesticide Information Center website.](#) Always read and follow the label. The label is the law. Pesticides must be used in accordance with federal, state, and local regulations. Applicators must have proper credentialing to apply pesticides and should always wear personal protective equipment as required by the pesticide label during applications. All labels and Safety Data Sheets for the pesticide products should be maintained on file.

#### *Bait Placement and Bait Stations*

All toxic rodenticide baits must be used carefully according to the label directions, which have become more specific and more restrictive. Some baits must be contained within bait stations for all outdoor, above-ground applications. In addition to increasing the safety of the bait, bait stations also help the rats feel secure while feeding. Place all bait stations in rat travel ways or near their burrows and harborage. Do not expect rats to go out of their way to find the bait. For Norway rats, place bait stations near rodent burrows or suspected nest sites, against walls, or along travel routes. For roof rats, place baits in elevated locations, such as in the crotch of a tree, on top of a fence, or high in a vine. If you place bait stations above ground level, take care that they are securely fastened and will not fall to the ground where children or pets could find them. Because rats often are suspicious of new or unfamiliar objects, it might take several days for them to enter and feed in bait stations.

Place fresh bait in these stations to control invading rats before populations become established. For best results, make sure there is a continuous supply of bait until feeding stops. With the first-generation anticoagulant baits, it usually takes 5 or more days, once the rats start



### Step 5: Evaluate Response Options

feeding, for them to die. Check bait stations regularly and replace bait if it gets old or moldy, because rats won't eat stale bait.

Baits and bait stations now have more restrictive regulations regarding locations for use. Different designs of commercially manufactured bait stations may be required, depending on the particular situation and the bait formulation used. For example, some labels state "tamper-resistant bait stations must be used if children, pets, nontarget mammals, or birds may access the bait." Certain prepackaged bait stations intended for sale to homeowners can be used only inside structures and are prohibited for use in any area accessible to pets or outdoors. Other baits or bait stations may also be used around the periphery of structures or within 50 feet of a structure. Because rats may not travel far from their shelter to find food, many product labels suggest making bait placements at 10- to 30-foot intervals. Place bait boxes next to walls (with the openings close to the wall) or in other places where rats are active. In all cases, the user must follow label directions. Remove and properly dispose of all uneaten bait at the end of a control program. In addition, collect and properly dispose of any dead rodents found during the course of a rodenticide application.

All information in this section excerpted and modified from:

[University of California Agriculture and Natural Resources Program Johnson. 2008. Rat Control for Alaska Waterfront Facilities.](#)

and

[Fritts, E. I. 2007. Wildlife and People at Risk: A Plan to Keep Rats Out of Alaska. Alaska. Department of Fish and Game. Juneau Alaska. 190 pp.](#)

Step 5: Evaluate Response Options

**Tool 5.2. Response Options Decision Template**

**1) Examine all feasible response options:**

Based on the information gathered in the site specific assessment, list all feasible response actions:

Examples of potential actions to consider include, but are not limited to:

- Chemical controls
- Containment
- Mechanical controls
- Outreach/education

**2) Decision making: comparing options**

Compare all feasible options according to the response criteria listed in the first column of this table. Add more pages as necessary.

Criteria	Response Option 1	Response Option 2	Response Option 3
What resources would be needed to implement this strategy?	<input type="checkbox"/> Personnel <input type="checkbox"/> Pesticides and applicators <input type="checkbox"/> Transportation <input type="checkbox"/> Funding <input type="checkbox"/> Other	<input type="checkbox"/> Personnel <input type="checkbox"/> Pesticides and applicators <input type="checkbox"/> Transportation <input type="checkbox"/> Funding <input type="checkbox"/> Other	<input type="checkbox"/> Personnel <input type="checkbox"/> Pesticides and applicators <input type="checkbox"/> Transportation <input type="checkbox"/> Funding <input type="checkbox"/> Other
List any other resources that may be needed to address this infestation			
Of the needed resources, which are readily available?			
Provide a cost estimate for this response option.			
Do any regulations or permitting restrictions apply to this action?			
How feasible is it to meet your response objectives using this response option?			
What precedents exist for using this methodology?			

Step 5: Evaluate Response Options

**Tool 5.2. Special Considerations for Federally Designated Wilderness**

The Wilderness Act of 1964 established the National Wilderness Preservation System (Wilderness hereafter), which today has grown to more than 104 million acres, approximately half of which (~57 million acres) are located in Alaska. The Service manages 21 designated Wilderness areas totaling approximately 18.6 million acres on 10 Refuges units in Alaska.

**Table 5.3.** Wilderness areas managed by the Service in the Alaska Region.

<b>WILDERNESS AREA</b>	<b>SIZE (ACRES)</b>	<b>REFUGE UNIT</b>
Aleutian Islands (1980)	1,300,000.00	Alaska Maritime NWR
Bering Sea (1970)	81,340.00	Alaska Maritime NWR
<u>Bogoslof</u> (1970)	175.00	Alaska Maritime NWR
Chamisso (1975)	455.00	Alaska Maritime NWR
Forrester Island (1970)	2,832.00	Alaska Maritime NWR
Hazy Islands (1970)	32.00	Alaska Maritime NWR
Semidi (1980)	250,000.00	Alaska Maritime NWR
Simeonof (1976)	25,855.00	Alaska Maritime NWR
St. Lazaria (1970)	65.00	Alaska Maritime NWR
Tuxedni (1970)	5,566.00	Alaska Maritime NWR
Unimak (1980)	910,000.00	Alaska Maritime NWR
Mollie Beattie (1980)	8,000,000.00	Arctic NWR
Becharof (1980)	400,000.00	Becharof NWR
Innoko (1980)	1,240,000.00	Innoko NWR
Izembek (1980)	307,981.76	Izembek NWR
Kenai (1980)	1,354,247.00	Kenai NWR
Koyukuk (1980)	400,000.00	Koyukuk NWR
Selawik (1980)	240,000.00	Selawik NWR
Togiak (1980)	2,270,799.00	Togiak NWR
Andreafsky (1980)	1,300,000.00	Yukon Delta NWR
Nunivak (1980)	600,000.00	Yukon Delta NWR

### Step 5: Evaluate Response Options

The Service has [developed guidelines](#) for addressing invasive species in Wilderness areas. **Section 2.19** of the guidelines states the following:

“May the Service control invasive species, pests, and diseases in Wilderness?”

The Service will follow an IPM approach to prevent, control, or eradicate invasive species, pests, and diseases subject to the criteria in section 2.16 (also see the Refuge program’s biological integrity policy at 601 FW 3.16 for detail about managing non-native species to maintain and restore biological integrity, diversity, and environmental health). The Service will determine appropriate IPM procedures through a Minimum Requirements Analysis (MRA) and document them in the Refuge’s Wilderness Stewardship Plan (WSP). If the approved IPM plan determines that chemical or biological treatments are necessary, we will only use agents that have the least impact on nontarget species and on the wilderness environment in compliance with current Service policy. We may make an exception to introducing species (see section 2.17) for Service-approved, nonnative biological control agents.”

Pre-planning efforts should have already been undertaken to facilitate the development of the MRA. In Alaska, all actions taken in Wilderness require an MRA. A short-form MRA has been developed for use only in Alaska. Contact the Service Alaska Wilderness Coordinator for this form: **Roger Kaye, roger\_kaye@fws.gov**. Further instructions are available in [Appendix B](#).

- If the short-form MRA is not appropriate, particularly if managers are considering a use prohibited by Section 4(c) of the Wilderness Act of 1964, use the Arthur Carhart National Wilderness Training Center’s [Minimum Requirements Decision Guide](#) (Carhart standard form) to complete the MRA.
- This guide can help to identify if actions are warranted in Wilderness. Things to consider include whether or not options outside of Wilderness can be taken to address a situation, and if actions are necessary by meeting the following criteria:
  - Is action necessary to satisfy valid existing rights or a special provision in Wilderness legislation?
  - Is action necessary to meet the requirements of other federal laws?
  - Is action necessary to preserve one or more of the qualities of wilderness character: Untrammeled, Undeveloped, Natural, Solitude or Primitive and Unconfined Recreation, or Other Features of Value that reflect the character of this area?

An example Minimum Requirements Analysis case study for [non-native invasive plants can be found here, with additional detail](#). [This Alaska Supplement provides assistance](#) in adapting the use of the Minimum Requirements Decision Guide to Alaska’s Wilderness units with respect to the Wilderness Act of 1964 and the Alaska National Interest Lands Conservation Act.

### Step 6: Implement Incident Response

#### □ **STEP 6: DEVELOP AND IMPLEMENT INCIDENT RESPONSE**

This step provides the framework to develop an incident response plan, which is a systematic process to direct and enact response actions while ensuring all involved entities work together and all regulatory permitting needs are met. The incident response will likely involve several agencies and organizations who will play a role in implementing actions.

#### **Step 6 Strategic Tasks**

- 1) Draw from existing resources to inform further actions. A number of documents that may inform eradication efforts have been referenced throughout this plan, several of which are compiled in [Tool 6.1](#).
- 2) Define a clear management goal.
  - a) The goal of rapid response efforts should be eradication of newly identified infestations. In some cases this may not be feasible and alternative goals may be pursued. All members of the response team should be in agreement with the management goal for the incident response.
  - b) For established infestations of breeding populations, longer-term efforts to develop management/eradication plans will likely be necessary. Such large-scale projects do not constitute rapid response and are outside the scope of this document.
- 3) Review existing environmental documents and acquire regulatory permits (see [Tool 6.2- 6.5](#)).
  - a) If a situation involves immediate threats to human health or safety, or immediate threats to valuable natural resources, an agency must consider whether there is sufficient time to follow the normal procedures for environmental review under the National Environmental Policy Act (NEPA). If not, emergency actions are allowed to be taken with notification of such action (see [Tool 6.4](#) for further detail).
  - b) Identify a qualified individual to oversee all permitting. Ensure that Service and State Pesticide Use Permits and Proposals, as well as Endangered Species Act (ESA) Section 7 Consultation, are completed as applicable (see [Tools 6.2 – 6.5](#)).
- 4) Use the framework provided in [Tool 6.6](#) to develop a response plan. This will include defining a timeline for response, identifying the best qualified individuals to complete each on-the-ground response action, as well as identifying/confirming available resources, among other considerations.
  - a) Taking into account the required permits, time of year, and logistics of the site, identify the ideal timing for enacting response actions. All partners and the broader public should be made aware of this timeline.
  - b) Certified Pesticide Applicators must be involved in the on-the-ground response if rodenticides will be used. If rodenticide use is being considered, contact ADEC immediately to coordinate.

#### **Step 6 Roles and Responsibilities**

- The Service Regional IPM coordinator ([Tool 6.3](#)) can provide insight into the Service's Pesticide Use Proposal process if needed.

Step 6: Implement Incident Response

Step 6 Tools

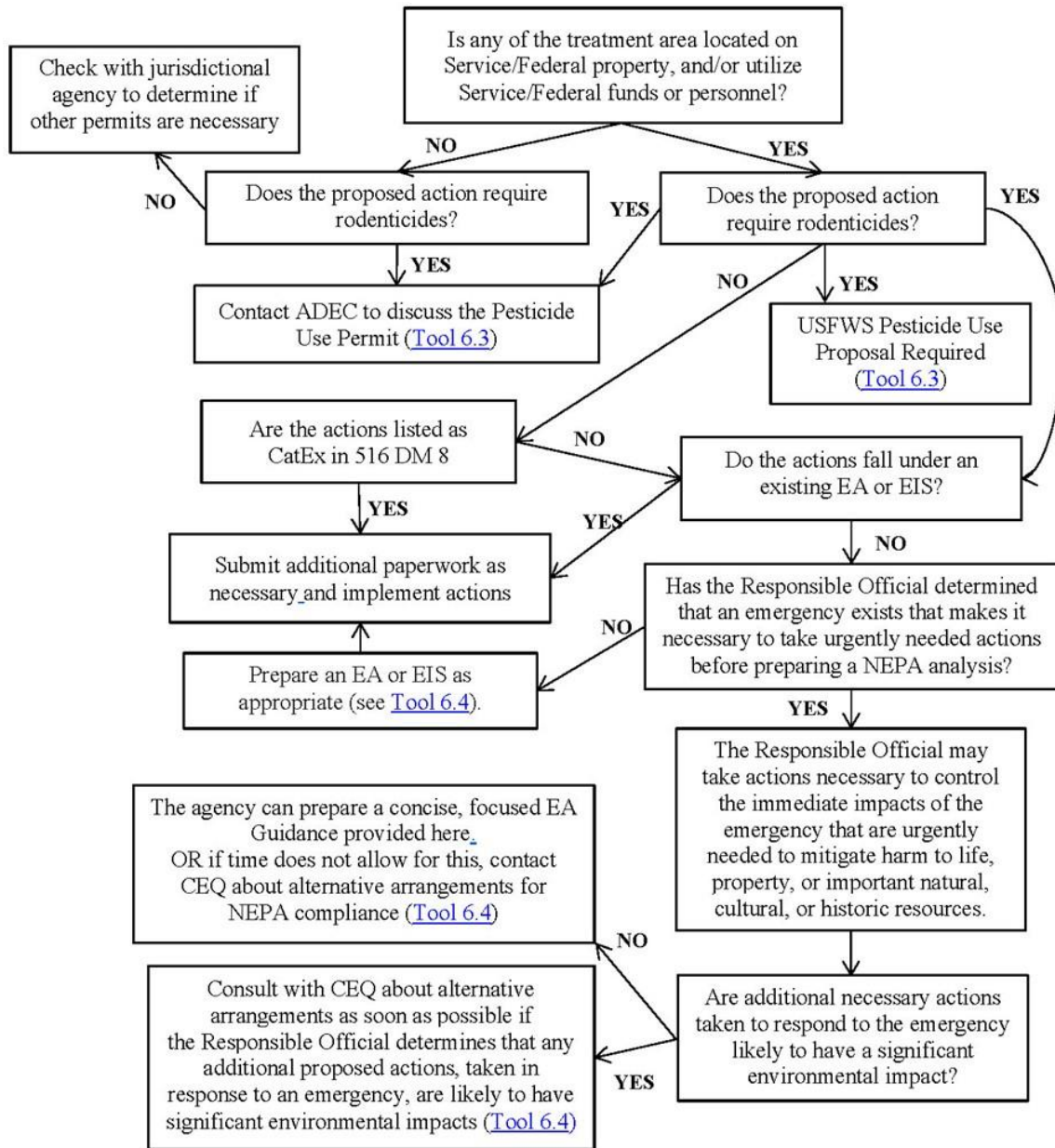
**Tool 6.1. Existing Documents to Inform Rapid Response Actions**

[Fritts, E. I. 2007. Wildlife and People at Risk: A Plan to Keep Rats Out of Alaska. Alaska. Department of Fish and Game. Juneau Alaska. 190 pp.](#)

[The National Park Service Integrated Pest Management Training Manual for Commensal Rodents.](#)

[Stoprats.org. Resources for Preventing and Addressing Rodents in Alaska.](#)

**Tool 6.2. Regulatory Permitting Flowchart**



Step 6: Implement Incident Response

**Tool 6.3. Pesticide Use Permits and Proposals**

If the response actions will include the use of rodenticides, permits must be obtained from the appropriate state and federal agencies. Also note that any individuals physically carrying out the application of pesticides must have undergone the ADEC Certified Pesticide Applicator Training and have the appropriate endorsement (see [Tool 1.2](#)).

***Service Pesticide Use Proposal***

If pesticides (including rodenticides) are used on Service property, purchased with Service funds, or applied by Service personnel, a Service Pesticide Use Proposal (PUP) must be completed by a Service member. Completion of the PUP can be done by the appropriate personnel through the online portal system. Within the portal, users can select to create a new PUP or modify an existing PUP. A Service PUP may require an Endangered Species Act (ESA) Section 7 Consultation if actions may affect a threatened or endangered species. Further detail on Section 7 Consultation is provided in [Tool 6.4](#).

[See this link for additional information and instructions for completing the Service Pesticide Use Proposal](#), or contact the Service Regional Integrated Pest Management Coordinator:

<b>Role</b>	<b>Name</b>	<b>Contact Information</b>
Service Regional Integrated Pest Management Coordinator	Angela Matz	angela_matz@fws.gov (907) 786-3483

***ADEC Pesticide Use Permit***

The following are the conditions under which a Pesticide Use Permit from the ADEC are required: if pesticides are going to be applied by aircraft, to water, or are being carried out by a state, borough or city agency. Note, additional federal regulations may apply if aerial chemical treatments are pursued, but are not discussed in this document.

The ADEC should be included in close communication regarding treatment plans for rodents. Contact them to discuss permitting details. [Rodenticides registered by ADEC for use in Alaska can be found here](#). Carefully check all labels, as all products **MUST** be used according to label specifications. For example, some rodenticides may not be labeled for use in uninhabited areas, away from buildings, not in bait stations, etc. If in doubt, contact ADEC:

<b>Role</b>	<b>Name</b>	<b>Contact Information</b>
Pesticide Program Manager	Karin Hendrickson	karin.hendrickson@alaska.gov (907) 376-1856

Step 6: Implement Incident Response

**Tool 6.4. National Environmental Policy Act (NEPA)**

**General NEPA Guidance**

NEPA applies when a federal action would result in an effect on the environment or to human health, even when the effect would be beneficial, or when a federal agency responds to an outside request for a permit or license. Prior to completing the following tool, review existing documents to determine if the proposed actions fall under an existing NEPA analysis. Final versions of existing NEPA documents can be acquired from the Regional Invasive Species Coordinator. The level of environmental analysis required to comply with the NEPA will differ depending on the action proposed and the anticipated impacts. There are three different levels of NEPA analysis, these include:

- **Categorical Exclusion (CatEx).** If the proposed action is covered by one of the listed categorical exclusions and no extraordinary circumstances apply, no further analysis under the NEPA is required. The Department of the Interior (Department) and the Service have established a list of categorical exclusions that may cover the proposed action. The Department publishes the list of actions that are categorically excluded in 43 CFR 46.205 and 46.210. The Service’s CatEx list is in 516 DM 8. It is not necessary to document that an action qualifies as a CatEx before implementing the action, but in certain circumstances it may be prudent to do so. [Department Categorical Exclusions can be found here.](#)
  - **NOTE:** For an action where there may be some question about whether it qualifies as a CatEx, it is recommended that you create a record that shows how the action qualifies as a CatEx—called an Environmental Action Statement (EAS). An EAS format can be found in: [550 FW 3](#)
  - If working in cooperation with an agency that has a Categorical Exclusion for the proposed action, then the categorical exclusion may apply to the Service action, according to [516 DM 8](#), Section 8.5 (C) (8):
    - “Actions where the Service has concurrence or coapproval with another agency and the action is a categorical exclusion for that agency. This would normally involve one Federal action or connected actions where the Service is a cooperating agency.”
- **Environmental Assessment (EA).** If the proposed action is not covered by a CatEx, and the impacts of the proposed action are not likely to be controversial or to have a significant effect on the environment, then you should prepare an EA. If during preparation of the EA you find no significant impacts or impacts can be mitigated below a level of significance through mitigation commitments, then the NEPA review process ends with preparation of a Finding of No Significant Impact (FONSI), and you can implement the action. However, if analyses in an EA indicate that there will be significant or controversial impacts, then you must prepare an Environmental Impact Statement (EIS). If significant or controversial impacts from the proposed action are anticipated, doing an EIS from the beginning (and skipping the EA) may save time and resources.
- **Environmental Impact Statement (EIS).** If the action will have a significant impact on the environment or will be controversial, an EIS is required. Once you complete the EIS, you must develop and issue a Record of Decision that describes the alternative selected for implementation.

[Additional detail regarding the NEPA \(specific to Refuges\) can be found here.](#)

[The Service Draft NEPA Reference Handbook can be found here.](#)



Step 6: Implement Incident Response

**NEPA guidance in Emergency Situations**

**§ 46.150 Emergency responses.**

This section applies only if the [Responsible Official](#)\* determines that an emergency exists that makes it necessary to take urgently needed actions before preparing an analysis and documentation in accordance with the provisions in subparts D and E of this part.

- (a) The Responsible Official may take those actions necessary to control the immediate impacts of the emergency that are urgently needed to mitigate harm to life, property, or important natural, cultural, or historic resources. When taking such actions, the Responsible Official shall take into account the probable environmental consequences of these actions and mitigate foreseeable adverse environmental effects to the extent practical.
- (b) The Responsible Official shall document in writing the determination that an emergency exists and describe the responsive action(s) taken at the time the emergency exists. The form of that documentation is within the discretion of the Responsible Official.
- (c) If the Responsible Official determines that proposed actions taken in response to an emergency, beyond actions noted in paragraph (a) of this section, are not likely to have significant environmental impacts, the Responsible Official shall document that determination in an environmental assessment and a finding of no significant impact prepared in accordance with this part, unless categorically excluded (see subpart C of this part). If the Responsible Official finds that the nature and scope of the subsequent actions related to the emergency require taking such proposed actions prior to completing an environmental assessment and a finding of no significant impact, the Responsible Official shall consult with the Office of Environmental Policy and Compliance about alternative arrangements for the NEPA compliance. The Assistant Secretary, Policy Management and Budget or his/her designee may grant an alternative arrangement. Any alternative arrangement must be documented. Consultation with the Department must be coordinated through the appropriate [bureau](#) headquarters.
- (d) The Department shall consult with Council on Environmental Quality (CEQ) about alternative arrangements as soon as possible if the Responsible Official determines that proposed actions, taken in response to an emergency, beyond actions noted in paragraph (a) of this section, are likely to have significant environmental impacts. The Responsible Official shall consult with appropriate bureau headquarters and the Department, about alternative arrangements as soon as the Responsible Official determines that the proposed action is likely to have a significant environmental effect. Such alternative arrangements will apply only to the proposed actions necessary to control the immediate impacts of the emergency. Other proposed actions remain subject to NEPA analysis and documentation in accordance with this part.

\*Responsible Official: is the bureau employee who is delegated the authority to make and implement a decision on a proposed action and is responsible for ensuring compliance with the NEPA.

Additionally, the Executive Office of the President's CEQ, has issued the [following information regarding Emergency Actions under NEPA:](#)

### Step 6: Implement Incident Response

#### In the case of an emergency:

- 1) Do not delay immediate actions necessary to secure lives and safety of citizens or to protect valuable resources. Consult with CEQ as soon as feasible –please coordinate any communications with your agency’s NEPA contacts (see [http://ceq.doe.gov/nepa\\_contacts/federal.html](http://ceq.doe.gov/nepa_contacts/federal.html)).
- 2) Determine if NEPA is triggered, and the appropriate level of NEPA analysis:
  - a. Determine if the proposed action is being taken by a federal agency (e.g., city or state action does not trigger NEPA; federal decisions to fund city or state action do trigger NEPA) or is statutorily exempt from NEPA (certain FEMA response actions under the Stafford Act are exempt from NEPA, information is available at: [http://www.fema.gov/media-librarydata/20130726-1748-25045-1063/stafford\\_act\\_nepa\\_fact\\_sheet\\_072409.pdf](http://www.fema.gov/media-librarydata/20130726-1748-25045-1063/stafford_act_nepa_fact_sheet_072409.pdf)).
  - b. If the Federal agency proposed emergency response activity is not statutorily exempt from NEPA and the agency has a categorical exclusion (CE) that includes that type of activity, then apply the CE, unless there are extraordinary circumstances that indicate using the CE in this particular case is not appropriate. Agency NEPA personnel should be contacted regarding agency-specific definitions of actions that are “categorically excluded.”
  - c. If the proposed Federal agency emergency response activity is not statutorily exempt from NEPA a categorical exclusion is not available, and the potential impacts of the proposed response activity are not expected to be “significant” environmental impacts, then an Environmental Assessment (EA) is appropriate. Prepare a focused, concise EA as described [in Attachment 2](#). Alternative arrangements as outlined at 40 C.F.R.
    - i. §1506.11 do not apply because the environmental impacts are not expected to be significant. Agency NEPA personnel should be contacted regarding agency-specific definitions of “significant” actions.
- 3) If the proposed emergency response activity is not statutorily exempt from NEPA, is expected to have “significant” environmental impacts, the agency should determine whether it is covered by an existing NEPA analysis (e.g., implementing pre-existing spill response plans).
- 4) If the proposed emergency response activity is not statutorily exempt from NEPA and is expected to have “significant” environmental impacts, and is not already covered by an existing NEPA analysis, then the agency should consult with CEQ to determine whether “alternative arrangements” can take the place of an Environmental Impact Statement. Contact Ted Boling, Associate Director, 202-395-0827, [eboling@ceq.eop.gov](mailto:eboling@ceq.eop.gov) to develop alternative arrangements under 40 C.F.R. §1506.11.

Factors to address when requesting and crafting “alternative arrangements” include:

- nature, scope, and duration of the emergency;
- actions necessary to control the immediate impacts of the emergency;
- potential adverse effects of the proposed action;
- components of the NEPA process that can be followed and provide value to decision making (e.g., coordination with affected agencies and the public).

Step 6: Implement Incident Response

**Tool 6.5. Endangered Species Act Section 7 Compliance**

The Endangered Species Act (ESA) directs all Federal agencies to work to conserve endangered and threatened species and to use their authorities to further the purposes of the ESA. Section 7 of the ESA, called "Interagency Cooperation," is the mechanism by which Federal agencies ensure the actions they take, including those they fund or authorize, do not jeopardize the existence of any listed species. Information from: <https://www.fws.gov/endangered/laws-policies/section-7.html> and; <https://www.fws.gov/midwest/endangered/section7/s7process/7a2process.html>

*Informal Consultation*

Under Section 7, Federal agencies (including the Service) must consult with the Service when any action the agency carries out, funds, or authorizes (such as through a permit) *may affect* a listed endangered or threatened species. This process usually begins as informal consultation. A Federal agency, in the early stages of project planning, approaches the Service and requests informal consultation. Discussions between the two agencies may include what types of listed species may occur in the proposed action area, and what effect the proposed action may have on those species.

If the Federal agency, after discussions with the Service, determines that the proposed action is not likely to affect any listed species in the project area, and if the Service concurs, the informal consultation is complete and the proposed project moves ahead. If it appears that the agency’s action may affect a listed species, that agency may then prepare a biological assessment to assist in its determination of the project’s effect on a species.

*Formal Consultation and the Biological Opinion*

When a Federal agency determines, through a biological assessment or other review, that its action is *likely to adversely affect* a listed species, the agency submits to the Service a request for formal consultation. During formal consultation, the Service and the agency share information about the proposed project and the species likely to be affected. Formal consultation may last up to 90 days, after which the Service will prepare a biological opinion on whether the proposed activity will *jeopardize* the continued existence of a listed species. The Service has 45 days after completion of formal consultation to write the opinion.

In making a determination on whether an action will result in jeopardy, the Service begins by looking at the current status of the species, or "baseline." Added to the baseline are the various effects – direct, indirect, interrelated, and interdependent – of the proposed Federal action. The Service also examines the cumulative effects of other non-Federal actions that may occur in the action area, including state, Alaska Native, local, or private activities that are reasonably certain to occur in the project area. [Further information about the ESA Section 7 consultation can be found at this link.](#) Or contact the Service Endangered Species Coordinator for the Alaska Region for additional help or direction regarding Section 7 consultation.

Role	Name	Contact Information
Regional Endangered Species Program Coordinator	Drew Crane	drew_crane@fws.gov (907) 786-3323

Step 6: Implement Incident Response

**Tool 6.6. Incident Response Plan Framework**

**List the goals and objectives for the response to this infestation. Objectives should be simple, measurable, achievable, realistic, and time-bound.**

The primary objective of rapid response actions should be eradication whenever possible. However, eradication may not be feasible. In such cases, alternative objectives could include immediate actions taken to:

- Prevent further spread
- Contain rodents in known areas
- Protect human safety
- Note, however, that ongoing management for chronic infestations, or eradication efforts of established infestations is not a rapid response action, and should not be the goal listed above.

**Location of sighting**

Nearest town/city:

GPS Coordinates building/locations of sighting(s), etc:

**Extent of problem**

What is the approximate size of the impacted area?

Is the potential infestation in an inhabited or uninhabited area? Are there impediments to accessing the site?

Is this an established breeding population? (If so, eradication of such an issue may not constitute rapid response actions).

**Current Actions**

Are there any response actions currently taking place at the infestation site? (e.g., treatment for other invasive species, containment, control activities).

**Planned actions**

What response action was chosen for this infestation? What resources are needed for the response?

What resources are readily available?

For resources not readily available, how can they be obtained?

What actions are needed to limit non-target impacts (e.g., carcass removal, etc.)?

**Permitting and regulations** (select those that apply)

- ADEC PUP required
- Service PUP required
- CatEx
- EAS
- EA/FONSI
- EIS
- ESA Section 7 Consultation
- Minimum Requirements Analysis (for infestations in a Wilderness)
- Other:

Step 6: Implement Incident Response

**Personnel**

Who will be the responsible lead(s) in charge of overseeing the entire response plan (the Response Plan Implementation Coordinator identified in [Step 3](#))?

<b>Name</b>	<b>Agency</b>	<b>Contact Info</b>	<b>Role</b>
1)			
2)			

Who will be responsible for acquiring the needed resources?

<b>Name</b>	<b>Agency</b>	<b>Contact Info</b>	<b>Role</b>
1)			
2)			

Who will be responsible for overseeing outreach and communication to shareholders, partners and the public (Communication Coordinators identified in [Step 3](#))?

<b>Name</b>	<b>Agency</b>	<b>Contact Info</b>	<b>Role</b>
1)			
2)			

If necessary, who will be responsible for obtaining permits?

<b>Name</b>	<b>Agency</b>	<b>Contact Info</b>	<b>Role</b>
1)			
2)			

List other individuals directly involved in the response and their roles:

<b>Name</b>	<b>Agency</b>	<b>Contact Info</b>	<b>Role</b>
1)			
2)			

**Funding**

What is the estimated level of funding needed to implement this rapid response? What funding sources can be used to support this response effort?

Who will be responsible for securing funding for this response effort?

**Timeline**

When will permits be applied for?

When are permits anticipated to be obtained?

Goal date for implementing action(s)?

### Step 7: Effectiveness Monitoring

#### □ **STEP 7: EFFECTIVENESS MONITORING**

After the response actions have been taken, continued monitoring of the affected and surrounding areas will be necessary to determine efficacy of the response and observe any non-target effects. This step helps direct these actions.

#### **Step 7 Strategic Tasks**

- 1) Maintain a period of heightened vigilance.
  - a) During this period, existing barrel stations will be checked with increased regularity (e.g., in two week increments), traps may be replaced more frequently (monthly increments), and additional trap stations may continue to be serviced.
  - b) The response team should determine the timeline of the heightened vigilance period (weeks to months). This may not be applicable in uninhabited areas.
- 2) Take actions, such as carcass removal, to limit non-target affects.
  - a) Especially if toxic baits are used, develop a plan to search for and remove target (and non-target) carcasses during and after the application period to minimize further exposure to non-target species. Dispose of carcasses in a manner that ensures that there will be no exposure to non-target species.
  - b) A systematic process for detecting carcasses should be described in the Incident Response Plan or an associated step-down plan.
- 3) Assign leadership to oversight and direction of long-term monitoring efforts.
  - a) The Response Plan Implementation Coordinator may or may not be the individual in charge of long-term monitoring efforts.
  - b) Identifying new individual(s) to direct long-term monitoring may be necessary.
- 4) Establish a long-term monitoring protocol for areas that have undergone response actions (see [Tool 7.1](#)).
  - a) Secondary non-target effects can be delayed, so the monitoring period must be sufficient to detect this mortality. Use past experience or pilot work to identify high priority areas for monitoring, but use an adaptive approach if dictated by project-specific findings.
  - b) Monitoring efforts should include focus on areas that have undergone response actions, but may also include monitoring or early detection efforts in surrounding areas to verify if the infestation has spread to adjacent locations.
  - c) If rodenticides are deployed, projects should include monitoring for rodenticide residues in birds, fish, invertebrates, other project-appropriate organisms, and the abiotic environment (e.g., marine and fresh waters, soils). Ideally, monitoring would continue until residues are consistently below the minimum detection limits. The residue sampling period will be a function of: (1) persistence of bait in the environment; (2) persistence of rodenticide in environmental media (soil, water); (3) persistence of rodenticide in organisms (e.g., plants, invertebrates, mammals, and birds).
  - d) In general, an eradication is considered successful if no sign of rat presence is found after 2 years of monitoring (Howald et al. 2007). If after two years no rodents are detected, monitoring may be eliminated or reduced. However, the 2-year guideline is generally in reference to islands with limited ability for recolonization. It can be challenging to determine eradication success in areas that may be easily re-colonized, though genetic study can distinguish re-colonization from failed eradication.

### Step 7: Effectiveness Monitoring

In areas where re-colonization is likely, monitoring efforts and use of biosecurity stations may continue even after 2 years.

#### Step 7 Roles and Responsibilities

- The leadership in charge of long term monitoring efforts should also establish a plan for continued communication with partners and the Service Regional Office.
- Ongoing communication to keep the public apprised of ongoing efforts and outcomes will likely be necessary. A public communication coordinator may continue to be assigned to this task.

#### Step 7 Tools

##### **Tool 7.1. Resources for Long-Term Monitoring Efforts**

While the following document was developed for a large-scale eradication project, some sections are relevant to monitoring efforts following rapid response actions. [Refer to Section 2.2.6 in this Environmental Assessment for further direction on how to monitor eradication efficacy and ecosystem response.](#)

The following resources provide insight into additional methods to assess eradication success, including using wax tag surveys immediately following eradication attempts. While these studies focus on island systems, such efforts could be modified to use in coastal non-island areas.

[Samaniego-Herrera, A., Anderson, D.P., Parkes, J.P. and Aguirre-Muñoz, A. \(2013\). Rapid Assessment of Rat Eradication after Aerial Baiting. \*Journal of Applied Ecology\*, 50: 1415- 1421. doi:10.1111/1365-2664.12147](#)

[Howald, G., Donlan, C.J., Galvan, J.P., Russell, J.C., Parkes, J., Samaniego, A., Wang, Y., Veitch, D., Genovesi, P., Pascal, M., Saunders, A. and Tershy, B. \(2007\). Invasive Rodent Eradication on Islands. \*Conservation Biology\*, 21:1258-1268. doi:10.1111/j.1523-1739.2007.00755.x](#)

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- Island Conservation. (2006). Evaluation of primary and secondary exposure risks to land bird species for: experimental use permit application for field efficacy trial of 0.0025% brodifacoum broadcast bait to eradicate introduced rats from Aleutian Islands in the Alaska Maritime National Wildlife Refuge, July 20, 2006. Island Conservation, Center for Ocean Health, 100 Shaffer Rd, Santa Cruz, CA 95060. 17 pp.)
- Johnson, T. (2008). Rat control for Alaska waterfront facilities. Alaska Sea Grant College Program, University of Alaska, Fairbanks, Fairbanks, Alaska.
- Lowe, S., Browne, M., Boudjelas, S., and De Poorter, M. (2000). 100 of the world's worst invasive alien species: a selection from the global invasive species database (Vol. 12). Auckland, New Zealand: Invasive Species Specialist Group.
- Meerburg, B. G., Singleton, G. R., & Kijlstra, A. (2009). Rodent-borne diseases and their risks for public health. *Critical reviews in microbiology*, 35(3):221-270.
- New Zealand Department of Conservation. (2002). Southern islands biodiversity action plan (Vol.4). Southland Conservancy, Department of Conservation, Invercargill. (See [http://www.doc.govt.nz/pdfs/southland/Publications/Bio-Action-Plan-Vol.4 complete.pdf](http://www.doc.govt.nz/pdfs/southland/Publications/Bio-Action-Plan-Vol.4%20complete.pdf))
- Pacific Invasive Initiative. Resource kit for rodent and cat eradication: guidelines on rodent surveillance techniques. <http://www.pacificinvasivesinitiative.org/rce/index.html>, accessed February 1, 2020.
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Appendix A: Known Infestations in Alaska

**APPENDICES**

**Appendix A. Locations of known rodent infestations in Alaska**

A reliable method needs to be developed for recording and reporting data about occurrence of rats in Alaska. The following tables were prepared by J. Meehan and E. Fritts from information provided by ADF&G and Service staff, University of Alaska Fairbanks museum collections, and Service Resource Publication 193 (Bailey 1993).

**Table A1.** Alaska sites having past reports of rats, with estimation of current status. Suspected absent = A; suspected eliminated by human actions = E; rats reported, presence of breeding population is unknown = R. All data are from Fritts 2007; the most recent date of available data. These may not represent current status in 2020.

<b>Site</b>	<b>Rat Species</b>	<b>Current Status</b>
Anchorage	Norway and unknown	R
Clam Gulch	Norway	E
Cordova	Norway	A
Douglas	Norway	R
Eek	Unknown	R
Homer	Norway	R
Kenai	Unknown	R
King Cove	Unknown	R
Kotzebue	Norway	R
Marshall	Unknown	R
Nikiski	Norway	R
Sand Point	Unknown	R
Sanak Island	Norway	A
Wasilla	Norway	R
Wrangell	Unknown	R

Appendix A: Known Infestations in Alaska

**Table A2.** Islands and communities where introduced rats have been sighted and for which it is confirmed or likely that a breeding population has become established; although not listed here, many islets around larger infested islands (e.g., Adak, Atka, Unalaska) are also believed to support breeding populations of rats. Current status, breeding population confirmed or is likely = B. All data are from Fritts 2007, the most recent date of available data. These may not represent current status in 2020. With the exception of data for Rat Island (now known as Hawadax) in 2020.

Site	Rat Species	Current Status
Adak Island	Norway	B
Akutan Island	Norway	B
Amchitka Island	Norway	B
Atka Island	Norway	B
Attu Island	Norway	B
Bat Island	Norway	B
Bell’s Flat (Kodiak)	Norway and Roof	B
Bird Rock	Norway	B
Bolshoi Islets	Norway	B
City of Kodiak	Norway and Roof unknown, likely	B
Craig	Norway	B
Fairbanks/College	Norway	B
Great Sitkin Island	Norway	B
Juneau	Norway	B
Kagalaska Island	Norway	B
Ketchikan	Norway	B
Kiska Island	Norway	B
Little Kiska Island	Unknown	A
Makarius Island	Norway	B
Nome	Norway	B
Ogangen Island	Norway unknown, likely	B
Petersburg	Norway	B
Rat Island (Hawax)	Norway, eradicated	Eradicated
Seal Rocks	Norway	B
Sedanka Island	Norway	B
Shemya Island	Roof	B
Sitka	Norway	B
Unalaska	Norway	B

**Table A3.** Islands in the Alaska Maritime National Wildlife Refuge known to have rats. All other islands in the Alaska Maritime NWR should be considered rat free. Table from Alaska Regional Response Team Wilderness Protection Committee 2020.

Fox Islands	Andreanof Islands	“Rat” Islands	Near Islands
Unalaska	Adak	Kiska	Attu
Amaknak	Great Sitkin	Amchitka	Shemya
Akutan		Kagalaska	
Sedanka		Atka	

**Appendix B. Service Alaska Region Minimum Requirements Analysis Short Form  
Instructions and Tips**

**When is it appropriate to use the short form as opposed to the standard Carhart form?**

The standard form (see link below for the Carhart form) is appropriate for all projects. It is necessary for consideration of all projects proposing use of any Wilderness Act Section 4c prohibited use. However, it may be most efficient to reserve the Carhart form for more complicated projects (those having many project components, greater impacts, complexity, or controversy). The short form is appropriate for projects that are simple, have fewer impacts, fewer project components, and are less controversial. Examples of appropriate use of the short form include the following: water sampling on lakes with access by floatplane; law enforcement patrols by airplane that do not disturb sensitive resources; routine maintenance of a historic cabin using hand tools with access by motorboat; and archeological survey with small test pits conducted by foot.

If you are having trouble answering any of the questions on the short form, it is a good indication that the standard form is a better fit for that project. It is not appropriate to use the short form on projects that, for example, propose use of a helicopter, large field camps of long duration, lethal sampling, release of chemical tracers, or a survey of visitors within the Wilderness. In these instances the standard form is more appropriate because of the space required to evaluate a broader range of alternatives and impacts, and to do so in a more thorough and complete way.

Usually a project proposal exists independently of the MRA form. If so, attach that description with the MRA.

If a more in-depth MRA is warranted, use the Arthur Carhart National Wilderness Training Center's Minimum Requirements Decision Guide (Carhart standard form), found here: <http://www.wilderness.net/MRA>

Is the project necessary to meet the specific requirements of any law?

Identify any valid existing rights, special provision in the Wilderness Act, or requirement of other law that requires the action. Cite the law and section as applicable. Describe whether the law says that a specific action "shall" be taken or that an action "may" be taken. This is an important distinction, if the law says "may" then the action is discretionary and it needs to be evaluated whether it is actually necessary for the administration of the area as wilderness. In asking if the project is "necessary" to meet the requirements of another law, then it must happen to comply with the law. If we didn't take the action, we would be violating the law.

Apparent conflicts between the Wilderness Act and other legislation may require innovative approaches and not all apparent conflicts are genuine. No law over-rides another law (unless specifically stated in the superseding law). The requirements of all applicable laws must be met.

Appendix B: Minimum Requirements Analysis Short Form

Federal laws that do not directly address wilderness may influence the need for actions in wilderness. In some instances, the administrator is asked to satisfy the requirements of multiple laws. Likely examples in Alaska include:

Alaska National Interest Lands Conservation Act of 1980 (ANILCA), 16 U.S.C. 3150.  
Management of a site listed on the National Register of Historic Places (National Historic Preservation Act).

Alaska Mineral Resource Assessment Program (AMRAP) authorized by section 1010 of ANILCA.

Does the project propose a Wilderness Act Section 4c prohibited activity, other than use of motorboats, aircraft, and snow machines for access, as provided for in ANILCA Section 1110?

If so, use the standard MRA form. Note that ANILCA allows these exceptions for access, not, for example, the use of motorboats for fishing, or snow machines for hi boarding.

Can the project be accomplished with only minimal impacts to wilderness character, wilderness resources, and wilderness values? Minimal impacts includes impacts that are no greater than an average recreational trip would have in the same vicinity, time of year, etc.

Describe potential impacts of the action, as proposed, to each quality of wilderness character. These qualities are described below:

- **Untrammeled Quality** – In wilderness, “the earth and its community of life” are essentially unhindered and free from modern human control or manipulation, ”in contrast with those areas where man and his own works dominate the landscape.” This quality is important because it helps insure that wilderness is managed with the utmost humility and restraint, respecting the autonomy of nature that allows a place to be wild and free. However, it is unlikely that action is necessary to preserve this quality, unless the decision is to stop taking action. In fact, to preserve this quality it may be necessary to cease actions that manipulate “the earth and its community of life” that are not needed to preserve some other quality of wilderness character.
- **Natural Quality** – A wilderness area is to be “protected and managed so as to preserve its natural conditions.” Wilderness ecological systems are substantially free from the effects of modern civilization. Preserving this quality ensures that indigenous species, patterns and ecological processes are protected and allows us to understand and learn from natural features. To preserve this quality, it may be necessary to take action to correct unnatural conditions even if they were present at the time of designation.
- **Undeveloped Quality** – Wilderness retains its “primeval character and influence,” and is essentially “without permanent improvements” or modern human occupation. Preserving this quality keeps areas free from “expanding settlement and growing mechanization” and “with the imprint of man’s work substantially unnoticeable” as required by the Wilderness Act. To preserve this quality, it may be necessary to remove existing structures or installations which are unnecessary for the administration of the area as wilderness or otherwise are not features of the area’s wilderness character.

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- **Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation Quality –** The Wilderness Act defines wilderness as having “outstanding opportunities for solitude or a primitive and unconfined type of recreation.” This quality is about the opportunity for people to experience wilderness. The opportunities provided by wilderness include the chance to experience primitive recreation, natural sights and sounds, solitude, freedom, risk, the physical and mental challenges of self-discovery and self-reliance, and to use traditional skills free from the constraints of modern culture. Look at each sub-part of this quality (solitude, primitive recreation, unconfined recreation) to determine if there is a need for action. To preserve this quality, it may be necessary to take action to improve solitude, primitive recreation, or unconfined recreation beyond the conditions present at the time of designation.
- **Other Features of Value Quality –** The Wilderness Act states that areas “may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value”. Some of these features, such as the presence of threatened and endangered species, are also part of the Natural quality of a wilderness and could be evaluated for effects to that quality unless the specific species or habitat is unique to the wilderness area. Other features, however, such as the presence of important geological formations, cultural resources, historical sites, or paleontological localities, do not fit easily into one of the other four qualities. While many different types of features could be included, the intent is to include those that are significant or integral to the wilderness. Features mentioned in wilderness enabling legislation or legislative history would likely qualify.

**Determine the minimum activity**

Where feasible, describe at least two alternative methods to accomplish project objectives.

Describe the relative impacts of all alternatives to the applicable wilderness character qualities. Dropped alternatives should be briefly mentioned. Valid reasons for deciding that an alternative is unacceptable or not feasible should be limited to: 1) actions that are impossible to accomplish by any means, 2) actions that are possible to accomplish but implementation would cause unacceptably greater negative impacts to wilderness character or, 3) actions that would cause an unacceptable safety risk to workers or the public which cannot be mitigated. Alternatives should not be eliminated from full consideration simply because implementation would take more time or money, or because the skills or equipment needed are not readily available on the local unit.

**Select a preferred alternative**

Briefly describe the benefits or adverse effects to the qualities of wilderness character and other legal requirements:

- If any of the qualities of wilderness character are degraded in the selected alternative, you must explain how that degradation is justified by preserving wilderness character as a whole.
- If you are selecting an alternative that does not have the least negative impact to wilderness character, explain why. The most common examples of this are due to safety reasons.
- If the least impact to wilderness character is found to be the same in two or more

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alternatives, you may base your decision on the other criteria (perpetuation of traditional skills, economics, and safety). Explain your reasoning.

The rationale should demonstrate that the determination is clearly a result of objective evaluation of the alternatives and not the result of an inappropriate bias or justification of an alternative or method for non-wilderness reasons. If your selection is based at least in part on the safety criterion, be sure to explain the rationale and include or reference supporting analysis or documentation.

Avoid selecting an alternative based primarily on cost and time of implementation. While administrative activities should always be accomplished with economic efficiency, both law and agency policy directs us away from considering the cost as the over-riding factors for administrative use of otherwise prohibited activities. The Wilderness Act provides only the following as legal basis for approving use of any of the Section 4(c) prohibited uses for administrative activities:

“...except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act...”

After you have completed the MRA Worksheet make sure that any mitigation, monitoring, and reporting requirements are summarized on the first signature page.

**Approval of the MRA**

Like the standard form MRA, decisions made via the short form must be approved according to the provisions of our Wilderness Stewardship Policy, Section 1.20: “Refuge managers may make minimum requirement decisions only if they have attended the Carhart Center’s national wilderness stewardship course. If refuge managers have not attended this training, they must send the MRA to their refuge supervisor for approval. If the supervisor lacks the required training, the supervisor must request review and approval from an individual who has had this training and is equal to or higher than the refuge manager in the organizational hierarchy.”