

# Appendix A

## Key Legislation and Policies

This appendix briefly describes the guidance for the National Wildlife Refuge System (Refuge System) as well as policies and key legislation that guide the management of the Rocky Mountain Arsenal National Wildlife Refuge.

### A.1 National Wildlife Refuge System

The mission of the Refuge System is to administer a national network of lands and waters for the conservation, management, and, where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

#### Goals of the National Wildlife Refuge System

- Conserve a diversity of fish, wildlife, and plants and their habitats, including species that are endangered or threatened with becoming endangered.
- Develop and maintain a network of habitats for migratory birds, anadromous and inter-jurisdictional fish, and marine mammal populations that is strategically distributed and carefully managed to meet important life history needs of these species across their ranges.
- Conserve those ecosystems, plant communities, wetlands of national or international significance, and landscapes and seascapes that are unique, rare, declining, or under-represented in existing protection efforts.
- Provide and enhance opportunities to participate in compatible wildlife-dependent

recreation (hunting, fish, wildlife observation and photography, and environmental education and interpretation).

- Foster understanding and instill appreciation of the diversity and interconnectedness of fish, wildlife, and plants and their habitats.

#### Guiding Principles of the National Wildlife Refuge System

There are four guiding principles for management and public use of the Refuge System established by Executive Order 12996:

- *Public Use*—The Refuge System provides important opportunities for compatible wildlife-dependent recreational activities involving hunting, fishing, wildlife observation and photography, and environmental education and interpretation.
- *Habitat*—Fish and wildlife will not prosper without quality habitat, and without fish and wildlife, traditional uses of refuges cannot be sustained. The Refuge System will continue to conserve and enhance the quality and diversity of fish and wildlife habitat within refuges.
- *Partnerships*—America's sportsmen and women were the first partners who insisted on protecting valuable wildlife habitat within wildlife refuges. Conservation partnerships with other Federal agencies, State agencies, tribes, organizations, industry, and the public can make significant contributions to the growth and management of the Refuge System.
- *Public Involvement*—The public should be given a full and open opportunity to participate in decisions about acquisition and management of national wildlife refuges.

## A.2 Other Legal and Policy Guidance

Management actions on national wildlife refuges are constrained by many mandates, including laws and Executive orders. The more common regulations that affect refuge management are listed below.

- **American Indian Religious Freedom Act (1978):** Directs agencies to consult with native traditional religious leaders to determine appropriate policy changes necessary to protect and preserve Native American religious cultural rights and practices.
- **Americans with Disabilities Act (1992):** Prohibits discrimination in public accommodations and services.
- **Antiquities Act (1906):** Authorizes the scientific investigation of antiquities on Federal land and provides penalties for unauthorized removal of objects taken or collected without a permit.
- **Archaeological and Historic Preservation Act (1974):** Directs the preservation of historic and archaeological data in Federal construction projects.
- **Archaeological Resources Protection Act (1979), as amended:** Protects materials of archaeological interest from unauthorized removal or destruction and requires Federal managers to develop plans and schedules to locate archaeological resources.
- **Architectural Barriers Act (1968):** Requires federally owned, leased, or funded buildings and facilities to be accessible to persons with disabilities.
- **Bald and Golden Eagle Protection Act (1940):** Provides for the protection of the bald eagle (the national emblem) and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession, and commerce of such birds.
- **Clean Air Act (1970, amended 1990):** Restricts the amount of pollutants that can be emitted into the air. Designated wilderness areas including the Great Sand Dunes National Park and Preserve (adjacent to portions of Baca National Wildlife Refuge) have the highest standards (class I) for pollution and visibility.
- **Clean Water Act (1977):** Requires consultation with the U.S. Army Corps of Engineers (404 permits) for major wetland modifications.
- **Data Quality Act (2001):** Requires government agencies to ensure and maximize the quality, objectivity, utility, and dissemination of information by Federal agencies.
- **Dingell-Johnson Act (1950):** Authorizes the Secretary of the Interior to provide financial assistance for State fish restoration and management plans and projects. Financed by excise taxes paid by manufactures of rods, reels, and other fishing equipment.
- **Emergency Wetlands Resources Act (1986):** Promotes wetland conservation for the public benefit to help fulfill international obligations in various migratory bird treaties and conventions. The act authorizes buying wetlands with Land and Water Conservation Fund monies.
- **Endangered Species Act (1973):** Requires Federal agencies to carry out programs for the conservation of endangered and threatened species.
- **Executive Order 11988 (1977):** Requires Federal agencies to provide leadership and take action to reduce the risk of flood loss, minimize the impact of floods on human safety, and preserve the natural and beneficial values served by the floodplains.
- **Executive Order 12996, Management and General Public Use of the National Wildlife Refuge System (1996):** Defines the mission, purpose, and priority public uses of the National Wildlife Refuge System. It also presents four principles to guide management of the Refuge System.
- **Executive Order 13007, Indian Sacred Sites (1996):** Directs Federal land management and other agencies to accommodate access to and ceremonial uses of Indian sacred sites by Indian religious practitioners, avoid adversely affecting the physical integrity of such sacred sites and, where appropriate, maintain the confidentiality of sacred sites.

- Executive Order 13352, Cooperative Conservation (2004): Directs Federal agencies to implement laws relating to the environment and natural resources in a manner that promotes cooperative conservation with an emphasis on appropriate inclusion of local participation in Federal decision making in accordance with respective agency missions and policies.
- Executive Order 13443, Facilitation of Hunting Heritage and Wildlife Conservation (2007): Directs Federal land management and other agencies to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat.
- Executive Order 13653, Preparing the United States for the Impacts of Climate Change (2013): Directs Federal Government agencies to build on recent progress and pursue new strategies to improve the Nation's preparedness and resilience in preparing and adapting to climate change.
- Federal Noxious Weed Act (1990): Requires the use of integrated management systems to control or contain undesirable plant species and an interdisciplinary approach with the cooperation of other Federal and State agencies.
- Federal Records Act (1950): Requires the preservation of evidence of the Government's organization, functions, policies, decisions, operations, and activities, as well as basic historical and other information.
- Fish and Wildlife Coordination Act (1958): Allows the U.S. Fish and Wildlife Service to enter into agreements with private landowners for wildlife management purposes.
- Migratory Bird Conservation Act (1929): Establishes procedures for acquisition by purchase, rental, or gifts of areas approved by the Migratory Bird Conservation Commission.
- Migratory Bird Hunting and Conservation Stamp Act (1934): Authorizes the opening of part of a refuge to waterfowl hunting.
- Migratory Bird Treaty Act (1918): Designates the protection of migratory birds as a Federal responsibility, and enables the setting of seasons and other regulations including the closing of areas, Federal or non-Federal, to the hunting of migratory birds.
- Native American Policy (1994): Articulates the general principles that guide the U.S. Fish and Wildlife Service's government-to-government relationship to Native American governments in the conservation of fish and wildlife resources.
- National Environmental Policy Act (1969): Requires all agencies, including the U.S. Fish and Wildlife Service, to examine the environmental impacts of their actions, incorporate environmental information, and use public participation in the planning and implementation of all actions. Federal agencies must integrate this act with other planning requirements, and prepare appropriate documents to facilitate better environmental decision making. [From the Code of Federal Regulations (CFR), 40 CFR 1500]
- National Historic Preservation Act (1966), as amended: Establishes as policy that the Federal Government is to provide leadership in the preservation of the Nation's prehistoric and historical resources.
- National Wildlife Refuge System Administration Act (1966): Defines the National Wildlife Refuge System and authorizes the Secretary of the Interior to permit any use of a refuge, provided such use is compatible with the major purposes for which the refuge was established.
- National Wildlife Refuge System Improvement Act of 1997: Sets the mission and administrative policy for all refuges in the National Wildlife Refuge System; mandates comprehensive conservation planning for all units of the Refuge System.
- Native American Graves Protection and Repatriation Act (1990): Requires Federal agencies and museums to inventory, determine ownership of, and repatriate cultural items under their control or possession.
- Paleontological Resources Preservation Act of 2009: Requires the Secretary of Interior and Agriculture to manage and protect paleontological resources on Federal land using scientific principles and expertise.

- **Refuge Recreation Act (1962):** Allows the use of refuges for recreation when such uses are compatible with the refuge's primary purposes and when sufficient funds are available to manage the uses.
- **Rehabilitation Act (1973):** Requires programmatic accessibility in addition to physical accessibility for all facilities and programs funded by the Federal Government to ensure that any person can participate in any program.
- **Rivers and Harbors Act (1899):** Section 10 of this act requires the authorization of U.S. Army Corps of Engineers before any work in, on, over, or under navigable waters of the United States.
- **Rocky Mountain Arsenal National Wildlife Refuge Act of 1992:** Created the Rocky Mountain Arsenal NWR out of lands transferred from the U.S. Army and established the purposes of the refuge.
- **Volunteer and Community Partnership Enhancement Act (1998):** Encourages the use of volunteers to help in the management of refuges within the Refuge System; facilitates partnerships between the Refuge System and non-Federal entities to promote public awareness of the resources of the Refuge System and public participation in the conservation of the resources; and encourages donations and other contributions.
- **Wilderness Act (1964):** The act (Public Law 88-577) [16 United States Code §§ 1131–36] defines wilderness as “A wilderness, in contrast with those areas where man and his works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain.”

# Appendix B

## *Compatibility Determinations*

### B.1 Uses

We have developed draft compatibility determinations for the following existing and proposed uses. As per our planning policy, we provide these compatibility determinations in our Draft CCP and EIS as part of the public review. These only apply to the Service's preferred alternative. Refer to chapter 1, section 1.2, for more information on compatible refuge uses.

- Hunting
- Fishing
- Wildlife observation, photography, environmental education, and interpretation
- Commercial photography
- Research
- Refuge Perimeter Trail

### B.2 Establishing Authority and Refuge Purposes

The mission of the Refuge System is “to administer a national network of lands and waters for the conservation, management, and, where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.”

The refuge was established by the Rocky Mountain Arsenal National Wildlife Refuge Act of 1992 (Public Law 102-402). Section 4 (c) of this Act outlined the following purposes for the refuge:

- (1) To conserve and enhance populations of fish, wildlife, and plants within the refuge, including populations of waterfowl, raptors, passerines, and marsh and water birds.
- (2) To conserve species listed as threatened or endangered under the Endangered Species Act and species that are candidates for such listing.

(3) To provide maximum fish and wildlife oriented public uses at levels compatible with the conservation and enhancement of wildlife and wildlife habitat.

(4) To provide opportunities for compatible scientific research.

(5) To provide opportunities for compatible environmental and land use education.

(6) To conserve and enhance the land and water of the refuge in a manner that will conserve and enhance the natural diversity of fish, wildlife, plants, and their habitats.

(7) To protect and enhance the quality of aquatic habitat within the refuge.

(8) To fulfill international treaty obligations of the United States with respect to fish and wildlife and their habitats.

### B.3 Description of Use

#### Hunting

The refuge proposes to provide safe and sustainable big game and migratory bird hunting opportunities within designated areas. Under the authority of the National Wildlife Refuge Administration Act, the Secretary of the Interior can authorize hunting on any unit of the National Wildlife Refuge System as long as it is compatible with the purposes for which the refuge was established.

Specifically, the refuge proposes limited programs for white-tailed deer, mule deer, and doves. All hunts would be based on a lottery and would only be offered to youth and hunters with disabilities. The refuge is atypical because it is surrounded by a large fence that prevents big game from entering or exiting the

refuge. In the past, this has allowed deer populations to exceed carrying capacity. Doves are typically migratory and only spend some of their time on the refuge. Hunting would be restricted to areas that are not open to other public uses.

In addition, the refuge proposes a new hunter education program specifically for youth.

### **Availability of Resources**

We will have a full-time law enforcement officer to help administer the hunting program. Other staff would be trained to assist with hunter education programs.

### **Anticipated Impacts of Use**

Big game hunting will be limited to archery only. Upland bird hunting requires the use of shotguns. As with all hunting programs that use firearms, human safety is an important consideration. Hunters, other refuge users, and refuge staff are exposed to potential hazards whenever firearms are present. Harvest of individual animals can have adverse effects on larger populations if sustainable harvest practices are not used. Hunting activity in one area of a refuge often causes animals to move to other portions of the refuge. We often maintain areas that are closed to hunting along with areas where hunting is allowed. Hunter education programs would be offered indoors at existing facilities and would require a temporary archery range.

### **Determination**

Hunting of big game and doves and hunter education programs are compatible uses of the Rocky Mountain Arsenal National Wildlife Refuge.

### **Stipulations Necessary to Ensure Compatibility**

- All hunting will require a permit.
- Plans for specific hunting programs would ensure reasonable human safety by only allowing hunting in areas closed to other public uses, maintaining hunter densities at or below reasonable levels, providing information to hunters regarding areas they are hunting in and associated conditions, and maintaining law enforcement and staff presence to enable response to emergencies and provide information in the field.
- Plans for specific hunting programs would exclude areas from hunting activity if there is a risk to human safety or if there is a risk of property damage from firearm discharge.
- Illegal activities, including hunting violations, would be reduced by providing well-thought-out information and sufficient law enforcement presence.
- All hunting programs would be coordinated with CPW.
- All hunting programs would consider population objectives. Dove hunting would follow seasons and bag limits provided by CPW.
- The refuge manager would have the ability to close or modify entire hunting programs, including access, timing, and methods, in response to unforeseen conditions in order to ensure public safety and best management of natural resources.
- Refuge staff would regularly solicit feedback from hunters regarding safety, the overall quality of their hunting experience, and any suggestions they may have.

### **Justification**

Consistent with our habitat management plan (HMP), there may be a need to manage big game populations on the refuge. The Rocky Mountain Arsenal National Wildlife Refuge Act of 1992 specifically encourages fish and wildlife recreational opportunities, and hunting is one of the wildlife-dependent recreational activities that is encouraged on national wildlife refuges. The refuge also provides a unique venue for hunter education and the exposure of youth to quality hunting opportunities, as defined in the Service's guidelines for wildlife-dependent recreation (FWS 2006b). Under this policy, providing quality experiences is highlighted as an important component of a hunting program (605 FW1, 605FW2). Promoting safety, providing reasonable opportunities for success, and working collaboratively with the State wildlife agencies are just a few of the key elements that should be considered in providing for quality experiences. For example, a quality experience could mean that participants could expect reasonable harvest opportunities, uncrowded conditions, few conflicts between hunters, relatively undisturbed wildlife, and limited interference from or dependence on mechanized aspects of the sport.

*Mandatory 15-year reevaluation date: 2030*

## Fishing

Even prior to the establishment of the refuge, fishing had been a cherished wildlife-dependent recreational opportunity at this site. Over the years, there have been periodic changes to the timing and location of fishing. Fishing is now allowed on Lake Mary and Lake Ladora; it is not allowed on other lakes on the refuge.

Current sport fishing regulations (50 CFR § 32.25) state that fishing be catch and release, requires a permit, and is permitted from sunrise to sunset from April 15 through October 15 annually. Additional conditions are found in the refuge's fishing permit and are modified periodically. Wading is permitted, but the use of boats and other flotation devices is prohibited.

### Anticipated Impacts of Use

Fishing occurs in artificial, warm-water lakes on the refuge. The lakes were originally created as irrigation infrastructure and now support a warm-water recreational fishery. All fishing is for warm-water species such as largemouth bass, sunfish, northern pike, and catfish. In accordance with our HMP, fisheries are monitored and stocked to provide a quality sportfishing experience focusing on angler satisfaction. Infrastructure that localizes habitat disturbance and impacts has already been created to support recreational fishing. Our lakes also support a variety of waterfowl and shorebirds and provide needed forage for bald eagles that overwinter at the refuge. Our season (April 15 through October 15) limits fishing-related disturbances to other wildlife.

### Availability of Resources

We currently have a full-time law enforcement officer to help administer the fishing program. Other staff and volunteers assist in monitoring fisheries and with special fishing programs.

### Determination

Fishing and fishing programs are compatible uses of the Rocky Mountain Arsenal National Wildlife Refuge.

### Stipulations Necessary to Ensure Compatibility

- All fishing will require a permit.

- The majority of lakes on the refuge are interconnected and near one another. A fishing season (April 15 through October 15) would limit disturbance to waterfowl, shorebirds, and bald eagles.
- The size and number of fish in our lakes is limited by the lakes' size. To ensure a quality fishing experience, as defined by angler satisfaction and average catch rates, catch-and-release fishing would be needed.
- Illegal activities, including fishing violations, would be reduced by providing well-thought-out information and sufficient law enforcement presence.
- Periodic monitoring of the health and composition of our fisheries would be required. Stocking of both sport and forage fish may be required.
- All fishing programs would be coordinated with CPW.
- The refuge manager would have the ability to close or modify entire fishing programs, including access, timing, and methods, in response to unforeseen conditions to ensure public safety and the best management of natural resources.
- Refuge staff would regularly solicit feedback from those who fish regarding the safety and overall quality of their fishing experience and would solicit suggestions for improvement.

### Justification

The Rocky Mountain Arsenal National Wildlife Refuge Act of 1992 specifically encourages fish and wildlife recreational opportunities, and fishing is one of the wildlife-dependent recreational activities encouraged on national wildlife refuges. Due to the refuge's location in a major urban area, fishing is very accessible and is consistent with our goals for connecting with urban populations. Both the refuge's HMP and aquatic management stepdown plan (FWS 2006a) provide goals and strategies for managing lacustrine habitats and providing quality sport fishery on individual lakes. There are only minor costs associated with this program. The majority of costs are recouped through the collection of fishing permit fees.

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## Wildlife Observation, Photography, Interpretation, and Environmental Education

The Improvement Act identifies six wildlife-dependent recreational activities as priority public uses and encourages their implementation on refuges when they are found compatible with refuge purposes and when adequate resources are available to manage these activities on refuge lands. This compatibility determination considers wildlife observation, photography, interpretation, and environmental education. The compatibility of the other two activities identified in the Act, hunting and fishing, are assessed above.

Compatible access for priority public uses would be improved on the refuge. The majority of infrastructure is already in place and would no longer be restricted to public use. Modes of access that facilitate wildlife-dependent uses—walking, jogging, cross-country skiing, snowshoeing, and bicycles—would be favored in the refuge’s Environmental Education Zone. Due to the presence of wild bison, vehicle use would be favored in the native prairie areas of the refuge. As needed, seasonal closures would be used to limit disturbances to wildlife.

Additional trails or viewing platforms could be considered to enhance viewing opportunities. Limited commercial opportunities such as nature programming, tours, and photography could be considered.

Specifically:

- Several existing administrative roads would be converted to act as new bicycle and pedestrian trails providing new access to the refuge from surrounding communities.
- A new bicycle and pedestrian trail would be constructed through the Environmental Education Zone. The primary purpose of this trail is to reduce safety risks between vehicles and nonmotorized modes of transportation, but the trail would also provide a connection across the refuge to adjoining trail systems.
- A new accessible trail would be constructed from Lower Derby Lake to the Rod and Gun Pond viewing blind.
- Both auto tour routes would be opened to the public. The Legacy Loop would be open for all modes of transportation and Wildlife Drive would be open for vehicular use.

- Several new parking areas, trails, and observation platforms would be constructed to improve transportation and provide opportunities for wildlife observation and photography.
- The Wildlife Watch area, previously known as the Eagle Watch, would be reopened and rehabilitated for wildlife viewing and photography access.
- The road to Rattlesnake Hill and accessible trails in this area would be reopened to the public.
- The current environmental education facilities near Lake Mary would be improved.

### Anticipated Impacts of Use

The proposed changes seek to better accommodate increasing public use. Additional wildlife disturbance could occur from opening auto tour routes, opening areas to nonmotorized access, expanding wildlife-viewing nature trails, and providing new access to surrounding communities and existing trail systems. Repurposing and improving existing facilities would result in no direct impact, but would likely further increase use.

Increased human presence on the refuge would have impacts on wildlife. There is both inter- and intraspecific variation among wildlife species, especially habitat specialists, which are more susceptible than others to human disturbance. Research has shown that human presence associated with roads and trails can result in a simplification of avian communities (fewer specialists and more generalists), reduced nest success, and reduced habitat quality. Many species are more likely to flush with increased human presence, resulting in less time spent foraging, with a potentially adverse effect on building suitable energy reserves for egg laying and migration; food delivery rates to young; territory establishment and defense; and mate attraction. For many species, especially medium-sized and large mammals, the presence of dogs can greatly magnify the effects of disturbance. Research has shown that various activities result in differing levels of disturbance. Pedestrian and bicycle use results in greater disturbance than vehicle use. Trails and roads create habitat edges, which lead to increased predation, parasitism, and displacement of interior-sensitive birds. Trails and roads can restrict animal movement and dispersal.

Increasing public use of the refuge would require a corresponding increase in law enforcement resources to ensure public safety.

## Availability of Resources

We currently have a full-time law enforcement officer to monitor and enforce refuge regulations. Other staff and volunteers would assist with providing information to the public on wildlife disturbance and monitoring of impacts.

## Determination

Wildlife interpretation, environmental education, wildlife photography, and wildlife observation are compatible uses of the Rocky Mountain Arsenal National Wildlife Refuge.

## Stipulations Necessary to Ensure Compatibility

- Monitoring of focal or surrogate species would be used to ascertain adverse effects on wildlife associated with increased public use on the refuge.
- Dogs would not be allowed out of vehicles on the refuge.
- Visitors on the wildlife observation trails would be required to stay on the trail.
- For safety around bison, visitors on the larger auto tour route would be restricted to their vehicles or the immediate areas outside their vehicles.
- Visitors would not be allowed within our bald eagle management areas or other sensitive habitat during critical periods of the year.
- Existing infrastructure (administrative roads and trails) and footprints would be used as much as possible in the expansion of nonmotorized access to the refuge, reducing ground disturbance, associated habitat loss, and the spread of weeds.
- The refuge manager would have the ability to close or modify any activity, including access, timing, and methods, in response to unforeseen conditions in order to ensure public safety and the best management of natural resources.
- Interpretive information would be posted and included in refuge brochures describing

the impact of disturbance on wildlife and simple practices for the visitor to reduce disturbance.

## Justification

The urban location, accessibility, and abundant wildlife resources found on the refuge attract many visitors. At present, our bison herd is the largest draw. Historically, access for visitors wanting to participate in nonconsumptive recreation on the refuge has been limited. The Rocky Mountain Arsenal National Wildlife Refuge Act of 1992 specifically encourages wildlife-dependent recreational opportunities and environmental education. Wildlife observation, photography, interpretation, and environmental education are wildlife-dependent recreational activities that are encouraged on national wildlife refuges. It is the intent of this determination and the CCP to provide well-thought-out and desirable access opportunities without materially interfering with achievement of refuge wildlife management goals.

*Mandatory 15-year reevaluation date: 2030*

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## Commercial Photography

For many years, the refuge has issued special use permits for commercial photography. Due to our relatively easy access to wildlife, demand for these permits is high. Our permits often provide access to areas of the refuge that are generally closed to the public, but this will occur less as more areas of the refuge are opened to the public.

Commercial filming is defined as the digital recording or filming of a visual image or sound recording by a person, business, or other entity for a market audience, such as for a documentary, television or feature film, advertising, or similar project. It does not include news coverage or visitor use. Still photography is defined as the capturing of a still image on film or in a digital format. These descriptions and further information about these activities are found in 43 CFR Part 5 (Department of the Interior) and 50 CFR Part 27 (Fish and Wildlife Service).

Under the Code of Federal Regulations (50 CFR § 27.71), special use permits for commercial filming and still photography are required when

- it takes place at location(s) where or when members of the public are generally not allowed; or (2) it uses model(s), sets(s), or prop(s) that are not a part of the location's natural or cultural resources or administrative facilities; or (3) the agency would incur

additional administrative costs to monitor the activity; or (4) the agency would need to provide management and oversight to:

- i. avoid impairment or incompatible use of the resources and values of the site; or
- ii. limit resource damage; or
- iii. minimize health or safety risks to the visiting public.

These permit requests are evaluated on an individual basis, using a number of Department of the Interior, Service, and National Wildlife Refuge System policies (for example, 43 CFR Part 5, 50 CFR Part 7, 8 RM 16). Commercial filming would be managed on the refuge through the special use permitting process to minimize the possibility of damage to cultural or natural resources or interference with other visitors to the area.

### ***Anticipated Impacts of Use***

Wildlife photography can adversely affect wildlife by altering wildlife behavior, reproduction, distribution, and habitat (Knight and Cole 1995; Purdy et al. 1987). Of the wildlife observation techniques, photographers tend to have the largest disturbance impacts (Dobb 1998; Klein 1993; Morton 1995). While wildlife observers frequently stop to view species, wildlife photographers are more likely to approach wildlife (Klein 1993). Even a slow approach by photographers tends to have behavioral consequences to wildlife species (Klein 1993). Other impacts include the potential for photographers to remain close to wildlife for extended periods of time in an attempt to habituate the wildlife subject to their presence (Dobb 1998) and the tendency of casual photographers, with low-power lenses, to get much closer to their subjects than other activities would require (Morton 1995), including wandering off trails. This usually results in increased disturbance to wildlife and habitat, including trampling of plants. Klein (1993) recommended that refuges provide observation and photography blinds to reduce disturbance to wildlife that can result from approach by visitors. Potential impacts from this use include purposeful or inadvertent disturbance of wildlife. Large commercial activities could also interfere with priority public uses.

Special use permit conditions and associated monitoring of permitted activities would be designed to minimize wildlife and habitat impacts of this use. A special use permit request would be denied if the commercial filming, audio recording, or still photography activities are found not to be compatible with refuge purposes.

### ***Availability of Resources***

We currently have a full-time law enforcement officer to monitor compliance of permittees. The refuge would incur minimal expense for administrative costs for review of applications and issuance of a special use permit. Special use permits for commercial filming and still photography would require payment of a location fee and reimbursement for actual costs incurred in processing the permit request and administering the permit.

### ***Determination***

Commercial filming, audio recording, and still photography are compatible uses of the Rocky Mountain Arsenal National Wildlife Refuge.

### ***Stipulations Necessary to Ensure Compatibility***

- All commercial filming would require a special use permit.
- Special use permits would identify conditions that protect the refuge's values, purposes, and resources; ensure public health and safety; and prevent unreasonable disruption of the public's use and enjoyment of the refuge. Such conditions may include specifying road conditions when access would not be allowed, establishing time limitations, and identifying routes of access into refuges. These conditions would be identified to prevent excessive disturbances to wildlife, damage to habitat or refuge infrastructure, or conflicts with other visitor services or management activities.
- The special use permit would stipulate that imagery produced on refuge lands would be made available to the refuge to use in environmental education and interpretation, outreach, internal documents, or other suitable uses. In addition, any commercial products must include appropriate credits to the refuge, the Refuge System, and the Service.
- Any commercial filming, still photography, or audio recording permits that are requested must demonstrate a means to extend public appreciation and understanding of wildlife or natural habitats; to enhance education, appreciation, and understanding of the Refuge System; or to facili-

tate outreach and education goals of the refuge.

- Aerial filming or photography of wildlife may result in disturbance of animals in violation of applicable regulations.
- Still photography and audio recording would also require a special use permit (with specific conditions as outlined above) under one or more of the following conditions:
  - It would occur in places where or when members of the public are not allowed.
  - It would use model(s), set(s), or prop(s) that are not part of the location's natural or cultural resources or administrative facilities.
  - The refuge would incur additional administrative costs to monitor the activity.
  - The refuge would need to provide management and oversight to avoid impairment of the resources and values of the site; limit resource damage; or minimize health and safety risks to the visiting public.
  - The photographer(s) would intentionally manipulate vegetation to create a shot (for example cutting vegetation to create a blind).
  - To reduce impacts on refuge lands and resources, refuge staff would ensure that all commercial filmmakers, commercial still photographers, and commercial audio recorders comply with policies, rules, and regulations, and refuge staff would monitor and assess the activities of all filmmakers, photographers, and audio recorders.

### **Justification**

Commercial filming, still photography, or audio recording are economic uses that must contribute to the achievement of the refuge purposes, the mission of the Refuge System, or the mission of the Service. Under certain circumstances, providing opportunities for commercial filming, still photography, and audio recording that meet the above requirements should result in increased public awareness of the refuge's ecological importance as well as advancing the public's knowledge and support for the Refuge System and the Service. The stipulations outlined above and conditions imposed in the special use permits issued to commercial filmmakers, still photogra-

phers, and audio recorders would ensure that these wildlife-dependent activities occur without adverse effects on refuge resources or refuge visitors.

*Mandatory 15-year reevaluation date: 2030*

## **Research**

The refuge occasionally receives requests to conduct research. Recent examples include projects assessing the effects of bison grazing, efficacy of plague vaccines, and the use of geolocators on burrowing owls. Priority would be given to studies that contribute to the enhancement, protection, preservation, and management of native plants, fish, wildlife populations, and habitat on the refuge. Research applicants must submit a proposal that outlines (1) the objectives of the study; (2) the justification for the study; (3) a detailed study methodology and schedule; and (4) potential impacts on refuge wildlife and habitat, including disturbance (short- and long-term), injury, or mortality. This proposal must include (1) a description of mitigation measures the researcher would take to reduce disturbances or impacts; (2) personnel required and their qualifications and experience; (3) status of necessary permits (such as scientific collecting permits and endangered species permits); (4) costs to refuge and refuge staff time requested, if any; and (5) product delivery schedules such as anticipated progress reports and end products such as reports or publications. Refuge staff and others, as appropriate, would review research proposals and issue special use permits if approved.

Evaluation criteria would include the following:

- Research that would contribute to specific refuge management issues would be given higher priority than other requests.
- Research that would conflict with other ongoing research, monitoring, or management programs would not be approved.
- Research projects that can be conducted off-refuge would be less likely to be approved.
- Research that causes undue disturbance or is intrusive would likely not be approved. The degree and type of disturbance would be carefully weighed when evaluating a research request.
- Evaluation of the research proposal would determine if any effort has been made to reduce disturbance through study design, including adjusting location, timing, number

of permittees, study methods, and number of study sites.

- Evaluation of the research proposal would determine if any mitigation planning is included to minimize disturbances or impacts or to reclaim resultant disturbed areas.
- Evaluation of the research proposal would determine if staffing or logistics makes it impossible for the refuge to monitor researcher activity in a sensitive area.
- Specific timelines, including the length of the project and product delivery dates, would be considered and agreed upon before approval. All projects would be reviewed annually.

### ***Anticipated Impacts of Use***

Some degree of disturbance is expected with all research activities, since they often include areas of the refuge closed to the public or with limited public access, and some research requires collecting samples from, or the direct handling of, wildlife. However, minimal impacts on refuge wildlife and habitats are expected to result from research studies because special use permits would specify conditions to ensure that impacts on wildlife and habitats are reduced.

### ***Availability of Resources***

We currently have staff to review and evaluate these requests. Our experience shows us that the nominal cost of issuing special use permits and managing research projects is typically offset by the value of information acquired from the research.

### ***Determination***

Research is a compatible use of the Rocky Mountain Arsenal National Wildlife Refuge.

### ***Stipulations Necessary to Ensure Compatibility***

- All research would require a special use permit.
- Special use permits would identify the conditions that protect the refuge's values, purposes, and resources; ensure public health

and safety; and prevent unreasonable disruption of the public's use and enjoyment of the refuge. Such conditions may include specifying road conditions when access would not be allowed, establishing time limitations, and identifying routes of access into refuges. These conditions would be identified to prevent excessive disturbances to wildlife, damage to habitat or refuge infrastructure, or conflicts with other visitor services or management activities.

- Extremely sensitive wildlife habitat areas and wildlife species would be provided sufficient protection from disturbance by limiting proposed research activities in these areas. All refuge rules and regulations would be strictly enforced unless otherwise exempted by refuge management.
- Refuge staff would use the criteria for evaluating a research proposal, as outlined above, when determining whether to approve a proposed study on the refuge. If proposed research methods are evaluated and determined to have potential impacts on refuge resources (habitat and wildlife), it must be demonstrated that the research is necessary for refuge resource conservation management. Measures to reduce potential impacts would need to be developed and included as part of the study design. In addition, these measures would be listed as conditions and requirements of the special use permit.
- Refuge staff would monitor research activities for compliance with conditions of the special use permit. At any time, refuge staff may accompany the researchers to determine potential impacts. Staff may determine that previously approved research and special use permits should be terminated based on observed impacts. The refuge manager would also have the ability to cancel a special use permit if the researcher is out of compliance, or to ensure wildlife and habitat protection.

### ***Justification***

The Rocky Mountain Arsenal National Wildlife Refuge Act of 1992 specifically includes research as a purpose for the refuge. The program as described is determined to be compatible. Potential impacts of research activities on refuge resources would be reduced because sufficient restrictions would be

included in the required special use permits and all activities would be monitored by refuge staff. At a minimum, research activities would have no significant impact on refuge resources and are expected to contribute to the enhancement, protection, preservation, and management of refuge wildlife populations and their habitats.

*Mandatory 15-year reevaluation date: 2030*

## Refuge Perimeter Trail

The idea of a nonmotorized trail following the 26-mile perimeter of the refuge was first envisioned in the refuge's comprehensive management plan (FWS 1996a). Over time, much of this trail has been constructed, and the remainder necessary for completion is still proposed and underway. The majority of this trail is on lands immediately adjacent to the refuge, but not owned by the refuge. There are small sections of the trail that must cross refuge lands.

### Anticipated Impacts of Use

The construction of trails would have an immediate and temporary impact. Once constructed, increased human presence would have impacts on wildlife. However, the majority of the perimeter trail exists solely on the periphery of wildlife habitat.

### Availability of Resources

The City of Commerce City maintains the portions of the trail that it has constructed in Commerce City and Adams County. Future trail segments will be constructed on City of Denver lands, and maintenance and upkeep will be the City of Denver's responsibility. There will be limited costs involved in the maintenance and upkeep of the perimeter trail system.

### Determination

Construction and maintenance of a perimeter trail is a compatible use of the Rocky Mountain Arsenal National Wildlife Refuge.

### Stipulations Necessary to Ensure Compatibility

- All activities must be limited to nonmotorized use to reduce or eliminate disturbance of refuge wildlife and visitors.

### Justification

The Rocky Mountain Arsenal National Wildlife Refuge Act of 1992 specifically encourages wildlife-dependent recreational opportunities. The perimeter trail provides necessary access to the refuge and creates important connections to other trail networks.

*Mandatory 15-year reevaluation date: 2030*

## B.4 Approval of Compatibility Determinations

Submitted by:

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David Lucas, Project Leader  
U.S. Fish and Wildlife Service  
Rocky Mountain Arsenal NWR  
Commerce City, Colorado

Date

Reviewed by:

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Barbara Boyle, Refuge Supervisor  
U.S. Fish and Wildlife Service  
National Wildlife Refuge System  
Lakewood, Colorado

Date

Approved by:

---

Will Meeks, Assistant Regional Director  
U.S. Fish and Wildlife Service  
National Wildlife Refuge System  
Lakewood, Colorado

Date



# Appendix C

## *Rocky Mountain Arsenal National Wildlife Refuge Act of 1992*

Public Law 102-402  
102d Congress

PUBLIC LAW 102-402—OCT. 9, 1992

106 STAT. 1961-1967

Oct. 9, 1992  
[H.R. 1435]

### An Act

To direct the Secretary of the Army to transfer jurisdiction over the Rocky Mountain Arsenal, Colorado, to the Secretary of the Interior.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

#### **SECTION 1. SHORT TITLE AND DEFINITIONS.**

(a) **SHORT TITLE.**—This act may be cited as the “Rocky Mountain Arsenal National Wildlife Refuge Act of 1992.”

(b) **DEFINITIONS.**—For purposes of this Act:

(1) The term “Arsenal” means the Rocky Mountain Arsenal in the State of Colorado.

(2) The term “refuge” means the Rocky Mountain Arsenal National Wildlife Refuge established pursuant to section 4(a)

(3) The term “hazardous substance” has the meaning given such term by section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9601 (14)).

(4) The term “pollutant or contaminant” has the meaning given such term by section 101(33) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9601(14)).

(5) The term “response action” has the meaning given the term “response” by section 101(25) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9601(25)).

(6) The term “person” has the meaning given that term by section 101(21) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9601(21)).

#### **SEC. 2 TRANSFER OF MANAGEMENT RESPONSIBILITIES AND JURISDICTION OVER THE ROCKY MOUNTAIN ARSENAL.**

(a) **TRANSFER OF MANAGEMENT RESPONSIBILITIES.**—(1) Not later than October 1, 1992, the Secretary of the Army and the Secretary of the Interior shall enter into a memorandum of understanding under which—

(A) the Secretary of the Army shall transfer to the Secretary of the Interior, without reimbursement, all responsibility to manage for wildlife and public use purposes the real property comprising the Rocky Mountain Arsenal in the State of Colorado, except the property and facilities required to be retained under subsection (c) or designated for disposal under section 5; and

(B) The Secretary of the Interior shall manage that real property as if it were a unit of the National Wildlife Refuge System established for the purposes provided in section 4. (2) The management of the property by the Secretary of the Interior shall be subject to (A) any response action at the Arsenal carried out by or under that authority of the Secretary of the Army under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9601 et seq.) and other applicable provisions of law, and (B) any action required under any other statute to remediate petroleum products or their derivatives (including motor oil and aviation fuel) carried out by or under the authority of the Secretary of the Army. In the case of any conflict between management of the property by the Secretary of the Interior and any such response action or other action, the response action or other action shall take priority.

(b) TRANSFER OF JURISDICTION.—(1) Upon receipt of the certification described in paragraph (2), the Secretary of the Army shall transfer to the Secretary of the Interior jurisdiction over the real property comprising the Arsenal, except the property and facilities required to be retained under subsection (c) or designated for disposal under section 5. The transfer shall be made without cost to the Secretary of the Interior and shall include such improvements on the property as the Secretary of the Interior may request in writing for refuge management purposes.

(2) The transfer of real property under paragraph (1) may occur only after the Administrator of the Environmental Protection Agency certifies to the Secretary of the Army that response action required at the Arsenal and any action required under any other statute to remediate petroleum products or their derivatives (including motor oil and aviation fuel) at the Arsenal have been completed, except operation and maintenance associated with those actions.

(3) The exact acreage and legal description of the real property subject to transfer under paragraph (1) shall be determined by a survey mutually satisfactory to the Secretary of the Army and the Secretary of the Interior. The Secretary of the Army shall bear any costs related to the survey.

(c) PROPERTY AND FACILITIES EXCLUDED FROM TRANSFERS.—

(1) PROPERTY USED FOR ENVIRONMENTAL CLEANUP PURPOSES.—The Secretary of the Army shall retain jurisdiction, authority, and control over all real property at the Arsenal to be used for water treatment; the treatment, storage, or disposal of hazardous substances, pollutants, or contaminants; or other purposes related to response action at the Arsenal and any action required under any other statute to remediate petroleum products or their derivatives (including motor oil and aviation fuel) at the Arsenal. The Secretary of the Army shall consult with the Secretary of the Interior regarding the identification and management of all real property retained under this paragraph and ensure that activities carried out on that property are—

(A) consistent with the purposes for which the refuge is to be established under section 4(c), to the extent practicable; and

(B) consistent with the provisions of sections 2(a)(2) and 4(e).

(2) PROPERTY USED FOR LEASE OF PUBLIC FACILITIES.—(A) The Secretary of the Army shall retain jurisdiction, authority, and control over the following real property at the Arsenal:

(i) Approximately 12.08 acres containing the South Adams County Water Treatment Plant and described in Department of the Army lease No. DACA 45-1-87-6121.

(ii) Approximately 63.04 acres containing a United States Postal Service facility and described in Department of the Army lease No. DACA 45-4-71-6185.

(B) Nothing in this Act shall affect the validity or continued operation of leases of the Department of the Army in existence on the date of the enactment of this act and involving the property described in subparagraph (A)

### **SEC. 3. CONTINUATION OF RESPONSIBILITY AND LIABILITY OF THE SECRETARY OF THE ARMY FOR ENVIRONMENTAL CLEANUP.**

(a) RESPONSIBILITY.—Notwithstanding the memorandum of understanding required under section 2(a), the Secretary of the Army shall, with respect to the real property at the Arsenal that is subject to the memorandum, continue to carry out (1) response action at that property under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9601 et seq.) and other applicable provisions of law, and (2) any action required under any other statute to remediate petroleum products or their derivatives (including motor oil and aviation fuel). The management by the Secretary of the Interior of such real property shall be subject to any such response action or other action at the property being carried out by or under the authority of the Secretary of the Army under such provisions of law.

(b) LIABILITY.—(1) Nothing in this Act shall relieve, and no action may be taken under this Act to relieve, the Secretary of the Army or any other person from any obligation or other liability at the Arsenal under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9601 et seq.) and other applicable provisions of law. (2) After the transfer of jurisdiction under section 2(b), the Secretary of the Army shall retain any obligation or other liability at the Arsenal under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9601 et seq.) and other applicable provisions of law and shall be accorded all easements and access as may be reasonably required to carry out such obligation or other liability.

(c) DEGREE OF CLEANUP.—Nothing in this Act shall be construed to restrict or lessen the degree of cleanup at the Arsenal required to be carried out under applicable provisions of law.

(d) **PAYMENT OF RESPONSE ACTION COSTS.**—Any Federal department or agency that had or has operations at the Arsenal resulting in the release or threatened release of hazardous substance, pollutants, or contaminants shall pay the cost of related response actions or related actions under other statutes to remediate petroleum products or their derivatives, including motor oil and aviation fuel.

(e) **CONSULTATION.**—In carrying out response actions at the Arsenal, the Secretary of the Army shall consult with Secretary of the Interior to ensure that such actions are carried out in a manner—

(1) to the extent practicable, consistent with the purposes set forth in section 4(c) for which the refuge will be established after the certification required under section 2(b)(2); and

(2) consistent with the provisions of sections 2(a)(2) and 4(e).

(f) **EXISTING LAW.**—The Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), the Migratory Bird Treaty Act (16 U.S.C. 703 et seq.), and the Bald Eagle Protection Act (16 U.S.C. 668 et seq.) shall apply to all actions at the Arsenal.

(g) **RESPONSE ACTIONS.**—(1) The future establishment of the refuge shall not restrict or lessen in any way any response action or degree of cleanup under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 or other applicable provisions of law, or any response action required under any other statute to remediate petroleum products or their derivatives (including motor oil and aviation fuel), required to be carried out by or under the authority of the Secretary of the Army at the arsenal and surrounding areas, including areas, including (but not limited to)—

(A) the substance or performance of the remedial investigation and feasibility study or endangerment assessments;

(B) the contents and conclusions of the remedial investigation and feasibility study or the endangerment assessment reports; or

(C) the selection and implementation of response action and any action required under any other statute to remediate petroleum products or their derivatives (including motor oil and aviation fuel) for the Arsenal and surrounding areas.

(2) All response action and action required under any other statute to remediate petroleum products or their derivatives (including motor oil and aviation fuel) carried out at the Arsenal shall attain a degree of cleanup of hazardous substances, pollutants, and contaminants that, at a minimum, is sufficient to full meet the purposes set forth in section 4(c) for which the refuge will be established and the permit access to all real property comprising the refuge by refuge personnel, wildlife researchers, and visitors.

#### **SEC. 4. ESTABLISHMENT OF THE ROCKY MOUNTAIN ARSENAL NATIONAL WILDLIFE REFUGE.**

(a) **ESTABLISHMENT.**—Not later than 30 days after the transfer of jurisdiction under section 2(b), the Secretary of the Interior shall establish a national wildlife refuge that shall be known as the Rocky Mountain Arsenal National Wildlife Refuge and consist of the real property required to be transferred under such section. The Secretary of the Interior shall publish a notice of the establishment of the refuge in the Federal Register.

(b) **ADMINISTRATION.**—

(1) **IN GENERAL.**—The Secretary of the Interior shall manage the refuge in accordance with the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd et seq.) and other applicable law.

(2) **CONSULTATION.**—In developing plans for the management of fish and wildlife at and public use of the refuge, the Secretary of the Interior shall—

(A) consult with the Colorado Department of Natural Resources and local governments adjacent to the refuge; and

(B) provide an opportunity for public comment on such plans.

(3) The Secretary of the Interior and the Administrator of the Federal Aviation Administration shall confer from time to time as necessary to coordinate the management of the refuge with the operations of the Denver International Airport.

(c) **PURPOSES OF THE REFUGE.**—The refuge is established for the following purposes:

(1) To conserve and enhance populations of fish, wildlife, and plants within the refuge, including populations of waterfowl, raptors, passerines, and marsh and water birds.

(2) To conserve species listed as threatened or endangered under the Endangered Species Act and species that are candidates for such listing.

(3) To provide maximum fish and wildlife oriented public uses at levels compatible with the conservation and enhancement of wildlife and wildlife habitat.

(4) To provide opportunities for compatible scientific research.

(5) To provide opportunities for compatible environmental and land use education

(6) To conserve and enhance the land and water of the refuge in a manner that will conserve and enhance the natural diversity of fish, wildlife, plants and their habitats.

(7) To protect and enhance the quality of aquatic habitat within the refuge.

(8) To fulfill international treaty obligations of the United States with respect to fish and wildlife and their habitats.

(d) LIMITATIONS.—

(1) PROHIBITION AGAINST ANNEXATION.—Notwithstanding section 4(a)(2) of the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd(a)(2)), the Secretary of the Interior shall not allow the annexation of lands within the refuge by any unit of general local government.

(2) PROHIBITION AGAINST THROUGH ROADS.—Public roads may not be constructed through the refuge.

## **SEC. 5. DISPOSAL OF CERTAIN REAL PROPERTY AT THE ARSENAL FOR COMMERCIAL, HIGHWAY, OR OTHER PUBLIC USE.**

(a) PROPERTY DESIGNATED FOR DISPOSAL UNDER THIS SECTION.—The following areas of real property at the Arsenal are designated for disposal under this section for commercial, highway, or other public use purposes:

(1) An area of real property consisting of approximately 815 acres located at the Arsenal, the approximate legal description of which is section 9, T3S-R67W, and the W2W2 of section 4, the W4E2W2 of section 4, T3S-R67W, and the SW4SW4 of section 33, the W4E2W2 of section 33, and the W2NW4 of section 33, T2SR67W; except that the area designated shall not include the approximately 63.04 acres containing a United States Postal Service facility and described in Department of the Army lease No. DACA 45-4-71-6185 and the water wells located in buildings 385, 386, and 387 at the Arsenal and associated facilities and easements necessary to operate and maintain the water wells, which shall be treated in the manner provided in section 2.

(2) To permit the widening of existing roads, an area of real property of not more than 100 feet inside the boundary of the Arsenal on—

(A) the Northwest side of the Arsenal adjacent to Colorado Highway #2;

(B) the Northern side of the Arsenal adjacent to 96th Avenue; and

(C) the Southern side of the Arsenal adjacent to 56th Avenue.

(b) TRANSFER FOR HIGHWAY PURPOSES.—The Secretary of the Army shall convey those parcels of real property described in subsection (a)(2) to the State or the appropriate unit of general local government at no cost to allow for the improvement of public roads in existence on the date of the enactment of this Act or for the provision of alternative means of transportation.

(c) TRANSFER FOR SALE.—(1) The Secretary of the Army shall transfer to the Administrator of the General Services Administration those parcels of the area of real property described in subsection (a)(1). The transferred property shall be sold in advertised sales as surplus property under the provision of the Federal Property and Administrative Services Act of 1949 (40 U.S.C. 471 et seq.), except that the provisions of such Act relating to reduced- or no cost transfers to other governmental entities shall not apply to this property.\*

(2) Any amounts realized by the United States upon the sale of property as described in paragraph (1) shall be transferred to the Director of the United States Fish and Wildlife Service to be used, to the extent provided for in appropriation Acts, to supplement the funds otherwise available for construction of a visitor and education center at the refuge.

(d) LIMITATIONS.—

(1) PERPETUAL RESTRICTIONS.—(A) The disposal of real property under this section shall be subject to perpetual restrictions that are attached to any deed to such property and that prohibit—

(i) the use of the property for residential or industrial purposes;

(ii) the use of ground water located under, or surface water located on, the property as a source of potable water;

(iii) hunting and fishing on the property, excluding hunting and fishing for nonconsumptive use subject to appropriate restrictions; and

(iv) agricultural use of the property, including all farming activities such as the raising of livestock, crops, or vegetables, but excluding agricultural practices used in response action or used of or erosion control.

(B) Nothing in subparagraph (A) shall be construed to restrict or lessen the degree of cleanup required to be carried out under applicable provisions of law at the property designated for disposal under this section.

(2) DISPOSAL IN ACCORDANCE WITH CERCLA.—The disposal of real property under this section shall be carried out in compliance with section 120(h) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9620(h)) and other applicable provisions of law.

Approved October 9, 1992.

\* The National Defense Authorization Act of 1998 (Public Law 105-85) replaced the second sentence with “Section 5(c)(1) of Public Law 102-402 (106 Stat. 1966; 16 U.S.C. 668dd note) is amended by striking out the second sentence: ‘The Administrator shall convey the transferred property to Commerce City, Colorado for consideration in an amount equal to the fair market value of the property (as determined jointly by the Administrator and the City).’”



# Appendix D

## Visitor Projections

In April 2014, to assist with this plan, refuge staff developed some projections of future visitation. The following assumptions were used in this exercise:

- Alternative A (no action)—Under this alternative, we expect no significant changes to infrastructure or opportunities, but we still expect an increase in visitation due to word of mouth. Visitation would increase in a linear fashion from the current 300,000 visitors per year.
- Alternative B (traditional refuge)—Under this alternative, we expect minor increases in infrastructure and opportunities with a minor annual increase in visitation and a minor annual increase in programming.
- Alternative C (urban refuge)—Under this alternative, our focus is on increasing opportunities onsite with some offsite work resulting in rather dramatic annual increases in visitation (8 percent annually—exponential).
- Alternative D (gateway refuge)—Under this alternative, we focus on offsite opportunities, and visitation would be similar to alternative B (4 percent annually). It is not possible to model the collective impact of visitation in this alternative.

Using these assumptions, we calculated visitor projections; these are shown in the table D-1.

In addition, because we have seen visitation change dramatically with each change in program-

**Table D-1. Initial visitor projections.**

<i>Alternative</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	
2013	300,000	300,000	300,000	300,000	
2014	315,000	325,000	330,000	320,000	
2015	330,000	350,000	360,000	340,000	Implement
2016	345,000	375,000	388,800	353,600	
2017	360,000	400,000	419,904	367,744	
2018	375,000	425,000	453,496	382,454	
2019	390,000	450,000	489,776	397,752	
2020	405,000	475,000	528,958	413,662	
2021	420,000	500,000	571,275	430,208	
2022	435,000	525,000	616,977	447,417	
2023	450,000	550,000	666,335	465,313	
2024	465,000	575,000	719,642	483,926	
2025	480,000	600,000	777,213	503,283	
2026	495,000	625,000	839,390	523,414	
2027	510,000	650,000	906,541	544,351	
2028	525,000	675,000	979,065	566,125	
2029	540,000	700,000	1,057,390	588,770	Year 15
2030	555,000	725,000	1,141,981	612,321	
2031	570,000	750,000	1,233,339	636,814	
2032	585,000	775,000	1,332,006	662,286	
2033	600,000	800,000	1,438,567	688,778	
2034	615,000	825,000	1,553,652	716,329	Year 20

ming and opportunity (for example, opening the auto tour route), we also calculated visitor projections with the following assumptions: adding only a handful of new opportunities under alternative B, increasing opportunities every year or so under alternative C, and providing fewer opportunities under alternative D. Projections are shown in table D-2.

To calculate final visitation projections, we simply used averaged the projections generated by the two methods described above. Final projects are shown in table D-3.

**Table D-2. Revised visitor projections.**

<i>Alternative</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	
2013	300,000	300,000	300,000	300,000	
2014	300,000	300,000	300,000	300,000	
2015	300,000	350,000	450,000	325,000	Implement
2016	300,000	350,000	500,000	325,000	
2017	300,000	350,000	550,000	375,000	
2018	300,000	350,000	550,000	425,000	
2019	300,000	400,000	550,000	425,000	
2020	300,000	400,000	550,000	425,000	
2021	300,000	400,000	750,000	425,000	
2022	300,000	400,000	750,000	425,000	
2023	300,000	400,000	750,000	425,000	
2024	300,000	400,000	750,000	500,000	
2025	300,000	400,000	850,000	500,000	
2026	300,000	450,000	850,000	550,000	
2027	300,000	450,000	850,000	600,000	
2028	300,000	450,000	1,000,000	600,000	
2029	300,000	450,000	1,000,000	600,000	Year 15
2030	300,000	450,000	1,000,000	600,000	
2031	300,000	450,000	1,000,000	600,000	
2032	300,000	450,000	1,250,000	600,000	
2033	300,000	450,000	1,250,000	600,000	
2034	300,000	450,000	1,250,000	600,000	Year 20

**Table D-3. Final visitor projections.**

<i>Alternative</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	
2013	300,000	300,000	300,000	300,000	
2014	307,500	312,500	315,000	310,000	
2015	315,000	350,000	405,000	332,500	Implement
2016	322,500	362,500	444,400	339,470	
2017	330,000	375,000	484,952	371,726	
2018	337,500	387,500	501,748	404,279	
2019	345,000	425,000	519,888	412,142	
2020	352,500	437,500	539,479	420,327	
2021	360,000	450,000	660,637	428,848	
2022	367,500	462,500	683,488	437,718	
2023	375,000	475,000	708,167	446,952	

**Table D-3. Final visitor projections.**

2024	382,500	487,500	734,821	494,065	
2025	390,000	500,000	813,606	504,072	
2026	397,500	537,500	844,695	539,489	
2027	405,000	550,000	878,271	575,333	
2028	412,500	562,500	989,532	586,621	
2029	420,000	575,000	1,028,695	598,373	Year 15
2030	427,500	587,500	1,070,990	610,606	
2031	435,000	600,000	1,116,670	623,341	
2032	442,500	612,500	1,291,003	636,598	
2033	450,000	625,000	1,344,284	650,398	
2034	457,500	637,500	1,401,826	664,765	Year 20



# Appendix E

## *Standards of Excellence for Urban National Wildlife Refuges*

### E.1 Introduction

Conserving the Future: Wildlife Refuges and the Next Generation sets out an ambitious plan to enhance the relevance of the National Wildlife Refuge System (System) and the U.S. Fish and Wildlife Service (Service) to a rapidly changing America. In particular, it recognizes the importance of building a connected conservation constituency to the future of the System and to conserving natural resources. To build a representative and nationwide constituency, it also recognizes the pressing need to connect with ever growing populations in urban areas. To this end, the Conserving the Future document contains a specific recommendation:

“RECOMMENDATION 13: Create an urban refuge initiative that defines excellence in our existing urban refuges, establishes the framework for creating new urban refuge partnerships and implements a refuge presence in 10 demographically and geographically varied cities across America by 2015.”

The overall goal of the Urban Wildlife Conservation Program is to actively engage urban communities in wildlife conservation in partnership with the Service. The Urban Standards of Excellence serve as a framework for our success in the Urban Program.

The Urban Standards were developed in the past 3 years by the Urban Wildlife Refuge Team, with involvement from Service staff, partners, and the public through discussions during an Urban Academy at the National Conservation Training Center (in West Virginia), a public comment period, and a Directorate review. Each of the standards includes big picture questions, payoffs, and guideposts to check progress along the way. Evaluation tools and best practices are currently in development at several urban wildlife refuges.

The Urban Standards will help us determine if we are achieving our objectives, help us prioritize our work with urban audiences, and give us a way to measure progress in building a connected conservation constituency. The complete standards can be found at [www.fws.gov/urban](http://www.fws.gov/urban).

In brief, the Urban Standards of Excellence are:

1. **Know and Relate to the Community:** Understand the values, interests, cultures, and needs of the surrounding/adjacent community.
2. **Connect Urban People with Nature via Stepping Stones of Engagement:** Engage all demographic groups, providing varied opportunities to connect with and care for nature.
3. **Build Partnerships:** Utilize diverse partnerships within the community to achieve common goals for land stewardship and conservation of natural resources for the benefit of the community.
4. **Be a Community Asset:** Contribute resources toward improving the quality of community life, thereby strengthening the urban community as a whole.
5. **Ensure Adequate Long-Term Resources:** Have sufficient funding and appropriate staffing to attain and maintain excellence.
6. **Provide Equitable Access:** Accessible to all people living and working in nearby communities.
7. **Ensure Visitors Feel Safe and Welcome:** Maintain a high standard of facility maintenance, minimize real threats to safety and welcome and engage individuals from all demographic groups.
8. **Model Sustainability:** Adopt and showcase sustainable practices, proclaim the benefits of connecting with the natural world, and inspire sustainable actions for the benefit of wildlife and people.

The approach to excellence for urban national wildlife refuges must be as flexible and unique as the communities the refuges serve. The Service must strive to understand both human environments and natural environments in order to understand the expectations of the urban community. The Service

must strive to provide programs and leadership on conservation initiatives and projects that are relevant to the community as they conserve wildlife and habitats. Service staff, volunteers, and partners must engage urban communities and make meaningful connections to wildlife, especially in communities where opportunities to learn about and enjoy nature and wildlife are limited. This may start by building awareness, then fostering deeper understanding, followed by growing participation through programs that bring more people from the urban world into the larger conservation community.

Urban refuges are great places to build a broader conservation constituency, but the challenge is far too big for any one agency or organization to tackle alone. The Urban Wildlife Refuge Initiative 2 recognizes the importance of embracing traditional and new partnerships and collaborations. A variety of entities whose interests may be conservation, education, human health, or other subjects ultimately can help achieve conservation of wildlife, plants, and their habitats that are essential to maintaining a healthy planet for people.

## E.2 Using The Standards

- The term “urban refuge” is used throughout these standards. However, readers should be mindful that these standards apply not only to Service lands in urban areas, but also, to

the greatest extent possible, to all urban projects where the Service is a partner.

- Each urban refuge or partnership is unique. As such, a range of strategies and evaluation tools are provided to choose from.
- The objectives for each standard set Service expectations for urban refuges to plan for the future, to measure success, and to take advantage of the extraordinary opportunities to build a conservation constituency with the urban public.
- These standards are designed to complement other Conserving the Future recommendations and step-down plans. Visit [www.americaswildlife.org](http://www.americaswildlife.org) to reference other plans, particularly the Friends Mentoring Action Plan; Strategic Plan for Volunteers, Friends Organizations, and Community Partners; Environmental Education Strategic Plan; Interpretation Strategic Plan; and Strategic Communications Plan.
- To keep the Standards of Excellence current and relevant, they will be reviewed and updated by the Refuge System at a minimum of every 5 years.

To view the entire document entitled “Draft Urban Standards of Excellence,” please visit <http://www.fws.gov/urban/soe.php>.

# Appendix F

## Section 7 Biological Opinion— Black-Footed Ferret Reintroduction



### United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Ecological Services  
Colorado Field Office  
P.O. Box 25486, DFC (65412)  
Denver, Colorado 80225-0486

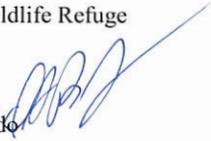


IN REPLY REFER TO:  
TAILS: 06E24000-2014-F-0855

APR 21 2015

#### Memorandum

To: David Lucas, Project Leader, Rocky Mountain Arsenal National Wildlife Refuge (Refuge or RMA NWR), Commerce City, Colorado

From: Charles A. Pelizza, Acting Field Supervisor, Colorado Field Office, U.S. Fish and Wildlife Service (Service), Region 6, Denver, Colorado 

Subject: Intra-Service Section 7 Consultation on the Reintroduction of Black-footed Ferrets to the Refuge (Project) in Commerce City, Colorado

Thank you for your request for formal consultation with the Service's Colorado Field Office (CFO) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (ESA). Your final intra-service Biological Assessment (BA) dated January 12, 2015, was received by us on the same date. The BA described impacts that may result from the proposed reintroduction of black-footed ferrets to the Refuge in Adams and Denver counties, Colorado, pursuant to the Regional Director's section 10(a)(1)(A) recovery permit. The proposed action may affect the black-footed ferret (*Mustela nigripes*; hereafter, ferret or BFF) and we concur with that determination.

In your BA, you also determined that the proposed action will have "no effect" on the following listed species: Mexican spotted owl (*Strix occidentalis lucida*), Ute ladies'-tresses orchid (*Spiranthes diluvialis*), the Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*), and Preble's meadow jumping mouse (*Zapus hudsonius preblei*). We agree with your determinations on those species. An earlier biological opinion (BO# ES/LK- 6-CO-13-F-020, TAILS: 06E24000-2013-F-0612) covered the potential effects of water use at the Refuge on federally listed species and designated critical habitat associated with the Platte River in Nebraska.

This biological opinion is based on information provided in the January 12, 2015, intra-service BA from the Refuge, the March 16, 2015, Black-Footed Ferret Allocation Request for the Rocky Mountain Arsenal National Wildlife Refuge, final rules/field work undertaken to reintroduce ferrets at other sites throughout the ferret's range, and other sources of information. Literature cited in this biological opinion is not a complete bibliography of all literature available on the species of concern, reintroduction actions and their effects, or on

other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office and the Refuge.

### **Consultation Background / History**

- |                       |  |
|-----------------------|--|
| 2010                  | The Refuge mapped current prairie dog acreage and determined that sufficient black-tailed prairie dog habitat exists to accommodate a ferret reintroduction for year-round occupation by ferrets.  |
| February 25, 2013     | Service CFO and Refuge Planning staffs met for an initial discussion of the upcoming planning process for the Refuge's Comprehensive Conservation Plan (CCP).  |
| April 24, 2013        | Conference call between the Service's Refuge Planning, CFO, and National Black-footed Ferret Conservation Center (BFF Conservation Center) staffs was held for a preliminary discussion of ferret reintroduction and the CCP planning process for the Refuge.                        |
| May 1, 2013           | The Refuge conducted a public meeting to review various "step down" management plans including its Black-tailed Prairie Dog Management Plan and Habitat Management Plan.   |
| May 6, 2013           | The Refuge conducted a Service pre-planning meeting [and tour] to discuss the RMA NWR and Two Ponds NWR CCP Work Plan, including a discussion about black-footed ferret reintroduction.  |
| June 26, 2013         | The Refuge held a "Kickoff" meeting for cooperating agencies participating in the development of the CCP, including the possible reintroduction of ferrets.  |
| July 2, 2013          | The Refuge issued its Black-tailed Prairie Dog Management Plan, which included a discussion of potential ferret reintroduction (Plan available online at: <a href="https://ecos.fws.gov/ServCat/Reference/Profile/29135">https://ecos.fws.gov/ServCat/Reference/Profile/29135</a> ). |
| July 25-Aug. 15, 2013 | The Refuge conducted public scoping meetings in Reunion, Commerce City, Stapleton, and Montbello/Green Valley Ranch to discuss the CCP development.  |
| August 19, 2013       | Denver International Airport (DIA) representatives, Service endangered species staff, and Refuge personnel met at the Refuge to discuss a potential release of ferrets on the Refuge.  |

September 6, 2013	The Refuge issued its Habitat Management Plan, which included a discussion of potential ferret reintroduction (Plan available online at: < <a href="https://ecos.fws.gov/ServCat/Reference/Profile/29133">https://ecos.fws.gov/ServCat/Reference/Profile/29133</a> >).
October 22, 2013	DIA, USDA, and Refuge staffs visited the BFF Conservation Center.
February 24-26, 2014	The Refuge conducted an Alternatives Development Workshop for biological programs, including species reintroductions, for the CCP.
April 30, 2014	The CFO received a preliminary first draft BA from Mike Dixon (for the Refuge).
April-May, 2014	The Refuge prairie dog management zones were dusted with deltamethrin.
May 8, 2014	Conference call between the CFO, Refuge, and BFF Conservation Center staffs was held to discuss the preliminary draft BA.
May 16, 2014	A preferred alternative, which included ferret reintroduction, was selected and refined for the CCP.
May 27, 2014	The CFO received the May 27, 2014, draft BA from the Refuge.
June 11, 2014	Conference call between the CFO, Refuge, and BFF Conservation Center staffs was held to discuss the May 27, 2014, draft BA.
July 26, 2014	The CFO received the July 25, 2014, draft BA from the Refuge.
July-August, 2014	Black-tailed prairie dog management zones were inventoried to determine prairie dog densities and overall BFF habitat conditions. (Report available online at: < <a href="https://ecos.fws.gov/ServCat/Reference/Profile/42958">https://ecos.fws.gov/ServCat/Reference/Profile/42958</a> >).
August 25, 2014	The CFO, Refuge, and BFF Conservation Center staffs met to discuss the July 25, 2014, draft BA.
December 1, 2014	Internal review of the draft CCP began with the planning team.
December 30, 2014	Conference call between the CFO and Refuge staffs was held to discuss the consultation process and schedule, BA, and BO.
January 7, 2015	Conference call between the CFO and Refuge staffs was held to discuss the October 28, 2014, draft BA.

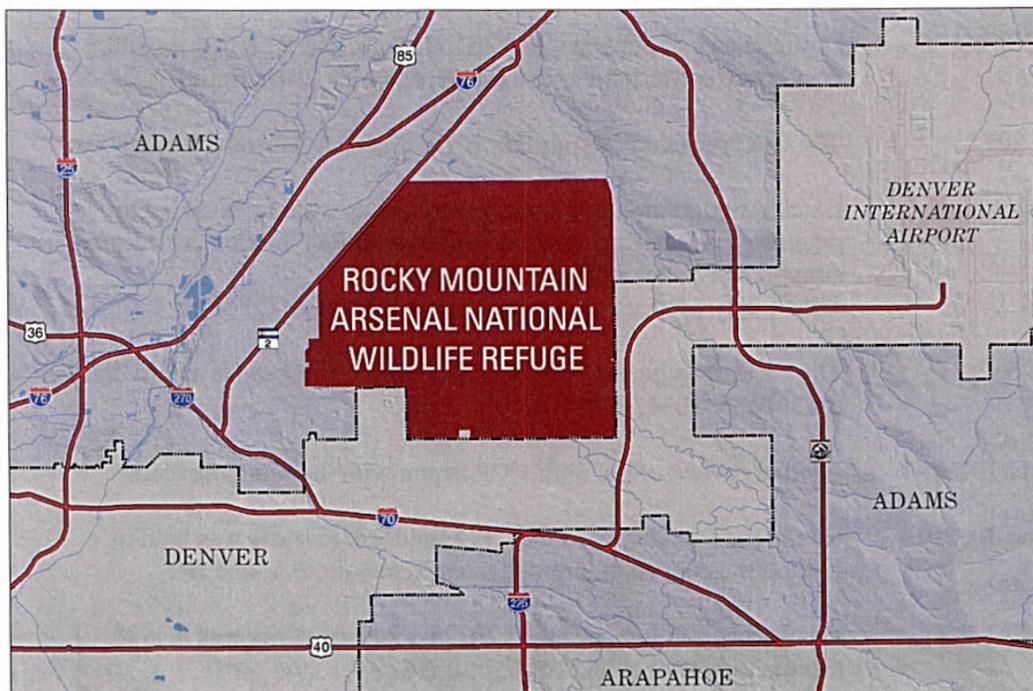
January 12, 2015	The CFO received the final, revised BA from the Refuge.
March 16, 2015	The Refuge submitted its 2015 Black-footed Ferret Allocation Request to the Black-footed Ferret Recovery Coordinator (cc: CFO) to become a ferret reintroduction site.
April 2015	A draft CCP/EIS was issued for public review/comment.

## BIOLOGICAL OPINION

### DESCRIPTION OF THE PROPOSED ACTION

The proposed action is the Service's reintroduction of black-footed ferrets at the Refuge; this would occur pursuant to the Regional Director's 10(a)(1)(A) recovery permit and would not designate critical habitat. The 15,998-acre Refuge is located immediately adjacent to the cities of Denver (south and east) and Commerce City (north and west) in Adams and Denver counties (Figure 1, from the January 12, 2015, BA). The reintroduction would occur within the current prairie dog management zones located on the Refuge and entirely within the jurisdictional boundaries of Refuge.

Figure 1. Rocky Mountain Arsenal NWR and vicinity.



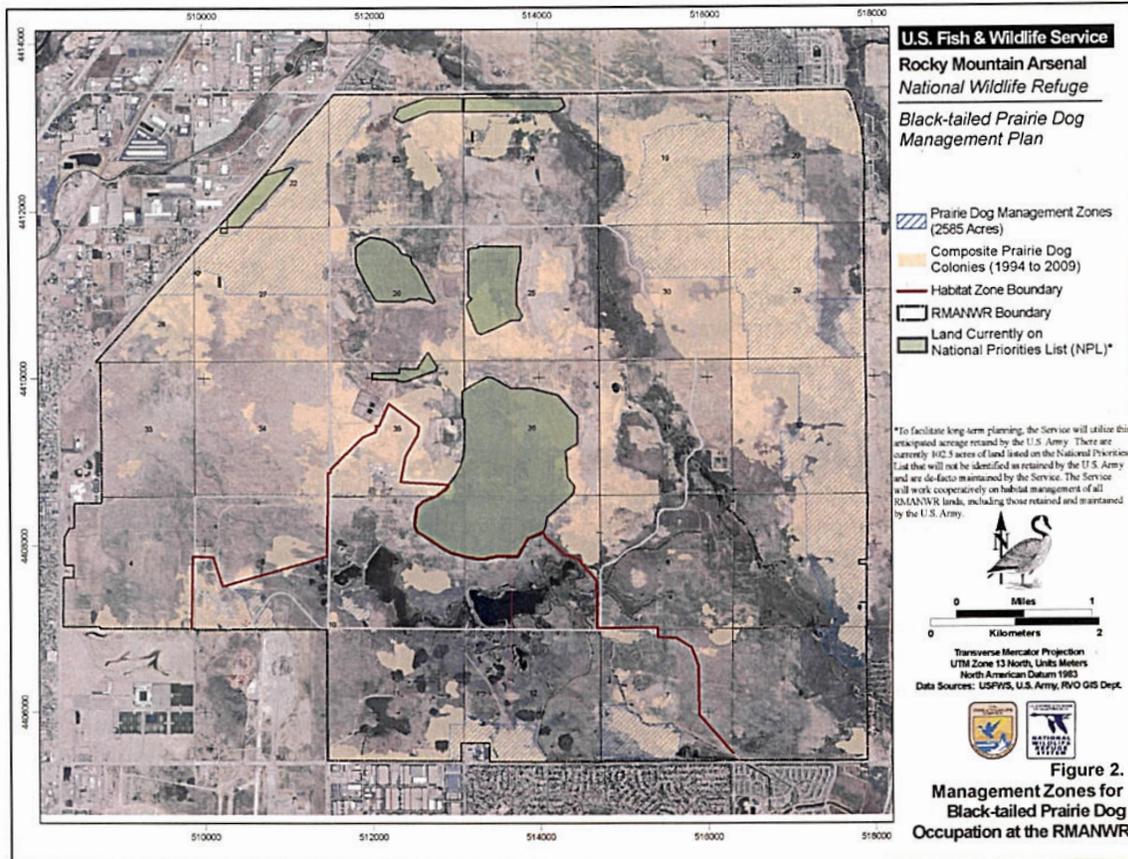
The Service is analyzing the impact of reintroducing black-footed ferrets to prairie dog colonies on the Refuge. As the lead agency for black-footed ferret recovery, the Service has an obligation to reintroduce the ferret to suitable habitats under its management, and ferret recovery has been a priority of the Service's Mountain Prairie Region since fiscal year 2014 (U.S. Fish and Wildlife Service 2013b).

The Refuge is located at the edge of the High Plains Ecoregion and has flat to gently rolling topography. The Refuge was formerly a Department of Defense facility, and a legacy of this was large-scale contamination of the site and its groundwater. While the majority of the resulting remediation is complete, the Refuge is now actively restoring habitat that was disturbed or destroyed during the remedial actions. The Refuge recently completed a habitat management plan (U.S. Fish and Wildlife Service 2013c) which is guiding this restoration. Historically, most of the Refuge was short- or mixed-grass prairie, and most of the 12,361 acres in the Prairie Zone described in the Habitat Management Plan will be restored to those vegetation types.

Both the Habitat Management Plan and the Black-tailed Prairie Dog Management Plan (U.S. Fish and Wildlife Service 2013d) were drafted specifically with an eye to managing vegetation and prey in a way that is consistent with potential reintroduction of black-footed ferrets. For the next several years, management of the Refuge under these plans will focus on taking the necessary steps to restore native grassland habitat, including the control of prairie dogs outside of defined prairie dog management zones (Figure 2, from the January 12, 2015, BA) because their foraging and other activities could adversely impact restoration efforts. Therefore, while the Refuge encompasses 15,998 acres, the initial reintroduction would be focused on studying the viability of ferret reintroduction on the six prairie dog management zones described in the habitat management plan, which total 2,585 acres. Existing prairie dog colonies at the Refuge are free of sylvatic plague, and the Refuge is currently annually dusting the six prairie dog management zones to control the fleas which are a vector for that disease. Plague management is intended to continue into the future.

The Refuge is surrounded on most of three sides by urban and suburban development, but there is some limited suitable ferret habitat adjacent to the Refuge. These include small prairie dog colonies on around the Commerce City's 190-acre Prairie Gateway Open Space in the southwest corner of the Refuge. There are also colonies to the north and northeast of the Refuge in the Reunion area of Commerce City extending toward Barr Lake State Park; however, this is a rapidly urbanizing area that will not likely maintain habitat contiguous with the RMA NWR for very long. There are larger colonies on the property of DIA east of the Refuge. However, much of the prairie dog habitat on DIA lands is separated from the Refuge by the heavily trafficked Pena Boulevard and E-470 highways. Ferrets that leave the Refuge are expected to be lost to the population, and success or failure of the Refuge ferret reintroduction would rely solely upon prairie dog acreage within the Refuge.

Figure 2. Management Zones for Black-tailed Prairie Dog Occupation at the RMA NWR.



As a part of the Superfund cleanup program, the Refuge was transferred to the Service for management. Section 2(a)(2) of the Rocky Mountain Arsenal National Wildlife Refuge Act of 1992 (Public Law 102-402) is clear that if there is ever a conflict between management of the Refuge and a response action (as defined by CERCLA), the response action “shall take priority”. Cleanup of the site was officially completed in 2010, but the U.S. Army and its contractors will maintain a long-term legacy management responsibility at the Refuge.

Provided habitat conditions remain stable, and captive ferrets are available for this project, a goal of 30 ferrets (at a 60:40 male to female ratio) would be released during the first year, but that allocation could be divided between different periods throughout the year. Subsequent ferret releases would be based on requirements outlined in the Refuge’s annual ferret allocation request submitted to the BFF Conservation Center. Ferrets to be released may come from existing ferret populations or from animals held and bred in captivity. Captive animals selected for release would be as genetically redundant as possible with the captive

population. All released animals would be marked with passive integrated transponder chips (chipped) and some may be fitted with radio transmitters. Both captive-raised and wild-born translocated ferrets (trapped from other authorized ferret reintroduction areas) would be released directly into targeted prairie dog complexes at about 18 weeks of age or older. Releases are likely to occur in the fall when juvenile black-footed ferrets in the wild typically become independent, exhibit dispersal behaviors and are more capable of killing their own prey, avoiding predators, and adjusting to environmental conditions. There may also be opportunities to try other release periods such as in the spring when other ferret reintroduction sites such as Arizona have shown some successes.

Release techniques would be patterned after successful procedures used at other reintroduction sites. All captive raised ferrets would be adequately “preconditioned” prior to release in the wild. Preconditioning is the process by which ferrets are allowed to live in large outdoor pens which have prairie dog burrow systems. Captive ferrets are either born in pens or are transferred to pens between 60 and 90 days of age. Ferrets exposed to “natural” burrow systems and live prey survive in the wild at significantly higher rates than do ferrets released directly from indoor cages.

A hard release with translocated wild born ferrets would occur if removal of wild born ferrets at other existing experimental reintroduction sites is determined compatible with overall ferret management goals. In such cases, wild born ferrets captured from other reintroduction sites would be transported directly to release sites on the Refuge and released immediately.

Regardless of release technique, ferrets would be placed in separate burrow systems within contiguous prairie dog colonies. Because all animals may not reach the proper age for release at once, black-footed ferrets could likely be released sequentially over a period of 3-8 weeks or longer. Translocated wild ferrets would have minimal holding periods between capture and release. Most releases would occur in September and October, when young ferrets are about 18 weeks old. Releases may also occur later in the fall or other periods throughout the year as deemed appropriate by the Black-footed Ferret Recovery Coordinator and depending upon dates that wild ferrets may become available.

Because mortality of released animals can be high, multiple releases over successive years may likely be necessary to establish a population. In the future, some ferrets may be radio-collared to determine dispersal and short term survival, but this is not expected to be a primary means of monitoring. Spotlight and/or snow track monitoring may begin as soon as ferrets are released and would continue for several years, at predetermined survey periods, typically late summer or fall.

The Refuge and its partners would continue to seek advice and test alternative release and management strategies and may make adjustments in the ferret reintroduction as warranted. In subsequent years, alternative reintroduction techniques could be tested as deemed necessary by the Refuge and its partners.

Reintroduced ferrets may be relocated by the Refuge if necessary to: 1) avoid conflict with human activities; 2) with adjacent landowner permission, relocate a ferret that has moved outside the reintroduction area and removal is deemed necessary to protect the ferret or is requested by the affected landowner; 3) improve ferret survival and recovery prospects, 4) if the habitat is filled and surplus ferrets are needed at other sites, or 5) if the reintroduction is deemed unsuccessful, remaining ferrets may be captured and moved to other suitable reintroduction sites in other states as directed by the Service. Ferret reintroduction efforts would be reevaluated should any of the following conditions occur:

- Failure to maintain sufficient habitat to support at least 30 breeding adults after five years.
- Failure to maintain suitable prairie dog habitat.
- An active case of sylvatic plague is discovered in any animal on or near the reintroduction area within six months of the scheduled release.
- Funding is not available to implement reintroduction efforts on the Refuge.

Predator management actions may be taken to reduce predation on ferrets by coyotes, badgers, and great horned owls immediately prior to release but none are planned. If necessary, other predator control efforts may be initiated if excessive predation rates are documented.

Disease surveillance would be conducted annually (beginning within 12 months of the scheduled release, and for up to 5 years post-release) by the Refuge or its partners from within the area to monitor canine distemper, tularemia and plague occurrence. Released ferrets and captured wild born ferrets would be inoculated against canine distemper and plague.

The proposed action would not affect control of prairie dogs on non-federal lands outside the Refuge. Further, the Refuge has an existing prairie dog management plan, which allows for prairie dog control on Refuge lands to address encroachment issues. If deemed necessary by the Refuge, prairie dog control would be done only by authorized personnel and in accordance with the approved Refuge Black-Tailed Prairie Dog Management Plan. Prairie dog management is necessary to ensure the success of efforts to restore native vegetation following remediation activities on the Refuge, as well as to maintain the integrity of landfills under Army jurisdiction in areas that are still part of the National Priorities List (U.S. Fish and Wildlife Service 2013b). It is not necessary to restrict prairie dog management activities on other colonies outside of the Prairie Dog Zones (Figure 2) on or off the Refuge because this ferret reintroduction is to determine whether ferrets can be established on colonies within the Refuge. Continued implementation of the existing Prairie Dog Management Plan is also compatible with ferret reintroductions because the Refuge has the mechanism in place to determine where control may occur and move ferrets as might be necessary to avoid conflicts.

Environmental cleanup of the Refuge was completed in 2010 and no additional response actions are envisioned on Refuge lands. However, if deemed necessary, a response action requiring soil excavation or removal is possible anywhere on the Refuge. This is considered an unlikely scenario. However, the Service would be involved in all projects occurring on Refuge lands and would take necessary steps to reduce take of ferrets.

As part of the proposed action, the Refuge would implement the following conservation measures to reduce impacts to black-footed ferrets:

- Ferret populations and overall survival would be monitored at least once each year in coordination with the BFF Conservation Center staff. All data, information and lessons learned would be shared with the greater biology community to improve ferret recovery.
- Plague management (e.g., dusting with deltamethrin, vaccine, etc.) and surveillance would be conducted on an annual, or as needed basis, to reduce potential impact to prairie dog colonies.
- Recurring monitoring of prairie dog colonies would occur to obtain information regarding population densities and areas of occupancy.
- Management of black-tailed prairie dog colonies through the use of prairie dog management zones; this would help the Refuge meet population goals for prairie dogs and ferrets, while also meeting habitat restoration goals.
- Predator management would occur through the removal of unnatural vertical structures that could provide perches for raptors.
- Education would be provided through media releases, displays at the Refuge, and other future opportunities.
- Formal (e.g., Memorandum of Agreements) and informal partnerships would be fostered with neighbors and conservation organizations to promote the awareness of black-footed ferrets at the Refuge and nationwide.

#### **STATUS OF THE SPECIES / ENVIRONMENTAL BASELINE**

The black-footed ferret is a medium-sized member of the Mustelidae family typically weighing 1.4–2.5 pounds and measuring 19–24 inches in total length. Upper body parts are yellowish buff, occasionally whitish; feet and tail tip are black; and a black “mask” occurs across the eyes. It is the only ferret species native to the Americas. There are no recognized subspecies. Other ferret species in the genus include the Siberian polecat (*M. eversmanni*) and the European ferret (*M. putorius*) (Hillman and Clark 1980; Anderson et al. 1986). The black-footed ferret was first formally described in 1851 by J.J. Audubon and J. Bachman (Clark et al. 1986). The species entered North America from Siberia approximately 1–2 million years ago, spread across Beringia, and advanced southward through ice-free corridors to the Great Plains approximately 800,000 years ago (Wisely 2006). Contrary to early characterizations that addressed natural history, it was probably common historically, although its secretive habits (nocturnal and often underground) made it difficult to observe (Forrest et al. 1985; Anderson et al. 1986; Clark 1989).

Black-footed ferrets prey primarily on prairie dogs and use their burrows for shelter and denning (Henderson et al. 1969; Hillman and Linder 1973; Forrest et al. 1985). Black-footed ferrets depend almost exclusively on prairie dogs for food and shelter, and the species' range overlaps three prairie dog species (Anderson et al. 1986). With no documentation of black-footed ferret breeding outside of prairie dog colonies, the Service believes that black-footed ferrets were historically endemic to the range of three prairie dog species. There are records of black-footed ferrets from the ranges of the black-tailed prairie dog, white-tailed prairie dog, and Gunnison's prairie dog (Anderson et al. 1986) which collectively occupied approximately 100 million acres (ac) of intermontane and prairie grasslands (Biggins et al. 1997; Clark et al. 1986; Ernst et al. 2006). The historical range of the species includes 12 States (Arizona, Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah, and Wyoming) and the Canadian provinces of Alberta and Saskatchewan (Anderson et al. 1986); this range is also the action area for the proposed action. Ernst (2008 pers. comm.) estimated that in the United States, this occupied habitat existed within an estimated 562 million ac of potential habitat. Ernst (2008 pers. comm.) used a geographic information system (GIS) database to predict the distribution of prairie dog habitat across the United States and concluded that historically 85 percent of all black-footed ferrets probably occurred in black-tailed prairie dog habitat, 8 percent in Gunnison's prairie dog habitat, and 7 percent in white-tailed prairie dog habitat. The Service concludes that most black-footed ferrets likely occurred in black-tailed prairie dog habitat.

The black-footed ferret breeds at approximately one year of age, from mid-March through early April, and gestation is about 42-45 days. Litter sizes average about 3.5 (Wilson and Ruff 1999). Juveniles disperse in late summer/early fall. The black-footed ferret leads a solitary existence except for mating and the period when mother and young are together (Forrest et al. 1985). It is a "searcher" predator that is generally nocturnal, appearing above ground at irregular intervals and for irregular durations (Clark et al. 1986).

The black-footed ferret's close association with prairie dogs was an important factor in its decline. From the late 1800's to approximately 1960, both prairie dog habitat and numbers were dramatically reduced by the combined effects of habitat loss from conversion of native prairie to cropland, poisoning of prairie dogs, and disease, particularly sylvatic plague (U.S. Fish and Wildlife Service 2008). Sylvatic plague, caused by a non-native bacterium, can be devastating to both prairie dogs and black-footed ferrets. By 2005, plague had been detected in prairie dogs in all 12 states throughout the historical range of the black-footed ferret (Abbott and Rocke 2012).

The black-footed ferret was considered extinct or nearly extinct when a small population was located in Mellette County, South Dakota, in 1964 (Henderson et al. 1969). The species was listed as endangered under early endangered species legislation by the Service in 1967 and was "grandfathered" into the ESA in 1973 (U.S. Fish and Wildlife Service 2008). No critical habitat has been proposed or designated for this species. The last wild black-footed ferret observed at the Mellette County site was in 1974 (Clark 1989). Attempts at captive breeding of a few captured animals from the Mellette County population failed, and when the last

captive animal died at Patuxent Wildlife Research Center in Laurel, Maryland, in 1979, the species was again presumed extinct (U.S. Fish and Wildlife Service 1988).

In 1981, a second remnant population was discovered in Meeteetse, Wyoming (Clark et al. 1986; Lockhart et al. 2006). Following disease outbreaks at Meeteetse, all surviving wild black-footed ferrets (totaling 18 individuals) were removed from the wild between 1985 and 1987 to initiate a captive breeding program (U.S. Fish and Wildlife Service 1988). Seven of the black-footed ferrets captured at Meeteetse successfully reared young, leading to a lineage of continuing captive reproduction that provides black-footed ferrets to reintroduction sites today (Hutchins et al. 1996; Garelle et al. 2006). Reintroductions began in 1991 (Table 1, U.S. Fish and Wildlife Service 2013a; updated by John Hughes, Wildlife Biologist, Black-footed Ferret Recovery Program), and all extant populations, both captive and reintroduced, descend from these seven “founder” animals (Garelle et al. 2006).

Table 1. Black-footed ferret reintroduction sites, year initiated, and prairie dog species.

SITE (YEAR INITIATED)	PRAIRIE DOG SPECIES
Shirley Basin, Wyoming (1991)	White-tailed
UL Bend National Wildlife Refuge, Montana (1994)	Black-tailed
Badlands National Park, South Dakota (1994)	Black-tailed
Aubrey Valley, Arizona (1996)	Gunnison’s
Conata Basin, South Dakota (1996)	Black-tailed
Fort Belknap Indian Reservation, Montana (1997)	Black-tailed
Coyote Basin, Colorado and Utah (1999)	White-tailed
Cheyenne River Indian Reservation, South Dakota (2000)	Black-tailed
Bureau of Land Management 40-Complex, Montana (2001)	Black-tailed
Wolf Creek, Colorado (2001)	White-tailed
Janos, Mexico (2001)	Black-tailed
Rosebud Indian Reservation, South Dakota (2004)	Black-tailed
Lower Brule Indian Reservation, South Dakota (2006)	Black-tailed
Wind Cave National Park, South Dakota (2007)	Black-tailed

Espee Ranch, Arizona (2007)	Gunnison's
Logan County, Kansas (2007)	Black-tailed
Northern Cheyenne Indian Reservation, Montana (2008)	Black-tailed
Vermejo Park Ranch, New Mexico (2008)	Black-tailed
Grasslands National Park, Saskatchewan (2009)	Black-tailed
Vermejo Park Ranch, New Mexico (2012)	Gunnison's
Walker Ranch, Colorado (2013)	Black-tailed
City of Fort Collins, Colorado (2014)	Black-tailed
North Holly, Colorado (2014)	Black-tailed
Liberty, Colorado (2014)	Black-tailed

No wild populations of black-footed ferrets have been found since the capture of the last Meeteetse black-footed ferrets, despite extensive and intensive range-wide searches. It is unlikely that any undiscovered wild populations remain (Lockhart et al. 2006). No known extant wild populations of black-footed ferrets exist, except those at reintroduction sites.

Approximately 280 animals currently make up the current black-footed ferret captive population at six facilities which provide surplus animals for release. To date, in addition to those in the 6 captive breeding facilities, approximately 274–448 black-footed ferrets exist at 24 reintroduction sites across their historical range (Table 1). Captive breeding and the release of surplus black-footed ferrets continue in efforts to establish more populations throughout their range.

Section 10(j) of the ESA allows reintroduced populations to be designated Nonessential Experimental Populations (NEP) to ease concerns about reintroductions of threatened and endangered species and to facilitate species recovery efforts. To date, 11 black-footed ferret reintroductions have occurred through use of Section 10(j) designated NEP areas in the United States (U.S. Fish and Wildlife Service 2008). There have also been seven reintroductions in the United States that used Section 10(a)(1)(A) recovery permits, which included both site-specific permits and the Black-footed Ferret Programmatic Safe Harbor Agreement. Additionally, there have been reintroductions in Chihuahua, Mexico, and in Saskatchewan, Canada, in compliance with those countries' statutes, for a total of 20 reintroduction attempts (U.S. Fish and Wildlife Service 2008; Fargey 2010). See Table 1 for the location and date of initiation of each of the black-footed ferret reintroduction sites.

At the present time, black-footed ferret populations at active reintroduction sites persist only through the purposeful management of prairie dogs to protect both black-footed ferrets and prairie dogs from sylvatic plague. Without such management, it is likely that any extant black-footed ferret populations would be reduced to zero due to this recurring non-native disease. Therefore, baseline for the black-footed ferret under the proposed action is considered to be zero because no ferrets would occur on the Refuge until reintroduction of the species. Further, we do not expect that black-footed ferrets would persist long-term on most properties without purposeful management of prairie dogs to protect both black-footed ferrets and prairie dogs from sylvatic plague.

The Refuge is within the range of the black-tailed prairie dog, and ferrets are believed to have occurred throughout this prairie dog species' range (U.S. Fish and Wildlife Service 1988). Ferrets do not currently occur in the action area. The closest location of reintroduced ferrets is at the Soapstone Prairie Natural Area in Larimer County, Colorado, approximately 80 miles north of the Refuge. Although sylvatic plague has been documented in many parts of Colorado and in black-tailed prairie dogs on the Refuge during the 1990s, there has not been an occurrence of plague at the Refuge since 2002. As noted above, the Refuge prairie dog management zones were treated for sylvatic plague in 2014 by dusting with deltamethrin, and they will be dusted again in 2015.

#### **EFFECTS OF THE ACTION**

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action, which will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

Under the proposed action, black-footed ferret reintroductions would be carried out on the Refuge as described above. During ferret reintroductions and monitoring, some mortality may result from transporting and handling of ferrets. While occasional ferret deaths due to handling have occurred at some ferret release sites, the use of the handling protocol outlined in Roelle et al. (2006) would minimize losses. To date, less than 0.5 percent of the more than 2,700 ferrets reintroduced have perished from transporting and handling (Gober pers. comm., 2012). Incidental take of reintroduced black-footed ferrets could occur through vehicle or equipment collisions. While such rare incidents have been documented, the likelihood of vehicle collisions is low due to the nocturnal habits of the ferrets.

Black-footed ferret survival rates 30 days after release range from 10.1 percent, for early reintroduction efforts, to 45.5 percent, for more recent reintroduction efforts that pre-conditioned ferrets prior to their release (Biggins et al. 2005). Relatively low survival rates among reintroduced ferrets are principally due to predation and other natural causes. Captive-

raised ferrets have not been exposed to the same environmental factors and therefore have not developed the same resiliency as wild ferrets. Furthermore, captive-raised ferrets may not have had sufficient experience in hunting prey or avoiding predators. According to studies at Meeteetse, Wyoming, in the 1980s, natural mortality of ferrets in the wild is high. Data presented by Forrest et al. (1988) was used for computer simulation modeling that indicated juvenile mortality rate of a stable wild population up to approximately 78.5 percent. Juvenile mortality of captive-raised ferrets is likely to be higher for the reasons stated above. However, despite the low survival rates for reintroduced ferrets, it only takes a few ferrets to establish a wild population as documented at successful ferret reintroduction sites.

The Refuge is located within an urban environment, with developed or developing residential and commercial activities to the north, west, and south, and airport operations, transit, parks, infrastructure, and commercial activities on DIA property to the east. Released ferrets and their offspring would be subject to mortality from natural factors and unintentional mortality. Ferrets which disperse off of the Refuge may be subject to direct or indirect take due to a variety of reasons, including but not limited to loss of habitat due to development, fatalities caused by domestic animals, collisions with vehicles, and aeronautic, commercial, transit, and infrastructure activities at DIA. Further, animal control activities associated with airport operations, and transit, commercial, parks, and infrastructure development on DIA may cause direct or indirect take of ferrets on DIA property.

Specific management activities on the Refuge and adjacent areas that may possibly result in the unintentional mortality of reintroduced ferrets or their offspring include mortalities associated with:

- Habitat restoration activities such as disking, plowing, seeding, mowing, spraying, or irrigation (see U.S. Fish and Wildlife Service 2013c for a full description of habitat management implementation actions).
- Prescribed fire management.
- Prairie dog control (see U.S. Fish and Wildlife Service 2013d for a full description of prairie dog management implementation actions and the proposed action, above, for details on control efforts).
- Unintentionally killing or injuring ferrets: 1) by authorized agency personnel or agents conducting management actions such as trapping, handling and monitoring of ferrets; or 2) during trapping of other wildlife species (e.g., burrowing owls).
- Vehicular traffic.
- Regular refuge operations such as the maintenance and operation of facilities and infrastructure. These may include, but are not limited to: fences, buildings, roads, water control structures (these impacts on ferrets are expected to be rare).
- Recreational shooting and trapping; because these activities are not allowed on the Refuge, they are not likely to occur/become an issue.
- General public use allowed on the Refuge consisting of, but not limited to fishing, hunting (mourning dove and deer by shotgun and archery only), interpretation,

environmental education, and wildlife observation and photography; however, these activities are also not expected to be an issue.

- Monitoring of ferrets would occur on the Refuge and, if patterns of mortality are noted, the Service would determine appropriate measures that might reduce such losses.

Substantial benefits of the proposed action include: the establishment of another ferret population in Colorado; and further development of techniques and knowledge that might be attained from successfully reintroducing ferrets into the central part of the black-tailed prairie dog range. Further, if this effort is successful, it may help reduce the threat of extinction facing the ferret by establishing an additional population of ferrets in a portion of the ferret's historical range. While the long term effects of the ferret reintroduction are expected to be beneficial and contribute to the overall recovery of the species, for the reasons described above, there could be short and long-term adverse effects to individual ferrets from the reintroduction efforts.

#### **CUMULATIVE EFFECTS**

Cumulative effects include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

The Service anticipates that states, tribes, and private landowners would continue to implement conservation actions that benefit the black-footed ferret on a limited and site-specific basis. These efforts include plague management using deltamethrin, and prairie dog management using both lethal and non-lethal techniques. The Service also anticipates that sylvatic plague would continue to present a significant challenge to black-footed ferret recovery, as the disease is widespread throughout the range of the species. The extent of non-federal activities to manage plague is not well-known, but some efforts on tribal lands in Montana show promise and may serve as a model for future plague management efforts in other areas.

The use of anticoagulant rodenticides such as Rozol® and Kaput® by non-federal entities in the range of the black-footed ferret is likely to increase, although its use may be supplanting some of the previously-used rodenticides such as zinc phosphide. Because Rozol use at ferret reintroduction sites is not allowed for this project and through previous consultations (U.S. Fish and Wildlife Service 2012), current and future ferret reintroduction sites are not expected to be seriously impacted.

#### **CONCLUSION**

After reviewing the current status of the black-footed ferret, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the CFO's

biological opinion that the reintroduction of ferrets on the Refuge, as proposed, is not likely to jeopardize the continued existence of the ferret.

We base this conclusion on the following:

- Ferrets that would be used in this effort are not essential to the overall survival of the species.
- Precautionary measures would be implemented to reduce losses within the reintroduced population.
- The overall effect of the proposed action would be beneficial, by increasing knowledge about ferret conservation and potentially establishing a new self-sustaining population of ferrets.

The conclusions of this biological opinion are based on full implementation of the Project as described in the **DESCRIPTION OF THE PROPOSED ACTION** section of this document, including any conservation measures that were incorporated into the project design.

#### INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is further defined (50 CFR 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. “Harass” is defined (50 CFR 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. “Incidental take” is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement (ITS).

The conservation measures identified above in the **DESCRIPTION OF THE PROPOSED ACTION** section would be implemented to provide a net conservation benefit to and a contribution to the recovery of the black-footed ferret. Consequently, all of these conservation measures are hereby incorporated by reference as reasonable and prudent measures and terms and conditions within the ITS pursuant to 50 CFR §402.14(i). Such terms and conditions are non-discretionary and must be undertaken by the Refuge for the exemption under Section 7(o)(2) of the ESA to apply. If the Refuge fails to adhere to these terms and conditions, the protective coverage of Section 7(o)(2) may lapse. The amount or

extent of incidental take anticipated under the Project, associated monitoring and reporting requirements, and provisions for disposition of dead and injured animals are described below.

#### **AMOUNT OR EXTENT OF TAKE ANTICIPATED**

The CFO has reviewed management activities on the Refuge and we believe these activities are compatible with the objectives of the proposed ferret reintroduction, but that some incidental take could still occur. Based on information from other reintroduction sites, we anticipate that a low level of incidental take (injury or death) may occur on the Refuge due to natural causes and normal land management activities.

In addition to those activities identified above, reintroduced ferrets that move off of the Refuge may also be subjected to direct or indirect take from land uses and activities occurring off of the Refuge including, but not limited to, wildlife hazard mitigation and maintenance activities associated with airport operations and transit, commercial, parks, and infrastructure development on DIA; and similar development on other commercial and residential properties. Such anticipated take is an indirect effect of the proposed action, is included in this ITS, and therefore not a violation of the ESA. The incidental take level described herein covers accidental or unintentional take in the form of harm (injury or death) and harassment (disturbance) caused by otherwise legal activities within the Refuge and on lands outside of the Refuge. Ferret mortality due to natural predation is not considered take and does not count against the level of incidental take allotted to the Refuge. Incidental take that may occur on lands adjacent to the Refuge is covered by this ITS and, likewise, does not count against the level of incidental take allotted to the Refuge. We believe it is appropriate to cover all incidental take of ferrets that occur offsite through this ITS because we do not expect dispersing ferrets to return to the Refuge. Further, we expect most dispersing ferrets to perish if they move away from the habitat provided on the Refuge. We expect off-site ferret mortality will occur primarily from predation or plague, but if some mortality occurs from the otherwise lawful activities as described above, we are covering that mortality completely through this ITS. Accordingly, adjacent landowners are not required to obtain incidental take permits for otherwise legal activities that may unintentionally take ferrets that leave the Refuge.

We anticipate that all ferrets that move off the Refuge will be lost due to natural causes (e.g., predation or starvation) or incidental take. Based on the lack of habitat outside the Refuge, we expect most off-Refuge losses to be from natural causes. Ferret movement off of the Refuge is most likely to happen as the habitat within the Refuge becomes occupied by ferrets. In cooperation with DIA and the other adjacent landowners, the Refuge would attempt to trap these ferrets and relocate them to the Refuge or other suitable areas determined by the Services' Black-Footed Ferret Recovery Coordinator.

The following information was used to set a level of incidental take for the Refuge for the proposed action. Information contained in the effects section concerning natural mortality of ferrets introduced into the wild can be used to bracket the anticipated level of incidental take.

Human-caused mortality is expected to be greater than 1.7 percent, but should be less than 21.5 percent (100 percent minus the estimated natural mortality of 78.5 percent). With a range of 1.7 percent to 21.5 percent, the midpoint of this range is 11.6 percent.

Therefore, based on data from studies of ferrets in the wild at Meeteetse, Wyoming, data from other reintroduction sites, and population modeling (see administrative record), the CFO estimates the annual incidental take level from human-caused mortality could be up to 12 percent of the estimated fall-monitored ferret population in the Refuge. In the first year following black-footed ferret releases, incidental take will be measured against the total number of ferrets released. In subsequent years, incidental take will be measured against the total number of ferrets known or estimated to exist in the wild in the reintroduction area, i.e., ferrets that survived release from previous years, their offspring, and any additional released ferrets. Implementation of the terms and conditions below should reduce the injury and death below the 12 percent level.

The CFO anticipates that the following take of ferrets could occur as a result of the proposed action:

1. No more than 12% of the current year's estimated fall ferret population will be killed or wounded as a result of normal land-use practices and refuge activities within the Refuge. If observed injury or mortality of 12% of the estimated fall ferret population is reached (3 ferrets the first year based on the projected 30-ferret allocation), the CFO and Black-Footed Ferret Recovery Coordinator will evaluate whether reinitiation of consultation is appropriate.
2. All ferrets that leave the Refuge and are taken incidentally during the course of conducting otherwise legal activities are covered by this ITS. We anticipate this number will be very low given that 24 years of ferret reintroductions have produced very few ferret sightings outside of release areas and reported mortalities away from reintroduction sites are exceedingly rare.

#### **EFFECT OF THE TAKE**

In this biological opinion, the CFO determines that this level of anticipated take is not likely to result in jeopardy to the species. We believe prairie dog colonies off of the Refuge are not necessary to the success of the Refuge's ferret reintroduction efforts; therefore, management of prairie dogs or other activities on those adjacent lands that may result in incidental take of ferrets are not restricted by this action.

#### **REASONABLE AND PRUDENT MEASURES**

The CFO believes that the following Reasonable and Prudent Measures (1, 2, and 3) are necessary and appropriate to minimize or avoid the impacts of incidental take of black-footed ferrets resulting from the proposed action. These reasonable and prudent measures, and their

implementing terms and conditions (bulleted items) that also outline monitoring and reporting requirements, are non-discretionary:

1. The proposed action identifies the conservation measures that will be implemented to benefit the black-footed ferret. All of these conservation measures, which are described above, are hereby incorporated by reference as reasonable and prudent measures within the ITS.
2. The Refuge shall maximize the probability of success of ferret reintroduction by allowing for adaptive management, implementing up-to-date scientific procedures, providing public education, and coordinating with neighboring land users.
3. The Refuge shall ensure that the information to evaluate the success of the reintroduction is accomplished via appropriate monitoring and reporting measures.

#### **TERMS AND CONDITIONS**

In order to be exempt from the prohibitions of Section 9 of the ESA, the following terms and conditions, which implement the reasonable and prudent measures described above, must be followed.

##### **To Implement Reasonable and Prudent Measure 1:**

- The Refuge will work to fully implement the conservation measures described in the proposed action.

##### **To Implement Reasonable and Prudent Measure 2:**

- The Refuge shall implement the ferret reintroduction effort as described in the proposed action.
- The Refuge shall implement an information and education program that provides the public and agency personnel in the affected counties in Colorado with details of ferret recovery efforts.
- The Refuge shall seek cooperation in reporting the taking or occurrence of ferrets in or near the Refuge.
- The Refuge shall work with land users in the area to seek their cooperation in designing improved management strategies for attaining the goals and objectives of the Project.
- The Refuge shall attempt to capture and remove ferrets from non-refuge lands if necessary and/or requested.
- The Refuge shall add, as appropriate, emerging strategies and contingencies to the ferret reintroduction efforts to minimize unnecessary harm to ferrets.
- The Refuge shall add, as appropriate, strategies and contingencies to its reintroduction and management plans to minimize unnecessary harm to ferrets.

**To Implement Reasonable and Prudent Measure 3:**

- The Refuge shall provide a primary ferret program contact for agencies, private landowners, and the public users in the affected area; follow up reports of injured or killed ferrets; immediately notify the Field Supervisor, Colorado Field Office, Lakewood, Colorado, (303) 236-4774, and submit follow-up reports of injured or killed ferrets; and immediately notify the Service's Law Enforcement Office as described below in the "Disposition of Dead or Injured Listed Species" section.
- Pursuant to the Regional Director's 10(a)(1)(A) recovery permit, the Refuge shall annually monitor the ferret population and its habitat and document the potential of ongoing activities or circumstances which may present unanticipated hazards to ferrets.
- The Refuge shall record and manage information on ferret mortalities as described below.

**Review Requirement**

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. If, during the course of the action, the level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. The Refuge must immediately provide an explanation of the causes of the taking and review with the CFO the need for possible modification of the reasonable and prudent measures.

If the incidental take level of 12 percent of the entire ferret population (as determined by fall annual monitoring) attributable to the proposed action is reached in any year within the Refuge, the entire reintroduction project will be reevaluated in coordination with the CFO and Black-Footed Ferret Recovery Coordinator to determine whether better management measures are needed or could be undertaken to reduce ferret mortality from human factors and to determine if section 7 consultation should be reinitiated.

**Disposition of Dead or Injured Federally Listed Species**

Upon locating a dead, injured, or sick listed species, initial notification shall be made to the Service's Law Enforcement Office, 9297 S. Wadsworth Blvd., Littleton, Colorado 80128-5599 (Phone: 720 981-2777, Fax: 720 981-2727) within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office. Caution must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve the biological material in the best possible state.

The Black-Footed Ferret Recovery Coordinator should also be notified at U.S. Fish and Wildlife Service, P.O. Box 190, Wellington, CO 80549. Phone: 970-897-2730 x 224, Fax: 970-897-2943, Mobile: 720-626-5260.

### **CONSERVATION RECOMMENDATIONS**

Section 7(a)(1) of the ESA directs federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. We recommend the Refuge work with DIA to incorporate the use of rodenticides that present a lower risk of secondary poisoning than anticoagulants for prairie dog control efforts on DIA property.
2. We recommend the Refuge continue to refine contingencies to deal with a disease epizootic (plague, canine distemper, etc.) that may occur in the area and that might necessitate the rescue of the ferret population on the Refuge. Disease contingency strategies should be included in annual ferret allocation proposals submitted by the Refuge to the Black-footed Ferret Recovery Program and CFO.
3. We recommend the Refuge continue to participate on the Black-footed Ferret Recovery Implementation Team and Colorado Black-footed Ferret Working Group.

In order for the CFO to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the CFO requests notification of the implementation of any conservation recommendations. This can occur during annual Black-footed Ferret Recovery Implementation Team meetings or through other methods at the Refuge's discretion.

### **REINITIATION NOTICE**

This concludes formal consultation on the action outlined in the January 12, 2015, request from the Refuge. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any activities causing such take must cease pending reinitiation. Reinitiation is not required for ongoing population management activities that

support black-footed ferret recovery at the Refuge, including periodic population supplementation through the reintroduction of additional captive-reared and/or wild-born black-footed ferrets.

The CFO appreciates your efforts to recover ferrets pursuant to the Regional Director's 10(a)(1)(A) recovery permit to benefit this species. For further information, please contact Sandy Vana-Miller at (303) 236-4748. Please refer to the consultation number, TAILS: 06E24000-2014-F-0855, in future correspondence concerning this project.

cc: Regional Director, Fish and Wildlife Service, Denver, CO (ARD-ES) (Attn: Noreen Walsh)  
Assistant Regional Director, Refuges, Region 6 (Attn: Will Meeks)  
Assistant Regional Director, Ecological Services, Region 6 (Attn: Bridget Fahey, Branch Chief, Endangered Species)  
Black-footed Ferret Recovery Coordinator, Fish and Wildlife Service, Wellington, CO (Attn: Pete Gober)  
Wildlife Biologist, Black-footed Ferret Recovery Program (Attn: John Hughes)  
Supervisor, Species Conservation Program, Colorado Parks and Wildlife (Attn: Francie Pusateri)

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Annual bursage/flatspine bur ragweed	<i>Ambrosia acanthicarpa</i>
Common ragweed *	<i>Ambrosia artemisiifolia</i>
Western ragweed	<i>Ambrosia psilostachya</i>
Tomentose ragweed/skeletonleaf bur ragweed	<i>Ambrosia tomentosa</i>
Great ragweed/giant ragweed *	<i>Ambrosia trifida</i>
Pearly everlasting	<i>Anaphalis margaritacea</i>
Rosy pussytoes/pink pussytoes	<i>Antennaria rosea</i>
Wormwood/absinthium * (B)	<i>Artemisia absinthium</i>
Field sagewort	<i>Artemisia campestris</i>
Tarragon/dragon sagewort	<i>Artemisia dracunculus</i>
Sand sagebrush	<i>Artemisia filifolia</i>
Fringed sagebrush/prairie sagewort	<i>Artemisia frigida</i>
White sagebrush/Louisiana sagewort	<i>Artemisia ludoviciana</i>
Big sagebrush	<i>Artemisia tridentata</i>
Nodding beggartick/nodding bur-marigold	<i>Bidens cernua</i>
Devil's beggartick/beggar's tick	<i>Bidens frondosa</i>
False boneset	<i>Brickellia eupatorioides</i>
Musk thistle* (B)	<i>Carduus nutans</i>
Diffuse knapweed * (B)	<i>Centaurea diffusa</i>
Spotted knapweed * (B)	<i>Centaurea stoebe</i> ssp. <i>micranthos</i>
Chicory * (C)	<i>Cichorium intybus</i>
Canada thistle * (B)	<i>Cirsium arvense</i>
Prairie thistle/hoary thistle	<i>Cirsium canescens</i>
Yellowspine thistle	<i>Cirsium ochrocentrum</i>
Wavy-leaf thistle	<i>Cirsium undulatum</i>
Bull thistle * (B)	<i>Cirsium vulgare</i>
Horseweed	<i>Conyza canadensis</i>
Plains coreopsis	<i>Coreopsis tinctoria</i>
Garden cosmos *	<i>Cosmos bipinnatus</i>
Carelessweed or giant sumpweed *	<i>Cyclachaena xanthifolia</i>
Fetid marigold	<i>Dyssodia papposa</i>
Purple coneflower	<i>Echinacea purpurea</i>
Rubber rabbitbrush	<i>Ericameria nauseosa</i> var. <i>nauseosa</i>
Spreading fleabane	<i>Erigeron divergens</i>
Shaggy fleabane/shaggy daisy	<i>Erigeron pumilus</i>
Flat top goldenrod	<i>Euthamia graminifolia</i>
Western golden top	<i>Euthamia occidentalis</i>
Bighead pygmycudweed	<i>Evax prolifera</i>
Blanket flower	<i>Gaillardia aristata</i>
Fringed quickweed/shaggy soldier *	<i>Galinsoga quadriradiata</i>
Western marsh cudweed/lowland cudweed	<i>Gnaphalium palustre</i>
Marsh cudweed *	<i>Gnaphalium uliginosum</i>
Curlycup gumweed	<i>Grindelia squarrosa</i>
Broom snake weed	<i>Gutierrezia sarothrae</i>
Common sunflower/annual sunflower	<i>Helianthus annuus</i>
Texas blueweed	<i>Helianthus ciliaris</i>

Prairie sunflower	<i>Helianthus petiolaris</i>
Hairy false goldenaster	<i>Heterotheca villosa</i>
Fineleaf hymenopappus	<i>Hymenopappus filifolius</i>
Prickly lettuce *	<i>Lactuca serriola</i>
Blue lettuce	<i>Lactuca tatarica</i>
Dotted gayfeather/dotted blazing star	<i>Liatris punctata</i>
Rush skeletonweed/rush skeletonplant	<i>Lygodesmia juncea</i>
Bigelow's tansyaster	<i>Machaeranthera bigelovii</i> var. <i>bigelovii</i>
Hoary tansyaster	<i>Machaeranthera canescens</i>
Lacy tansyaster	<i>Machaeranthera pinnatifida</i>
Wavy-leaf false dandelion/prairie false dandelion	<i>Nothocalais cuspidata</i>
Scotch thistle * (B)	<i>Onopordum acanthium</i>
Engelmann's false goldenweed	<i>Oonopsis engelmannii</i>
Prairie groundsel/Platte's groundsel	<i>Packera plattensis</i>
Threetooth ragwort	<i>Packera tridenticulata</i>
Oppositeleaf bahia/plains bahia	<i>Picradeniopsis oppositifolia</i>
Wright's Cudweed	<i>Pseudognaphalium canescens</i>
Cottonbatting plant/winged cudweed	<i>Pseudognaphalium stramineum</i>
Prairie coneflower	<i>Ratibida columnifera</i>
Green prairie coneflower	<i>Ratibida tagetes</i>
Black-eyed Susan	<i>Rudbeckia hirta</i>
Cutleaf vipergrass/false salsify *	<i>Scorzonera laciniata</i>
Riddell's ragwort/riddell groundsel	<i>Senecio riddellii</i>
Broom groundsel	<i>Senecio spartioides</i>
Tall goldenrod	<i>Solidago altissima</i>
Giant goldenrod	<i>Solidago gigantea</i>
Missouri goldenrod	<i>Solidago missouriensis</i>
Soft goldenrod/velvety goldenrod	<i>Solidago mollis</i>
Showy goldenrod	<i>Solidago speciosa</i>
Perennial sowthistle * (C)	<i>Sonchus arvensis</i>
Spiny sow-thistle *	<i>Sonchus asper</i>
Wirelettuce/brownplume wirelettuce	<i>Stephanomeria pauciflora</i>
White heath aster	<i>Symphotrichum ericoides</i> var. <i>ericoides</i>
White prairie aster	<i>Symphotrichum falcatum</i> var. <i>falcatum</i>
Common dandelion *	<i>Taraxacum officinale</i>
Hopi tea greenthread	<i>Thelesperma megapotamicum</i>
Yellow salsify *	<i>Tragopogon dubius</i>
Golden crownbeard/cowpen daisy	<i>Verbesina encelioides</i>
Baldwin's ironweed	<i>Vernonia baldwinii</i>
Rough cocklebur/common cocklebur *	<i>Xanthium strumarium</i>
Barberry family	Berberidaceae
Common barberry *	<i>Berberis vulgaris</i>
Catalpa family	Bignoniaceae
Northern catalpa/showy catalpa *	<i>Catalpa speciosa</i>
Borage family	Boraginaceae
Fendler cryptantha/sanddune cryptantha	<i>Cryptantha fendleri</i>

Little cryptantha/small cryptantha	<i>Cryptantha minima</i>
Houndstongue/gypsyflower * (B)	<i>Cynoglossum officinale</i>
Flatspine stickseed/sand stickseed	<i>Lappula occidentalis</i> var. <i>occidentalis</i>
Puccoon/narrowleaf stoneseed	<i>Lithospermum incisum</i>
Mustard family	Brassicaceae
Desert madwort/desert Alyssum *	<i>Alyssum desertorum</i>
Alyssum/ small-flowered alyssum *	<i>Alyssum simplex</i>
Shepherd's purse *	<i>Capsella bursa-pastoris</i>
Lenspod whitetop *	<i>Cardaria chalepensis</i>
Hoary cress * (B)	<i>Cardaria draba</i>
Common blue mustard/crossflower *	<i>Chorispora tenella</i>
Mountain tansy-mustard	<i>Descurainia incana</i>
Pinnate tansy mustard/western tansymustard	<i>Descurainia pinnata</i>
Herb sophia/flixweed *	<i>Descurainia sophia</i>
Carolina draba/white draba	<i>Draba reptans</i>
Western wallflower	<i>Erysimum asperum</i>
Sanddune wallflower	<i>Erysimum capitatum</i>
Common pepperweed/prairie peppergrass	<i>Lepidium densiflorum</i>
Broadleaved pepperweed/perennial pepperweed * (B)	<i>Lepidium latifolium</i>
Clasping pepperweed *	<i>Lepidium perfoliatum</i>
Foothill bladderpod	<i>Lesquerella ludoviciana</i>
Watercress *	<i>Nasturtium officinale</i>
Spreading yellowcress	<i>Rorippa sinuata</i>
Tall tumble-mustard *	<i>Sisymbrium altissimum</i>
Tumble-mustard/hedgemustard *	<i>Sisymbrium officinale</i>
Field pennycress *	<i>Thlaspi arvense</i>
Cactus family	Cactaceae
Nylon hedgehog cactus	<i>Echinocereus viridiflorus</i>
Spinystar/pincushion cactus/ball cactus	<i>Escobaria vivipara</i> var. <i>vivipara</i>
Plains prickly pear cactus	<i>Opuntia polyacantha</i>
Bellflower family	Campanulaceae
Common harebell/bluebell bellflower	<i>Campanula rotundifolia</i>
Caper family	Capparaceae
Rocky Mountain beepplant	<i>Cleome serrulata</i>
Redwhisker clammyweed	<i>Polanisia dodecandra</i>
Honeysuckle family	Caprifoliaceae
Western snowberry	<i>Symphoricarpos occidentalis</i>
Carnation family	Caryophyllaceae
Baby's breath *	<i>Gypsophila paniculata</i>
Bouncingbet * (B)	<i>Saponaria officinalis</i>
Sand spurry *	<i>Spergularia rubra</i>
Hornwort family	Ceratophyllaceae
Coon's tail/Hornwort	<i>Ceratophyllum demersum</i>
Goosefoot family	Chenopodiaceae
Four-wing saltbush	<i>Atriplex canescens</i>
Twoscale saltbush/orache *	<i>Atriplex heterosperma</i>

Spear saltbush*	<i>Atriplex patula</i>
Fivehorn smotherweed/five hook bassia*	<i>Bassia hyssopifolia</i>
Lambsquarters/white goosefoot*	<i>Chenopodium album</i>
Netseed lambquarters/pitseed goosefoot	<i>Chenopodium berlandieri</i>
Oakleaf goosefoot *	<i>Chenopodium glaucum</i>
Mealy goosefoot	<i>Chenopodium incanum</i>
Narrowleaf goosefoot	<i>Chenopodium leptophyllum</i>
Over's goosefoot *	<i>Chenopodium overi</i>
Red goosefoot	<i>Chenopodium rubrum</i>
Winged pigweed	<i>Cycloloma atriplicifolium</i>
Burningbush/Kochia *	<i>Kochia scoparia</i>
Winterfat	<i>Krascheninnikovia lanata</i>
Slender Russian-thistle *	<i>Salsola collina</i>
Russian-thistle *	<i>Salsola tragus</i>
St. John's-Wort family <span style="float: right;">Clusiaceae</span>	
Common St. Johnswort * (C)	<i>Hypericum perforatum</i>
Spiderwort family <span style="float: right;">Commelinaceae</span>	
Prairie spiderwort	<i>Tradescantia occidentalis</i>
Morning glory family <span style="float: right;">Convolvulaceae</span>	
Field bindweed * (C)	<i>Convolvulus arvensis</i>
Shaggy dwarf morning glory	<i>Evolvulus nuttallianus</i>
Bush morning glory	<i>Ipomoea leptophylla</i>
Cucumber family <span style="float: right;">Cucurbitaceae</span>	
Wild gourd/Stinking gourd	<i>Cucurbita foetidissima</i>
Cypress family <span style="float: right;">Cupressaceae</span>	
Rocky Mountain juniper	<i>Juniperus scopulorum</i>
Sedge family <span style="float: right;">Cyperaceae</span>	
Slenderbeak sedge	<i>Carex athrostachya</i>
Threadleaf sedge	<i>Carex filifolia</i>
Dryspike sedge	<i>Carex siccata</i>
Woolly sedge	<i>Carex pellita</i>
Nebraska sedge	<i>Carex nebrascensis</i>
Sun sedge	<i>Carex inops</i> ssp. <i>heliophila</i>
Clustered field sedge	<i>Carex praegracilis</i>
Bearded flat sedge	<i>Cyperus squarrosus</i>
Redroot flatsedge	<i>Cyperus erythrorhizos</i>
Needle spikerush/slender spikerush	<i>Eleocharis acicularis</i>
Common Spikerush/pale spikerush	<i>Eleocharis macrostachya</i>
Schweinitz's flatsedge	<i>Cyperus schweinitzii</i>
Chairmaker's bulrush	<i>Schoenoplectus americanus</i>
Great bulrush	<i>Schoenoplectus lacustris</i>
Common threesquare bulrush	<i>Schoenoplectus pungens</i>
Rocky Mountain bulrush	<i>Schoenoplectus saximontanus</i>
Softstem bullrush	<i>Schoenoplectus tabernaemontani</i>
Oleaster family <span style="float: right;">Elaeagnaceae</span>	
Russian-olive * (B)	<i>Elaeagnus angustifolia</i>

Silver buffaloberry	<i>Shepherdia argentea</i>
Horsetail family	Equisetaceae
Smooth horsetail	<i>Equisetum laevigatum</i>
Spurge family	Euphorbiaceae
Ribseed sandmat	<i>Chamaesyce glyptosperma</i>
Spotted sandmat/spotted spurge	<i>Chamaesyce maculata</i>
Prostrate sandmat/prostrate spurge	<i>Chamaesyce prostrata</i>
Thymeleaf sandmat	<i>Chamaesyce serpyllifolia</i>
Texas croton	<i>Croton texensis</i>
Toothed spurge	<i>Euphorbia dentata</i>
Leafy spurge * (B)	<i>Euphorbia esula var. uralensis</i>
Snow-on-the-mountain	<i>Euphorbia marginata</i>
Warty spurge	<i>Euphorbia spathulata</i>
Pea family	Fabaceae
Lead plant	<i>Amorpha canescens</i>
Purple milkvetch	<i>Astragalus agrestis</i>
Two-grooved milkvetch	<i>Astragalus bisulcatus</i>
Painted milkvetch	<i>Astragalus ceramicus</i>
Ground plum	<i>Astragalus crassicaarpus</i>
Lotus milkvetch	<i>Astragalus lotiflorus</i>
Missouri milkvetch	<i>Astragalus missouriensis</i>
Golden prairie-clover	<i>Dalea aurea</i>
Andean prairie clover/compact prairie-clover	<i>Dalea cylindriceps</i>
Purple prairie-clover	<i>Dalea purpurea</i>
Honey locust *	<i>Gleditsia triacanthos</i>
Wild licorice/American licorice	<i>Glycyrrhiza lepidota</i>
Silvery lupine	<i>Lupinus argenteus</i>
Black medick*	<i>Medicago lupulina</i>
Alfalfa *	<i>Medicago sativa</i>
White sweetclover *	<i>Melilotus albus</i>
Yellow sweetclover *	<i>Melilotus officinalis</i>
Purple locoweed	<i>Oxytropis lambertii</i>
Lemon scurfpea/narrowleaf scurfpea	<i>Psoralidium lanceolatum</i>
Slimflower scurfpea	<i>Psoralidium tenuiflorum</i>
New Mexico locust*	<i>Robinia neomexicana</i>
Black locust*	<i>Robinia pseudoacacia</i>
Silky sophora	<i>Sophora nuttalliana</i>
Strawberry clover*	<i>Trifolium fragiferum</i>
American vetch	<i>Vicia americana</i>
Wooly vetch *	<i>Vicia villosa</i>
Oak family	Fagaceae
White oak*	<i>Quercus alba</i>
Fumitory family	Fumariaceae
Golden smoke/golden corydalis	<i>Corydalis aurea</i>
Geranium family	Geraniaceae
Redstem filaree/redstem stork's bill * (C)	<i>Erodium cicutarium</i>

Gooseberry family		Grossulariaceae
Golden currant	<i>Ribes aureum</i>	
Water milfoil family		Haloragaceae
Shortspike watermilfoil	<i>Myriophyllum sibiricum</i>	
Iris family		Iridaceae
Rocky Mountain iris/blue flag	<i>Iris missouriensis</i>	
Rush family		Juncaceae
Arctic rush	<i>Juncus arcticus</i> var. <i>balticus</i>	
Toad rush	<i>Juncus bufonius</i>	
Roundfruit rush*	<i>Juncus compressus</i>	
Inland rush	<i>Juncus interior</i>	
Poverty rush	<i>Juncus tenuis</i>	
Mint family		Lamiaceae
Rough false pennyroyal	<i>Hedeoma hispida</i>	
American water horehound	<i>Lycopus americanus</i>	
Field mint/wild mint	<i>Mentha arvensis</i>	
Spearmint*	<i>Mentha spicata</i>	
Plains beebalm/pony beebalm	<i>Monarda pectinata</i>	
Catnip*	<i>Nepeta cataria</i>	
Blue sage/Azure blue sage	<i>Salvia azurea</i>	
Lanceleaf Sage/Rocky Mountain sage	<i>Salvia reflexa</i>	
Marsh skullcap	<i>Scutellaria galericulata</i>	
Canada germander/western germander	<i>Teucrium canadense</i>	
Duckweed family		Lemnaceae
Common duckweed	<i>Lemna minor</i>	
Lily family		Liliaceae
Garden asparagus *	<i>Asparagus officinalis</i>	
Common sand lily/common starlily	<i>Leucocrinum montanum</i>	
Feathery false lily of the valley	<i>Maianthemum racemosum</i> ssp. <i>amplexicaule</i>	
Meadow deathcamas	<i>Zigadenus venenosus</i> var. <i>gramineus</i>	
Flax family		Linaceae
Lewis flax/blue flax	<i>Linum lewisii</i>	
Loasa family		Loasaceae
Whitestem blazingstar	<i>Mentzelia albicaulis</i>	
Bractless blazingstar	<i>Mentzelia nuda</i>	
Loosestrife family	<i>Lythraceae</i>	
Grand redstem/toothcup	<i>Ammannia robusta</i>	
Mallow family		Malvaceae
Velvetleaf * (C)	<i>Abutilon theophrasti</i>	
Purple poppymallow/winecups	<i>Callirhoe involucrata</i>	
Flower of an hour*	<i>Hibiscus trionum</i>	
Common mallow *	<i>Malva neglecta</i>	
Alkali mallow *	<i>Malvella leprosa</i>	
Scarlet globemallow	<i>Sphaeralcea coccinea</i>	
Pepperwort family		Marsileaceae

Hairy water clover	<i>Marsilea vestita</i>
Mulberry family	Moraceae
White mulberry*	<i>Morus alba</i>
Four-o'clock family	Nyctaginaceae
Snowball sand verbena/fragrant sand verbena	<i>Abronia fragrans</i>
Narrowleaf four o'clock/narrowleaf umbrella-wort	<i>Oxybaphus linearis</i>
Heartleaf four o'clock/heartleaf umbrella-wort	<i>Oxybaphus nyctagineus</i>
Olive family	Oleaceae
Green ash	<i>Fraxinus pennsylvanica</i>
European Privet*	<i>Ligustrum vulgare</i>
Common lilac*	<i>Syringa vulgaris</i>
Evening primrose family	Onagraceae
Yellow sundrops/serrate evening-primrose	<i>Calylophus serrulatus</i>
Panicled willow herb/tall annual willowherb	<i>Epilobium brachycarpum</i>
American willow-herb/fringed willowherb	<i>Epilobium ciliatum</i>
Scarlet beeblossom	<i>Gaura coccinea</i>
Velvetweed	<i>Gaura parviflora</i>
Pinyon groundsmoke/branching groundsmoke	<i>Gayophytum ramosissimum</i>
Prairie evening-primrose/whitest evening primrose	<i>Oenothera albicaulis</i>
Tufted evening primrose/stemless evening-primrose	<i>Oenothera caespitosa</i>
Crownleaf evening primrose	<i>Oenothera coronopifolia</i>
Nuttall's evening-primrose	<i>Oenothera nuttallii</i>
Hairy evening primrose	<i>Oenothera villosa</i>
Orchid family	Orchidaceae
Striped coralroot/hooded coralroot	<i>Corallorhiza striata</i>
Poppy family	Papaveraceae
Crested prickly poppy	<i>Argemone polyanthemos</i>
Pine family	Pinaceae
Blue spruce	<i>Picea pungens</i>
Austrian pine*	<i>Pinus nigra</i>
Ponderosa pine	<i>Pinus ponderosa</i>
Scots pine*	<i>Pinus sylvestris</i>
Plantain family	Plantaginaceae
Narrowleaf plantain*	<i>Plantago lanceolata</i>
Broadleaf plantain*	<i>Plantago major</i>
Woolly plantain	<i>Plantago patagonica</i>
Grass family	Poaceae
Indian ricegrass	<i>Achnatherum hymenoides</i>
Jointed goatgrass * (B)	<i>Aegilops cylindrica</i>
Crested wheatgrass *	<i>Agropyron cristatum</i>
Redtop*	<i>Agrostis gigantea</i>
Big bluestem	<i>Andropogon gerardii</i>
Sand bluestem	<i>Andropogon hallii</i>
Poverty threeawn	<i>Aristida divaricata</i>
Fendler's threeawn	<i>Aristida purpurea</i> var. <i>fendleriana</i>
Purple threeawn	<i>Aristida purpurea</i> var. <i>purpurea</i>

Common oat/cultivated oats *	<i>Avena sativa</i>
Sloughgrass	<i>Beckmannia syzigachne</i>
Yellow bluestem*	<i>Bothriochloa ischaemum</i>
Silver beardgrass	<i>Bothriochloa laguroides</i>
Sideoats grama	<i>Bouteloua curtipendula</i>
Blue grama	<i>Bouteloua gracilis</i>
Smooth brome *	<i>Bromus inermis</i>
Japanese brome/field brome *	<i>Bromus japonicus</i>
Cheatgrass/downy brome *( C )	<i>Bromus tectorum</i>
Buffalograss	<i>Buchloe dactyloides</i>
Prairie sandreed	<i>Calamovilfa longifolia</i>
Longspine sandbur/mat sandbur	<i>Cenchrus longispinus</i>
Tumble windmillgrass	<i>Chloris verticillata</i>
Feather fingergrass	<i>Chloris virgata</i>
Bermudagrass *	<i>Cynodon dactylon</i>
Hairy crabgrass *	<i>Digitaria sanguinalis</i>
Inland saltgrass/desert saltgrass	<i>Distichlis stricta</i>
Barnyardgrass *	<i>Echinochloa crus-galli</i>
Canada wildrye	<i>Elymus canadensis</i>
Squirreltail	<i>Elymus elymoides</i>
Thickspike wheatgrass *	<i>Elymus lanceolatus</i> ssp. <i>lanceolatus</i>
Quackgrass * (C)	<i>Elymus repens</i>
Slender wheatgrass	<i>Elymus trachycaulus</i>
Stinkgrass *	<i>Eragrostis cilianensis</i>
Tufted lovegrass	<i>Eragrostis pectinacea</i>
Red lovegrass	<i>Eragrostis secundiflora</i>
Purple lovegrass	<i>Eragrostis spectabilis</i>
Needle and thread	<i>Hesperostipa comata</i>
Foxtail barley	<i>Hordeum jubatum</i>
Little barley	<i>Hordeum pusillum</i>
Junegrass	<i>Koeleria macrantha</i>
Rice cutgrass	<i>Leersia oryzoides</i>
Perennial ryegrass *	<i>Lolium perenne</i>
Alkali muhly/scratchgrass	<i>Muhlenbergia asperifolia</i>
Sandhill muhly	<i>Muhlenbergia pungens</i>
Marsh muhly	<i>Muhlenbergia racemosa</i>
Ring muhly	<i>Muhlenbergia torreyi</i>
False buffalograss	<i>Munroa squarrosa</i>
Green needlegrass	<i>Nassella viridula</i>
Witchgrass	<i>Panicum capillare</i>
Switchgrass	<i>Panicum virgatum</i>
Western wheatgrass	<i>Pascopyrum smithii</i>
Dallisgrass *	<i>Paspalum dilatatum</i>
Reed canarygrass *	<i>Phalaris arundinacea</i>
Timothy *	<i>Phleum pratense</i>
Canada bluegrass *	<i>Poa compressa</i>

Kentucky bluegrass *	<i>Poa pratensis</i>
Sandberg bluegrass	<i>Poa secunda</i>
Annual rabbitsfoot grass*	<i>Polypogon monspeliensis</i>
Tumblegrass	<i>Schedonnardus paniculatus</i>
Tall fescue *	<i>Schedonorus arundinaceus</i>
Meadow fescue *	<i>Schedonorus pratensis</i>
Little bluestem	<i>Schizachyrium scoparium</i>
Cereal rye *	<i>Secale cereale</i>
Yellow foxtail*	<i>Setaria pumila</i> ssp. <i>pumila</i>
Green bristlegrass*	<i>Setaria viridis</i>
Yellow indiagrass	<i>Sorghastrum nutans</i>
Grain sorghum /Sorghum Sudan hybrid*	<i>Sorghum bicolor</i> ssp. <i>bicolor</i>
Prairie cordgrass	<i>Spartina pectinata</i>
Praire wedgegrass	<i>Sphenopholis obtusata</i>
Alkalai sacaton	<i>Sporobolus airoides</i>
Sand dropseed	<i>Sporobolus cryptandrus</i>
Intermediate wheatgrass/pubescent wheatgrass*	<i>Thinopyrum intermedium</i>
Intermediate wheatgrass *	<i>Thinopyrum intermedium</i>
Tall wheatgrass *	<i>Thinopyrum ponticum</i>
Slim tridens	<i>Tridens muticus</i>
Eastern gamma grass	<i>Tripsacum dactyloides</i>
Winter wheat *	<i>Triticum</i> sp.
Six weeks fescue	<i>Vulpia octoflora</i>
Phlox family	Polemoniaceae
Iron ipomopsis	<i>Ipomopsis laxiflora</i>
Granite prickly phlox/Prickly gilia	<i>Linanthus pungens</i>
Buckwheat family	Polygonaceae
Annual wild buckwheat	<i>Eriogonum annuum</i>
Spreading buckwheat	<i>Eriogonum effusum</i>
Black bindweed *	<i>Polygonum convolvulus</i> var. <i>Convolvulus</i>
Oval-leaf knotweed *	<i>Polygonum arenastrum</i>
Prostrate knotweed *	<i>Polygonum aviculare</i>
Smartweed	<i>Polygonum lapathifolia</i>
Pennsylvania smartweed/pinkweed	<i>Polygonum pennsylvanicum</i>
Spotted lady's thumb *	<i>Polygonum persicaria</i>
Bushy knotweed/branched knotweed	<i>Polygonum ramosissimum</i>
Curly dock *	<i>Rumex crispus</i>
Golden dock	<i>Rumex maritimus</i>
Narrowleaf dock *	<i>Rumex stenophyllus</i>
Willow Dock/Mexican dock	<i>Rumex salicifolius</i> var. <i>mexicanus</i>
Veiny dock/wild begonia	<i>Rumex venosus</i>
Purslane family	Portulacaceae
Common purslane/little hogweed*	<i>Portulaca oleracea</i>
Prairie fameflower/sunbright	<i>Phemeranthus parviflorus</i>
Primrose family	Primulaceae
Fringed loose-strife	<i>Steironema ciliatum</i>

Buttercup family		Ranunculaceae
Western virgin's bower/western white clematis	<i>Clematis ligusticifolia</i>	
Plains larkspur	<i>Delphinium carolinianum</i> ssp. <i>virescens</i>	
Tiny mousetail	<i>Myosurus minimus</i>	
Rose family		Rosaceae
Common apple *	<i>Malus pumila</i>	
Norwegian cinquefoil	<i>Potentilla norvegica</i>	
Cinquefoil *	<i>Potentilla paradoxa</i>	
Prairie cinquefoil/Pennsylvania cinquefoil	<i>Potentilla pensylvanica</i>	
American plum	<i>Prunus americana</i>	
Sand cherry	<i>Prunus pumila</i> var. <i>besseyi</i>	
Black chokecherry	<i>Prunus virginiana</i> var. <i>melanocarpa</i>	
Prairie rose	<i>Rosa arkansana</i>	
Woods' rose	<i>Rosa woodsii</i>	
Willow family		Salicaceae
White poplar *	<i>Populus alba</i>	
Eastern cottonwood/plains cottonwood	<i>Populus deltoides</i>	
Quaking aspen	<i>Populus tremuloides</i>	
Peachleaf willow	<i>Salix amygdaloides</i>	
Coyote willow/narrowleaf willow	<i>Salix exigua</i>	
Shining willow	<i>Salix lucida</i>	
Sandalwood family		Santalaceae
Bastard toadflax	<i>Comandra umbellata</i>	
Figwort family		Scrophulariaceae
Water mudwort	<i>Limosella aquatica</i>	
Dalmatian toadflax * (B)	<i>Linaria dalmatica</i> ssp. <i>dalmatica</i>	
Butter and eggs/yellow toadflax * (B)	<i>Linaria vulgaris</i>	
Roundleaf monkeyflower/smooth monkeyflower	<i>Mimulus glabratus</i>	
White beardtongue/white penstemon	<i>Penstemon albidus</i>	
Broadbeard beardtongue/narrowleaf penstemon	<i>Penstemon angustifolius</i>	
Shell-leaf penstemon/large beardtongue	<i>Penstemon grandiflorus</i>	
Common mullein * (C)	<i>Verbascum thapsus</i>	
American speedwell	<i>Veronica americana</i>	
Water speedwell	<i>Veronica anagallis-aquatica</i>	
Quassia family		Simaroubaceae
Tree-of-heaven *	<i>Ailanthus altissima</i>	
Nightshade family		Solanaceae
Matrimony bush *	<i>Lycium barbarum</i>	
Ivyleaf groundcherry	<i>Physalis hederifolia</i>	
Clammy groundcherry	<i>Physalis heterophylla</i>	
Prairie groundcherry	<i>Physalis hispida</i>	
Virginia groundcherry	<i>Physalis virginiana</i>	
Chinese lantern	<i>Quincula lobata</i>	
Hairy nightshade/hoar nightshade*	<i>Solanum physalifolium</i>	
Buffalo bur	<i>Solanum rostratum</i>	
Cutleaf nightshade	<i>Solanum triflorum</i>	

Tamarix family		Tamaricaceae
Tamarisk * (B)	<i>Tamarix</i> spp.	
Cattail family		Typhaceae
Narrowleaf cattail *	<i>Typha angustifolia</i>	
Broadleaf cattail	<i>Typha latifolia</i>	
Elm family		Ulmaceae
Netleaf hackberry	<i>Celtis laevigata</i> var. <i>reticulata</i>	
American elm*	<i>Ulmus americana</i>	
Siberian elm *	<i>Ulmus pumila</i>	
Nettle family		Urticaceae
Stinging nettle	<i>Urtica dioica</i>	
Vervain family		Verbenaceae
Wedgeleaf fogfruit/wedgeleaf	<i>Phyla cuneifolia</i>	
Prostrate vervain/bigbract verbena	<i>Verbena bracteata</i>	
Swamp vervain/blue vervain	<i>Verbena hastata</i>	
Violet family		Violaceae
Nuttall's violet/yellow violet	<i>Viola nuttallii</i>	
Grape family		Vitaceae
Western woodbine	<i>Parthenocissus vitacea</i>	
Riverbank grape	<i>Vitis riparia</i>	
Horned pondweed family		Zannichelliaceae
Horned pondweed	<i>Zannichellia palustris</i>	
Creosote bush family		Zygophyllaceae
Puncturevine * (C)	<i>Tribulus terrestris</i>	

\* Introduced species.

(A) (B) (C) Colorado noxious weed listing.

**Table G-2. Fish found on the Rocky Mountain Arsenal National Wildlife Refuge, 2014.**

Common name	Scientific name
Common carp*	<i>Cyprinus carpio</i>
Grass carp*	<i>Ctenopharyngodon idella</i>
Fathead minnow^	<i>Pimephales promelas</i>
Black bullhead	<i>Ameiurus melas</i>
Channel catfish^	<i>Ictalurus punctatus</i>
Northern pike	<i>Esox lucius</i>
Brook stickleback	<i>Culaea inconstans</i>
Black crappie	<i>Pomoxis nigromaculatus</i>
Green sunfish	<i>Lepomis cyanellus</i>
Bluegill^	<i>Lepomis macrochirus</i>
Pumpkinseed	<i>Lepomis gibbosus</i>
Largemouth bass^	<i>Micropterus salmoides</i>
Western mosquitofish	<i>Gambusia affinis</i>
Yellow perch	<i>Perca flavescens</i>

\* Exotic.

^ Stocked native transplant.

**Table G-3. Herptiles found on the Rocky Mountain Arsenal National Wildlife Refuge, 2014.**

<i>Common name</i>	<i>Scientific name</i>
<b>Amphibians</b>	
Tiger salamander ^	<i>Ambystoma tigrinum</i>
Plains spadefoot	<i>Spea bombifrons</i>
Great plains toad	<i>Anaxyrus cognatus</i>
Woodhouse's toad	<i>Anaxyrus woodhousii</i>
Midland chorus frog	<i>Pseudacris triseriata</i>
Bullfrog ^	<i>Lithobates catesbeianus</i>
Northern leopard frog	<i>Lithobates pipiens</i>
<b>Reptiles</b>	
Snapping turtle ^	<i>Chelydra serpentina</i>
Western painted turtle	<i>Chrysemys picta</i>
Ornate box turtle	<i>Terrepene ornata</i>
Red-eared slider *	<i>Trachemys scripta</i>
Spiny softshell	<i>Apalone spinifera</i>
Lesser earless lizard	<i>Holbrookia maculata</i>
Short-horned lizard	<i>Phrynosoma hernandesi</i>
Prairie lizard	<i>Sceloporus undulatus</i>
Many-lined skink	<i>Plestiodon multivirgatus</i>
Six-lined racerunner	<i>Cnemidophorus sexlineata</i>
Yellowbelly racer	<i>Coluber constrictor</i>
Western hognose snake	<i>Heterodon nasicus</i>
Bullsnake	<i>Pituophis catenifer</i>
Western terrestrial garter snake	<i>Thamnophis elegans</i>
Plains garter snake	<i>Thamnophis radix</i>
Common garter snake	<i>Thamnophis sirtalis</i>
Prairie rattlesnake	<i>Crotalus viridis</i>

^ Game species.

\* Unregulated.

**Table G-4. Birds found on the Rocky Mountain Arsenal National Wildlife Refuge, 2014.**

<i>Common name</i>	<i>Scientific name</i>
<b>Geese, swans, and ducks</b>	
Greater white-fronted goose *	<i>Anser albifrons</i>
Snow goose	<i>Chen caerulescens</i>
Ross's goose *	<i>Chen rossii</i>
Cackling goose	<i>Branta hutchinsii</i>
Canada goose +	<i>Branta canadensis</i>
Trumpeter swan *	<i>Cygnus buccinator</i>
Tundra swan *	<i>Cygnus columbianus</i>
Wood duck +	<i>Aix sponsa</i>
Gadwall	<i>Anas strepera</i>
Eurasian wigeon *	<i>Anas penelope</i>
American wigeon	<i>Anas americana</i>
Mallard +	<i>Anas platyrhynchos</i>

Blue-winged teal +	<i>Anas discors</i>
Cinnamon teal	<i>Anas cyanoptera</i>
Northern shoveler	<i>Anas clypeata</i>
Northern pintail +	<i>Anas acuta</i>
Green-winged teal	<i>Anas crecca</i>
Canvasback	<i>Aythya valisineria</i>
Redhead +	<i>Aythya americana</i>
Ring-necked duck	<i>Aythya collaris</i>
Greater scaup *	<i>Aythya marila</i>
Lesser scaup	<i>Aythya affinis</i>
Surf scoter *	<i>Melanitta perspicillata</i>
White-winged scoter *	<i>Melanitta fusca</i>
Black scoter *	<i>Melanitta americana</i>
Bufflehead	<i>Bucephala albeola</i>
Common goldeneye	<i>Bucephala clangula</i>
Barrow's goldeneye	<i>Bucephala islandica</i>
Hooded merganser	<i>Lophodytes cucullatus</i>
Common merganser	<i>Mergus merganser</i>
Red-breasted merganser	<i>Mergus serrator</i>
Ruddy duck	<i>Oxyura jamaicensis</i>
Loons	
Pacific loon *	<i>Gavia pacifica</i>
Common loon *	<i>Gavia immer</i>
Grebes	
Pied-billed grebe +	<i>Podilymbus podiceps</i>
Horned grebe *	<i>Podiceps auritus</i>
Red-necked grebe *	<i>Podiceps grisegena</i>
Eared grebe	<i>Podiceps nigricollis</i>
Western grebe	<i>Aechmophorus occidentalis</i>
Clark's grebe *	<i>Aechmophorus clarkii</i>
Cormorants	
Double-crested cormorant	<i>Phalacrocorax auritus</i>
Pelicans	
American white pelican	<i>Pelecanus erythrorhynchos</i>
Bitterns, herons, and egrets	
American bittern *	<i>Botaurus lentiginosus</i>
Great blue heron	<i>Ardea herodias</i>
Great egret *	<i>Ardea alba</i>
Snowy egret	<i>Egretta thula</i>
Little blue heron *	<i>Egretta caerulea</i>
Tricolored heron *	<i>Egretta tricolor</i>
Cattle egret *	<i>Bubulcus ibis</i>
Green heron *	<i>Butorides virescens</i>
Black-crowned night-heron	<i>Nycticorax nycticorax</i>
Ibis	
White-faced ibis	<i>Plegadis chihi</i>

New world vultures	
Turkey vulture	<i>Cathartes aura</i>
Osprey, hawks, and eagles	
Osprey	<i>Pandion haliaetus</i>
Bald eagle +	<i>Haliaeetus leucocephalus</i>
Northern harrier +	<i>Circus cyaneus</i>
Sharp-shinned hawk	<i>Accipiter striatus</i>
Cooper's hawk	<i>Accipiter cooperii</i>
Northern goshawk *	<i>Accipiter gentilis</i>
Broad-winged hawk *	<i>Buteo platypterus</i>
Swainson's hawk +	<i>Buteo swainsoni</i>
Red-tailed hawk +	<i>Buteo jamaicensis</i>
Ferruginous hawk	<i>Buteo regalis</i>
Rough-legged hawk	<i>Buteo lagopus</i>
Golden eagle	<i>Aquila chrysaetos</i>
Rails and coots	
Virginia rail +	<i>Rallus limicola</i>
Sora	<i>Porzana carolina</i>
American coot +	<i>Fulica americana</i>
Cranes	
Sandhill crane	<i>Grus canadensis</i>
Stilts and avocets	
Black-necked stilt *	<i>Himantopus mexicanus</i>
American avocet +	<i>Recurvirostra americana</i>
Plovers	
Black-bellied plover *	<i>Pluvialis squatarola</i>
American golden-plover *	<i>Pluvialis dominica</i>
Snowy plover *	<i>Charadrius nivosus</i>
Semipalmated plover *	<i>Charadrius semipalmatus</i>
Killdeer +	<i>Charadrius vociferus</i>
Mountain plover *	<i>Charadrius montanus</i>
Sandpipers and phalaropes	
Spotted sandpiper +	<i>Actitis macularius</i>
Solitary sandpiper	<i>Tringa solitaria</i>
Greater yellowlegs	<i>Tringa melanoleuca</i>
Willet	<i>Tringa semipalmata</i>
Lesser yellowlegs	<i>Tringa flavipes</i>
Upland sandpiper *	<i>Bartramia longicauda</i>
Whimbrel *	<i>Numenius phaeopus</i>
Long-billed curlew	<i>Numenius americanus</i>
Marbled godwit *	<i>Limosa fedoa</i>
Stilt sandpiper *	<i>Calidris himantopus</i>
Sanderling *	<i>Calidris alba</i>
Baird's sandpiper	<i>Calidris bairdii</i>
Least sandpiper *	<i>Calidris minutilla</i>
White-rumped sandpiper *	<i>Calidris fuscicollis</i>

Pectoral sandpiper *	<i>Calidris melanotos</i>
Semipalmated sandpiper *	<i>Calidris pusilla</i>
Western sandpiper *	<i>Calidris mauri</i>
Long-billed dowitcher	<i>Limnodromus scolopaceus</i>
Wilson's snipe	<i>Gallinago delicata</i>
Wilson's phalarope	<i>Phalaropus tricolor</i>
Red-necked phalarope *	<i>Phalaropus lobatus</i>
Gulls and terns	
Sabine's gull *	<i>Xema sabini</i>
Bonaparte's gull *	<i>Chroicocephalus philadelphia</i>
Franklin's gull	<i>Leucophaeus pipixcan</i>
Ring-billed gull	<i>Larus delawarensis</i>
California gull	<i>Larus californicus</i>
Herring gull	<i>Larus argentatus</i>
Thayer's gull *	<i>Larus thayeri</i>
Lesser black-backed gull *	<i>Larus fuscus</i>
Caspian tern *	<i>Hydroprogne caspia</i>
Black tern *	<i>Chlidonias niger</i>
Common tern *	<i>Sterna hirundo</i>
Arctic tern	<i>Sterna paradisaea</i>
Forster's tern *	<i>Sterna forsteri</i>
Pigeons and doves	
Rock pigeon (I) +	<i>Columba livia</i>
Eurasian collared-dove (I)+	<i>Streptopelia decaocto</i>
White-winged dove *	<i>Zenaida asiatica</i>
Mourning dove +	<i>Zenaida macroura</i>
Cuckoos	
Yellow-billed cuckoo *	<i>Coccyzus americanus</i>
Barn owls	
Barn owl	<i>Tyto alba</i>
Typical owls	
Eastern screech-owl *	<i>Megascops asio</i>
Great horned owl +	<i>Bubo virginianus</i>
Snowy owl *	<i>Bubo scandiacus</i>
Burrowing owl +	<i>Athene cunicularia</i>
Long-eared owl +	<i>Asio otus</i>
Short-eared Owl +	<i>Asio flammeus</i>
Northern saw-whet owl *	<i>Aegolius acadicus</i>
Nightjars	
Common nighthawk +	<i>Chordeiles minor</i>
Common poorwill *	<i>Phalaenoptilus nuttallii</i>
Swifts	
Chimney swift *	<i>Chaetura pelagica</i>
Hummingbirds	
Broad-tailed hummingbird *	<i>Selasphorus platycercus</i>
Rufous hummingbird *	<i>Selasphorus rufus</i>

Calliope hummingbird *	<i>Selasphorus calliope</i>
Kingfishers	
Belted kingfisher +	<i>Megaceryle alcyon</i>
Woodpeckers	
Lewis's woodpecker *	<i>Melanerpes lewis</i>
Red-headed woodpecker +	<i>Melanerpes erythrocephalus</i>
Red-bellied woodpecker *	<i>Melanerpes carolinus</i>
Red-naped sapsucker *	<i>Sphyrapicus nuchalis</i>
Downy woodpecker +	<i>Picoides pubescens</i>
Hairy woodpecker +	<i>Picoides villosus</i>
Northern flicker +	<i>Colaptes auratus</i>
Falcons and caracaras	
American kestrel +	<i>Falco sparverius</i>
Merlin	<i>Falco columbarius</i>
Peregrine falcon	<i>Falco peregrinus</i>
Prairie falcon	<i>Falco mexicanus</i>
Tyrant flycatchers	
Olive-sided flycatcher *	<i>Contopus cooperi</i>
Western wood-pewee +	<i>Contopus sordidulus</i>
Willow flycatcher *	<i>Empidonax traillii</i>
Least flycatcher *	<i>Empidonax minimus</i>
Hammond's flycatcher *	<i>Empidonax hammondi</i>
Gray flycatcher *	<i>Empidonax wrightii</i>
Dusky flycatcher	<i>Empidonax oberholseri</i>
Cordilleran flycatcher *	<i>Empidonax occidentalis</i>
Eastern phoebe *	<i>Sayornis phoebe</i>
Say's phoebe +	<i>Sayornis saya</i>
Ash-throated flycatcher *	<i>Myiarchus cinerascens</i>
Great crested flycatcher *	<i>Myiarchus crinitus</i>
Cassin's kingbird	<i>Tyrannus vociferans</i>
Western kingbird +	<i>Tyrannus verticalis</i>
Eastern kingbird +	<i>Tyrannus tyrannus</i>
Scissor-tailed flycatcher *	<i>Tyrannus forficatus</i>
Shrikes	
Loggerhead shrike +	<i>Lanius ludovicianus</i>
Northern shrike	<i>Lanius excubitor</i>
Vireos	
Plumbeous vireo *	<i>Vireo plumbeus</i>
Cassin's vireo 8	<i>Vireo cassinii</i>
Blue-headed vireo *	<i>Vireo solitarius</i>
Warbling vireo	<i>Vireo gilvus</i>
Philadelphia vireo *	<i>Vireo philadelphicus</i>
Red-eyed vireo *	<i>Vireo olivaceus</i>
Jays and crows	
Blue jay +	<i>Cyanocitta cristata</i>
Western scrub-jay *	<i>Aphelocoma californica</i>

Black-billed magpie +	<i>Pica hudsonia</i>
American crow	<i>Corvus brachyrhynchos</i>
Common raven *	<i>Corvus corax</i>
Larks	
Horned lark +	<i>Eremophila alpestris</i>
Swallows	
Tree swallow +	<i>Tachycineta bicolor</i>
Violet-green swallow	<i>Tachycineta thalassina</i>
Northern rough-winged swallow +	<i>Stelgidopteryx serripennis</i>
Bank swallow +	<i>Riparia riparia</i>
Barn swallow +	<i>Hirundo rustica</i>
Cliff swallow +	<i>Petrochelidon pyrrhonota</i>
Chickadees and titmice	
Black-capped chickadee +	<i>Poecile atricapillus</i>
Mountain chickadee *	<i>Poecile gambeli</i>
Nuthatches	
Red-breasted nuthatch *	<i>Sitta canadensis</i>
White-breasted nuthatch +	<i>Sitta carolinensis</i>
Pygmy nuthatch *	<i>Sitta pygmaea</i>
Creepers	
Brown creeper *	<i>Certhia americana</i>
Wrens	
House wren +	<i>Troglodytes aedon</i>
Rock wren	<i>Salpinctes obsoletus</i>
Winter wren *	<i>Troglodytes hiemalis</i>
Marsh wren *	<i>Cistothorus palustris</i>
Bewick's wren *	<i>Thryomanes bewickii</i>
Gnatcatchers	
Blue-gray gnatcatcher +	<i>Poliophtila caerulea</i>
Kinglets	
Golden-crowned kinglet *	<i>Regulus satrapa</i>
Ruby-crowned kinglet	<i>Regulus calendula</i>
Thrushes	
Eastern bluebird +	<i>Sialia sialis</i>
Western bluebird *	<i>Sialia mexicana</i>
Mountain bluebird	<i>Sialia currucoides</i>
Townsend's solitaire	<i>Myadestes townsendi</i>
Veery *	<i>Catharus fuscescens</i>
Gray-cheeked thrush *	<i>Catharus minimus</i>
Swainson's thrush	<i>Catharus ustulatus</i>
Hermit thrush	<i>Catharus guttatus</i>
Wood thrush *	<i>Hylocichla mustelina</i>
American robin +	<i>Turdus migratorius</i>
Mimic thrushes	
Gray catbird *	<i>Dumetella carolinensis</i>
Brown thrasher	<i>Toxostoma rufum</i>

Sage thrasher	<i>Oreoscoptes montanus</i>
Northern mockingbird +	<i>Mimus polyglottos</i>
Starlings	
European starling (I)+	<i>Sturnus vulgaris</i>
Pipits	
American pipit *	<i>Anthus rubescens</i>
Waxwings	
Bohemian waxwing *	<i>Bombycilla garrulus</i>
Cedar waxwing *	<i>Bombycilla cedrorum</i>
Longspurs	
Lapland longspur *	<i>Calcarius lapponicus</i>
McCown's longspur *	<i>Rhynchophanes mccownii</i>
Wood warblers	
Ovenbird *	<i>Seiurus aurocapilla</i>
Worm-eating warbler *	<i>Helmitheros vermivorum</i>
Northern waterthrush *	<i>Parkesia noveboracensis</i>
Black-and-white warbler *	<i>Mniotilta varia</i>
Orange-crowned warbler	<i>Oreothlypis celata</i>
Nashville warbler *	<i>Oreothlypis ruficapilla</i>
Virginia's warbler	<i>Oreothlypis virginiae</i>
MacGillivray's warbler *	<i>Geothlypis tolmiei</i>
Common yellowthroat +	<i>Geothlypis trichas</i>
Hooded warbler *	<i>Setophaga citrina</i>
American redstart *	<i>Setophaga ruticilla</i>
Bay-breasted warbler *	<i>Setophaga castanea</i>
Yellow warbler +	<i>Setophaga petechia</i>
Blackpoll warbler +	<i>Setophaga striata</i>
Black-throated blue warbler *	<i>Setophaga caerulescens</i>
Palm warbler *	<i>Setophaga palmarum</i>
Yellow-rumped warbler	<i>Setophaga coronata</i>
Prairie warbler *	<i>Setophaga discolor</i>
Black-throated gray warbler *	<i>Setophaga nigrescens</i>
Townsend's warbler *	<i>Setophaga townsendi</i>
Hermit warbler *	<i>Setophaga occidentalis</i>
Wilson's warbler	<i>Cardellina pusilla</i>
Yellow-breasted chat *	<i>Icteria virens</i>
Towhees and sparrows	
Green-tailed towhee	<i>Pipilo chlorurus</i>
Spotted towhee	<i>Pipilo maculatus</i>
Cassin's sparrow	<i>Peucaea cassinii</i>
American tree sparrow	<i>Spizella arborea</i>
Chipping sparrow	<i>Spizella passerina</i>
Clay-colored sparrow	<i>Spizella pallida</i>
Brewer's sparrow	<i>Spizella breweri</i>
Field sparrow *	<i>Spizella pusilla</i>
Vesper sparrow +	<i>Poocetes gramineus</i>

Lark sparrow +	<i>Chondestes grammacus</i>
Black-throated sparrow *	<i>Amphispiza bilineata</i>
Lark bunting +	<i>Calamospiza melanocorys</i>
Savannah sparrow *	<i>Passerculus sandwichensis</i>
Grasshopper sparrow +	<i>Ammodramus savannarum</i>
Fox sparrow *	<i>Passerella iliaca</i>
Song sparrow +	<i>Melospiza melodia</i>
Lincoln's sparrow	<i>Melospiza lincolni</i>
Swamp sparrow *	<i>Melospiza georgiana</i>
White-throated sparrow *	<i>Zonotrichia albicollis</i>
Harris's sparrow *	<i>Zonotrichia querula</i>
White-crowned sparrow	<i>Zonotrichia leucophrys</i>
Golden-crowned sparrow	<i>Zonotrichia atricapilla</i>
Dark-eyed junco	<i>Junco hyemalis</i>
Cardinals, tanagers, and allies	
Scarlet tanager *	<i>Piranga olivacea</i>
Western tanager	<i>Piranga ludoviciana</i>
Rose-breasted grosbeak	<i>Pheucticus ludovicianus</i>
Black-headed grosbeak +	<i>Pheucticus melanocephalus</i>
Blue grosbeak +	<i>Passerina caerulea</i>
Lazuli bunting	<i>Passerina amoena</i>
Indigo bunting *	<i>Passerina cyanea</i>
Dickcissel *	<i>Spiza americana</i>
Blackbirds and orioles	
Bobolink *	<i>Dolichonyx oryzivorus</i>
Red-winged blackbird +	<i>Agelaius phoeniceus</i>
Western meadowlark +	<i>Sturnella neglecta</i>
Yellow-headed blackbird +	<i>Xanthocephalus xanthocephalus</i>
Brewer's blackbird +	<i>Euphagus cyanocephalus</i>
Common grackle +	<i>Quiscalus quiscula</i>
Great-tailed grackle *	<i>Quiscalus mexicanus</i>
Brown-headed cowbird +	<i>Molothrus ater</i>
Orchard oriole	<i>Icterus spurius</i>
Bullock's oriole +	<i>Icterus bullockii</i>
Finches	
House finch +	<i>Haemorhous mexicanus</i>
Common redpoll *	<i>Acanthis flammea</i>
Pine siskin *	<i>Spinus pinus</i>
Lesser goldfinch *	<i>Spinus psaltria</i>
American goldfinch	<i>Spinus tristis</i>
Evening grosbeak *	<i>Coccothraustes vespertinus</i>
Old world sparrows	
House sparrow (I)+	<i>Passer domesticus</i>

+ Known to nest on complex.

\* Rare or accidental sightings.

(I) Introduced.

**Table G-5. Mammals found on the Rocky Mountain Arsenal National Wildlife Refuge, 2014.**

<i>Common name</i>	<i>Scientific name</i>
Insectivores	
North American least shrew	<i>Cryptotis parva</i>
Bats	
Silver-haired bat	<i>Lasionycteris noctivagans</i>
Little brown bat	<i>Myotis lucifugus</i>
Big brown bat	<i>Eptesicus fuscus</i>
Hoary bat	<i>Lasiurus cinereus</i>
Lagomorphs	
Desert cottontail	<i>Sylvilagus audobonii</i>
Eastern cottontail	<i>Sylvilagus floridanus</i>
Black-tailed jackrabbit	<i>Lepus californicus</i>
Rodents	
Spotted ground squirrel	<i>Spermophilus spilosoma</i>
Thirteen-lined round squirrel	<i>Spermophilus tridecemlineatus</i>
Black-tailed prairie dog	<i>Cynomys ludovicianus</i>
Fox squirrel	<i>Sciurus niger</i>
Northern pocket gopher	<i>Thomomys talpoides</i>
Plains pocket gopher	<i>Geomys bursarius</i>
Plains pocket mouse	<i>Perognathus flavescens</i>
Silky pocket mouse	<i>Perognathus flavus</i>
Hispid pocket mouse	<i>Chaetodipus hispidus</i>
Ord's kangaroo rat	<i>Dipodomys ordii</i>
American beaver	<i>Castor canadensis</i>
Western harvest mouse	<i>Reithrodontomys megalotis</i>
Deer mouse	<i>Peromyscus maniculatus</i>
Northern grasshopper mouse	<i>Onychomys leucogastor</i>
House mouse	<i>Mus musculus</i>
Prairie vole	<i>Microtus ochrogaster</i>
Meadow vole	<i>Microtus pennsylvanicus</i>
Common muskrat	<i>Ondatra zibethicus</i>
Carnivores	
Red fox	<i>Vulpes vulpes</i>
Coyote	<i>Canis latrans</i>
Raccoon	<i>Procyon lotor</i>
Long-tailed weasel	<i>Mustela frenata</i>
American mink	<i>Mustela vison</i>
American badger	<i>Taxidea taxus</i>
Striped skunk	<i>Mephitis mephitis</i>
Bobcat	<i>Lynx rufus</i>
Ungulates	
Mule deer	<i>Odocoileus hemionus</i>
White-tailed deer	<i>Odocoileus virginianus</i>
Bison	<i>Bison bison</i>

