

Utah State University

DigitalCommons@USU

All U.S. Government Documents (Utah Regional
Depository)

U.S. Government Documents (Utah Regional
Depository)

1998

Rawlins RMP Biological Assessment

Bureau of Land Management

Follow this and additional works at: <https://digitalcommons.usu.edu/govdocs>



Part of the [Environmental Indicators and Impact Assessment Commons](#)

Recommended Citation

Bureau of Land Management, "Rawlins RMP Biological Assessment" (1998). *All U.S. Government Documents (Utah Regional Depository)*. Paper 468.

<https://digitalcommons.usu.edu/govdocs/468>

This Report is brought to you for free and open access by the U.S. Government Documents (Utah Regional Depository) at DigitalCommons@USU. It has been accepted for inclusion in All U.S. Government Documents (Utah Regional Depository) by an authorized administrator of DigitalCommons@USU. For more information, please contact digitalcommons@usu.edu.



RAWLINS RMP BIOLOGICAL ASSESSMENT

INTRODUCTION

This Biological Assessment (BA) is prepared for the Draft Environmental Impact Statement (DEIS) that describes the comprehensive analysis of alternatives for the planning and management of public lands and resources administered by the Bureau of Land Management (BLM) in the Rawlins area of Wyoming. The public lands and federal mineral estate within the RFO Resource Management Planning Area (RMPPA) are the subject of the planning effort (DEIS) and this document. This document is a component of the BLM Draft Environmental Impact Statement Resource Management Plan (RMP) and is prepared in compliance with the National Environmental Policy Act (NEPA) which requires that an environmental impact statement be prepared for any federal actions that may significantly affect the human environment. The preparation and adoption of a RMP by the BLM is such a Federal action.

Under provisions of the federal Endangered Species Act of 1973, as amended (ESA) (16 U.S.C. Section 1531 et seq.), federal agencies are directed to conserve threatened and endangered species (T&E) and the habitats in which these species are found. Section 7 (c) of the ESA requires the BLM RFO to complete a BA to determine the effects of implementing the DEIS RMP on listed and proposed species, based on compliance with Section 102 of NEPA. Federal agencies are required to consider, avoid, or prevent adverse impacts to fish and wildlife species. Federal agencies are also required to ensure actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of endangered and threatened species or their critical habitat. The ESA requires action agencies, such as the Bureau of Land Management (BLM), to consult or confer with the U.S. Fish and Wildlife Service (USFWS) when there is discretionary federal involvement or control over the action and to ensure resources are afforded adequate consideration and protection. Formal consultation becomes necessary when the action agency requests consultation after determining the proposed action is likely to adversely affect listed species or critical habitat, or the aforementioned federal agencies do not concur with the action agency's finding (USFWS, Consultation Handbook, 1998). In addition, under the 1994 Memorandum of Understanding (MOU) and the 2000 Memorandum of Agreement (MOA) among the BLM, U.S. Forest Service (USFS), USFWS, and NMFS, all four agencies agreed to promote the conservation of candidate and proposed species (Special Status) and streamline the Section 7 consultation and coordination process.

The objective of this programmatic biological assessment is to provide documentation and analysis for the proposed action to meet the federal requirements and agreements set forth among the federal agencies. It addresses federally listed threatened and endangered, candidate, and proposed species and has been prepared under the 1973 ESA Section 7 regulations, in accordance with the 1998 procedures set forth by USFWS and NMFS, and in accordance with the 1994 and 2000 MOU and MOA, respectively. The RFO and contractor wildlife biologists, in coordination with the USFWS wildlife biologist, conducted an analysis regarding the effects of the DEIS preferred alternative on listed species. Site-specific evaluations will be conducted for activities authorized under the RMP and consultation or conference would occur with the USFWS for those activities that may affect threatened, endangered, candidate or proposed species. In addition, BLM would evaluate site-specific activities that may affect BLM Wyoming Sensitive Species (Sensitive Species), in compliance with BLM Manual 6840. This BA will not address Sensitive Species; these are addressed in the DEIS.

As part of this biological assessment, BLM requests formal consultation for proposed actions that will lead to water depletion (consumption) in the Platte and/or Colorado River systems. This consultation is required for the four federally listed species of fish in the upper Colorado River system: the endangered Colorado pikeminnow (*Ptychocheilus lucius*), the endangered humpback chub (*Gila cypha*), the

endangered bonytail chub (*Gila elegans*), the endangered razorback sucker (*Xyrauchen texanus*) and their designated critical habitat; and six federally listed species in the Platte River system: the endangered whooping crane (*Grus americana*) and its designated critical habitat, endangered interior least tern (*Sterna antillarum*), threatened piping plover (*Charadrius melodus*) and its designated critical habitat, endangered pallid sturgeon (*Scaphirhynchus albus*), endangered Eskimo curlew (*Numenius borealis*), and the threatened Western prairie fringed orchid (*Platanthera praeclara*).

In addition formal consultation and conferencing is requested for the federally listed endangered black-footed ferret (*Mustela nigripes*), threatened Preble's meadow jumping mouse (*Zapus hudsonius preblei*) and its designated critical habitat, threatened Canada lynx (*Lynx canadensis*), threatened bald eagle (*Haliaeetus leucocephalus*), endangered Wyoming toad (*Bufo baxteri*), threatened Ute ladies'-tresses plant (*Spiranthes diluvialis*), threatened Colorado butterfly plant (*Guara neomexicana ssp. coloradensis*) and its designated critical habitat, and the endangered blowout penstemon plant (*Penstemon haydenii*).

BLM also requests recommendations from the USFWS on the management of habitat for the candidate western populations of yellow-billed cuckoo (*Coccyzus americanus*), and the candidate western boreal toad (*Bufo boreas boreas*). These species are candidates for listing as threatened or endangered and may occur within the RMPPA. The BLM has the requirement under BLM Manual 6840 to protect candidate species from further population declines.

DESCRIPTION OF THE PROPOSED ACTION

The BLM Rawlins Field Office (RFO) administrative area is located in south central Wyoming and includes approximately 11.2 million acres of land in Albany, Carbon, Laramie, and Sweetwater Counties. Within this area, the RFO administers approximately 3.4 million acres of public land surface and mineral estate, 0.1 million acres of public land surface where the mineral estate is state and private, and 1.2 million acres of federal mineral estate where the surface is privately owned or state owned. As stated above, the public lands and federal mineral estate within the RMPPA are the subject of the planning effort (BLM RMP) and actions that would occur, and associated potential and/or known impacts that would result, as a result of implementing the BLM RMP, are the subject of this BA document.

The Record of Decision (ROD) for the existing Great Divide RMP (the predecessor to the RFO RMP) was signed by the Wyoming BLM State Director on November 8, 1990. The Great Divide RMP provides guidance and direction for management of BLM-administered public land surface and federal mineral estate. The RMP is a set of comprehensive long-range decisions concerning the use and management of resources administered by the BLM and (1) provides an overview of goals, objectives, and needs associated with public lands management, and (2) resolves multiple-use conflicts or issues. On July 5, 2001, an evaluation of the Great Divide RMP was completed. The evaluation found the RMP to be deficient in several areas as a result of changing conditions and demands on the area's resources. As a result of these findings, the RFO has decided that the Great Divide RMP requires modification. The name of the newly revised RMP will be changed to the RFO RMP.

The objective of the RFO RMP is to provide specific management direction to prevent or address potential conflicts among energy resources development, recreational activities, livestock management, important wildlife habitat, and other important land and resource uses in the planning area, as well as determine the appropriate levels and timing of these activities. Decisions made as a result of the Record of Decision for this RFO RMP will result in amending the existing Great Divide RMP (November 1990).

The following discussion is a general qualitative overview/summarization of the RFO RMP activity programs and potentially authorized activities of the BLM that may affect endangered, threatened, proposed, and candidate species now or in the foreseeable future. Manpower and budgetary restrictions,

and changes in biological and technological information, may affect the extent to which RFO may engage in the following program activities. Therefore, the likelihood of these potentially authorized activities to occur is largely undeterminable at this scale over the life of the plan. Site specific analysis and determinations of Section 7 consultations, where appropriate, will be conducted on a case-by-case basis throughout the life of the plan.

Air Quality—The BLM’s Air Quality program consists of monitoring efforts in cooperation with the USFS, the Wyoming Department of Environmental Quality (DEQ) and the U.S. Environmental Protection Agency (EPA) and evaluating and restricting surface development. Monitoring for air quality components (i.e., carbon monoxide, nitrogen dioxide, sulfur dioxide, ozone, particulate matter, visibility, and atmospheric deposition) is conducted from various facilities around Wyoming.

Regional haze regulations, developed by the U.S. Environmental Protection Agency (EPA), require the BLM to measure the distance one can distinguish a dark landscape feature. Haze causing pollutants (mostly fine particles) are directly emitted to the atmosphere or are formed when gases emitted to the air form particles as they are carried downward. During air management activities, the Bureau applies dust control measures, obtains permits from DEQ, and collects meteorological and/or air quality data. While restricting surface development activities, the Bureau ensures that operators cover conveyors at mine sites, restrict flaring of natural gas, limit emissions, and restrict spacing on projects.

Air quality management objectives are to maintain or enhance air quality and minimize emissions that could result in atmospheric deposition (acid rain), violations of air quality standards, or reduced visibility. Laws controlling air pollutants in the United States are the Clean Air Act of 1970 and its amendments and the 1999 Regional Haze Regulations. The concentrations of air contaminants in the planning area need to be within limits of Wyoming ambient air quality standards (WAAQS) and national ambient air quality standards (NAAQS). Both WAAQS and NAAQS are legally enforceable standards for particulate matter (PM₁₀), nitrogen dioxide (NO₂), ozone, sulfur dioxide (SO₂), and carbon monoxide (CO).

In addition to NAAQS and WAAQS, major new sources of pollutants or modifications to sources must comply with the New Source Performance Standards and Prevention of Significant Deterioration (PSD). The PSD increments measure PM₁₀, SO₂, and NO₂. The PSD program is used to measure air quality to ensure that areas with clean air do not significantly deteriorate, while maintaining a margin for industrial growth.

Cultural Resources—The BLM performs a variety of activities to preserve, protect, and restore cultural and historical resources. During inventory activities, the BLM inventories, categorizes, and preserves cultural resources, conducts field activities, performs excavations, maps and collects surface materials, researches records, and photographs sites and cultural resources. Temporary campsites may be authorized for these activities. Inventory data collection activities are used for documentation and development of mitigation plans prior to other resource program surface disturbing activities. Inventory activities commonly entail the use of hand tools. Data recovery activities occasionally entail the use of power tools and heavy equipment. The BLM’s cultural resource land management activities involve managing sites for scientific, public, and socio-cultural use; developing interpretive sites; restricting certain land uses; closing certain areas to exploration; prohibiting some surface disturbing activities; and preparing interpretive materials. The BLM also seeks listing of eligible sites on the National Register of Historic Places, installs protective fencing of trail segments and other cultural resources, stabilizes deteriorating buildings and resources, acquires access to sites when necessary, performs data recovery excavations, pursues withdrawal of areas from exploration and development of locatable minerals, designates avoidance areas, pursues cooperative agreements, and identifies and interprets historic trails.

The BLM performs cultural resource inventories normally in response to other surface disturbance activities. Inventories include transects set 30 meters (100 feet) apart from each other.

Fire and Fuels Management—The two major categories of activities involved with the BLM’s fire management program are fuels treatments (including biological, chemical, prescribed burning and mechanical treatments) and wildland fire suppression. During fuels treatment activities, the BLM evaluates areas on a case-by-case basis, writes activity plans, which encompass any of the above, listed treatments, coordinates with all necessary parties and conducts treatment projects. Fuels treatments are used to enhance natural resources in the area. Fuel treatments can be used to dispose of slash and residue from timber sales. Fuels treatments are sometimes used to reduce the fuel levels before a treatment activity. Most fuels treatments are conducted to improve wildlife habitat and rangeland health.

Wildland fire suppression activities on the other hand are done on an emergency basis. Preplanning for wildland fire suppression takes place in many forms before a fire may occur. Wildland fire suppression activities vary with intensity of the wildfire and can involve the use of off-road vehicles, hand tools, aviation resources and heavy equipment such as bulldozers. Fire lines are constructed to contain the wildland fire. Chemical fire suppression agents (ground based) containing surfactant compounds, ammonium nitrate compounds, and chemical dyes may be used if needed. In addition, fire retardant drops containing chemical dyes (aircraft dispersal) are used. These may affect the aquatic environment if used where the chemicals may enter the streams. Water is withdrawn from nearby sources to suppress the fire. Nearby sources may include streams, lakes, or public water supplies. After the fire is extinguished, the BLM may use rehabilitation techniques to stabilize disturbed or burned area. Rehabilitation techniques may involve planting small trees, grass, forbs, and shrubs to bring the site back to its original vegetative state.

Through wildland fire suppression activities the BLM seeks to effectively protect life, property, and resource values from wildfire. The BLM uses fire suppression on fires endangering human life or fires that come within 1 mile of state or private lands, structures and facilities. Acres of wildland fire fluctuate annually. Recent trends throughout the Wyoming BLM are similar to trends throughout the west, with larger, catastrophic fires in recent years due to drought conditions and past fire suppression policies.

Forest Management—The BLM’s Forestry Program activities involve a variety of different activities. Most activities involve timber harvesting. Other activities involve managing the forest for other uses. During forest management activities for timber production in the pre-harvest phase, trees are cut and removed or treated if diseased. Permits are issued for pre-commercial thinning, chaining, and shearing. Harvesting activities include clearcuts, selective cutting, slash disposal, and commercial thinning, helicopter/traditional logging, and skidder-type yarding as well as cable yarding. Harvesting also includes the construction of roads and landings. Slash is lopped and scattered, roller chopped, or burned. Non-commercial timber harvest involves collection and cutting of firewood, Christmas trees, posts, poles, and wildlings. During restoration efforts following timber harvesting, the Bureau ensures site regeneration (natural), artificial regeneration (planting harvested areas, including new seedlings), and stand replacements; fences regenerated areas; and conducts rehabilitation surveys.

Lands and Realty—The lands and realty management program seeks to support multiple-use management goals of the BLM resource programs; respond to public requests for land use authorizations, sales, and exchanges; and acquires and designates rights-of-way access to serve administrative and public needs.

Rights-of-way granted by the BLM are utilized for access roads, well pads, pipelines, communication sites, ditches and canals, buried telephone lines and fiber optic lines, reservoirs, compressor stations and other facilities, and electrical distribution lines (powerlines) associated with proposed projects and/or

activities. In addition, the BLM authorizes rights-of-way and leases for utility transportation corridors. A rights-of-way is generally issued for a term of 30 years and may be extended with the right of renewal.

Land tenure adjustment requests such as disposals of or transfers of public lands through Desert Land Entry, sale, exchange, state of Wyoming indemnity selection, or Recreation and Public Purposes (R&PP) leases or patents are also reviewed.

In its Lands and Realty Management program, the BLM implements or authorizes these programs that may or may not require stipulations and protective measures. These activities include, but are limited to, designating, canceling, or changing stock driveways, processing locatable mineral entry withdrawals; and establishing protective withdrawals.

In addition, the BLM also pursues cooperative agreements; develops recreation site facilities; considers offsite mitigation; minimizes access in wildlife habitat; fences revegetation sites; blocks linear rights of way to vehicle use; considers temporary use permits (less than three years, e.g., rig stacking, commercial filming and photography permits); considers new withdrawals; leases acres for landfills; acquires conservation easements; closes roads; and rehabilitates areas.

Withdrawals are used to preserve sensitive environmental values, protect major federal investments in facilities, support national security, and provide for public health and safety. They segregate a portion of public lands and suspend certain operations of the public land laws, such as desert land entries or mining claims. Land withdrawals can be used to transfer jurisdiction to other Federal land-managing agencies.

In addition, the Lands and Realty program authorizes wind energy development. Wind energy development projects are considered on a case-by-case basis. Wind turbines authorized by BLM are typically up to 180 feet in height with an 80-foot turbine diameter. Each turbine would encompass approximately 1.2 acres. Ancillary uses would include meteorological towers, roads and powerlines.

Livestock Management—A number of activities make up the BLM's livestock management program. These activities include livestock grazing management, vegetation treatments, and range improvements.

Livestock management includes authorizing livestock grazing; designing and implementing grazing systems; converting types of livestock; abolishing stock trails and driveways; and adjusting season of use, distribution, kind, class, and number of livestock. Vegetation treatments for livestock management include the use of prescribed fire; chemical, mechanical and biological treatments; and noxious and invasive weed control and are discussed under the Vegetation Management Section of this BA. Other activities for livestock management include supplemental feeding and herding of livestock. Range improvements include fence construction, maintenance, and modification (including enclosures and cattle guards), water developments (reservoirs, seeps, springs, pipelines, catchments, and wells), and instream structures.

Minerals—The BLM's mineral development program is divided into 3 categories. These categories are salable minerals, leasable minerals, and locatable minerals.

Common Variety Minerals—Common variety mineral mining is authorized under the Materials Act of 1947, as amended, and as such are discretionary actions. Common variety minerals include sand, gravel, sandstone, shale, limestone, dolomite, and any material considered a common variety. Historical use of these materials was for building materials, road surfaces, and decorative stone. Today, common variety minerals are mainly used for maintaining roads and activities associated with the oil and gas industry. The BLM provides sand, gravel, and stone from federal mineral deposits as necessary to meet the need

for federal, state, and local road construction and maintenance projects in the planning area. These materials may be saleable, or available by a free use permit to state and local governments.

Before issuing contracts or free use permits for common variety minerals, the BLM conducts appropriate environmental assessments. These include special studies or inventories of cultural values, threatened or endangered plant and wildlife species, or other resources. Stipulations or conditions may be included in the terms of the contract to ensure protection of the natural resource found there and reclamation of the land following project completion. Site reclamation is required following any surface disturbing mining activity for common variety minerals. Reclamation of disturbed sites is important to be sure that the land can later be used productively for other purposes. Reclamation includes removing all man-made debris, recontouring, reducing steep slopes, replacing topsoil, and seeding and planting vegetation. All reclamation proposals must conform to State requirements and must be approved by the BLM.

Leasable Minerals—Leasable minerals include solid minerals such as coal, and fluid minerals such as oil, gas and coalbed methane gas.

Leasable Minerals (Solid)—There are six significant coalfields within the RMPPA containing coal resources of sub-bituminous to bituminous rank. These fields include the Hanna-Carbon Basin, Great Divide Basin, Rock Creek, Kindt Basin, Little Snake River, and Goshen Hole Coalfields. Of these, the Hanna Field has been the most significant in terms of historic, and projected, coal production. In 2000, the Hanna Field had three active coal mines (two surface and one underground mine); as of mid-2002, there are two mines that are still active (Seminole No. II mine and Medicine Bow mine). These existing mines are expected to remain in operation for less than two years.

Most activity in the remaining fields has typically been of small scale, and in some cases the coal resource has yet to be economically exploited. Federal coal has been recovered using strip mines (27 million tons) and extracted using underground mining methods (16 million tons).

Leasable Minerals (Fluid)—The Mineral Leasing Act of 1920 provides that all public lands are open to oil and gas leasing unless specifically designated by public law (43 CFR 3100.0-3). To acquire a lease, acreage is nominated by the public to be included in an oil and gas lease sale. This acreage is subdivided into parcels and sent to the appropriate BLM field office. The field office reviews the parcel for potential conflicts with other resources and appropriate stipulations for protection of wildlife and other sensitive resources are included in the lease language.

Mineral exploration involves opening new areas to geophysical exploration, leasing and potentially drilling for oil, gas, coal bed methane and other leasable minerals. Mineral development involves an expansion of the exploration phase with construction and initial reclamation of well pads, access roads, reserve pits, windpower associated with leases, and other facilities that may include above ground powerlines and buried pipelines. Stipulations included in the lease language allow protection by controlled surface use (CSU) restrictions or no surface occupancy (NSO) restrictions if the resource requires these measures. Partial reclamation is required during the production phase and full restoration is required after the project is abandoned.

Before seismic activity begins, a Notice of Intent (NOI), which details the location, type of activity, and a cultural inventory, must be filed in the appropriate BLM field office. The BLM conducts an in-office environmental analysis to determine if any threatened or endangered species will be affected. Recent seismic activity in this area has been 3-D surveys, although 2-D surveys are occasionally conducted.

Prior to drilling activities, an application for permit to drill (APD) and a site specific Environmental Assessment (EA) must be approved. APDs subject to site-specific conditions of approval may be more or

less restrictive than lease stipulations. Drilling and producing operations are inspected regularly to insure that conditions of approval are followed. Activities that would occur as a result of authorizing APDs include the application of dust control measures; the restriction of flaring of natural gas; the control of light emissions; and the construction of reservoirs associated with water disposal, compressor stations, product enhancement facilities, and disposal facilities.

Construction and operation of drill sites could result in limited commitment of certain resources. After the subsurface resource is produced and the drill site reclaimed, the surface resource is reestablished to a condition that may be better than the original. Site-specific commitment of resources includes the removal of vegetation and commitment of land surface to roads and well pads during the time that the subsurface resource is being recovered.

When split estate situations occur, wildlife restrictions for T&E and Special Status species are applied to both the sub-surface estate and to the surface activities because of the federal nexus of the actions. In this case, for example, federal minerals underlie a non-federal surface and T&E and Special Status species are protected with wildlife restrictions. Wildlife stipulations for other species not associated with the T&E program would not apply when a split estate situation occurs (federal minerals/non-federal surface) and a proposed project is analyzed.

The BLM develops and implements surface disturbance restrictions by incorporation of conditions of approval in the site-specific analysis. These restrictions vary depending on the type of resource to be protected. Some examples of restrictions include no surface occupancy on floodplains, wetlands and riparian zones and spatial/timing restrictions adjacent to greater sage-grouse leks and raptor nests.

Locatable Minerals—All public lands are also open to exploration for locatable minerals except those withdrawn to protect other resource values and uses or those lands with acquired mineral status. The BLM has management authority over mining claim operations for locatable minerals conducted under the General Mining Law of 1872. These operations are managed using the surface regulations in 43 CFR 3809. Activity authorized under the General Mining Law, is not subject to many of the special stipulations that are used in the common variety and leasable mineral programs to protect sensitive resources from surface disturbance caused by mineral development. However, they are subject to ESA, NHPA, and all applicable state requirements.

Bentonite, uranium, and gypsum are the principle locatable minerals of Wyoming BLM. Other locatable metallic minerals include silver, gold, platinum, cobalt, and other precious minerals. At this time, no active metallic mineral mining occurs on BLM managed public lands except for occasional recreational panning in the planning area.

Actions associated with commercial locatable minerals may include surface disturbance for mining (including exploration and development), reclamation, and construction of access roads, buildings, and utility lines. Small-scale mining must be approved by a plan of operations and will require either an EA or an EIS. All lands must be reclaimed after expiration of mining.

Off-Highway Vehicle—The BLM implements management in areas designated as closed, limited, or open to Off-Highway Vehicle (OHV) use. The BLM posts signs, develops maps, or brochures, and monitors OHV use. OHV use on BLM administered lands is limited to existing roads and trails. Over-the-snow vehicles (snowmobiles) are allowed to go cross-country. By the year 2008, OHV use will be limited to designated roads and trails except for those areas identified as open or closed to OHV use in areas larger than one section. The Ferris Mountains, Encampment River, Bennett Mountains and Prospect Mountain WSAs are closed to OHV use. Seasonal closures may be applied in crucial wildlife

habitats as needed, including over-the-snow use. In addition OHVs are prohibited when their use will cause resource damage. The BLM permits OHV events.

The BLM recognizes the use of bicycles and other human-powered, mechanized conveyances as appropriate recreational activities. Federal regulations do not specifically address management of non-motorized vehicle use. The Wyoming state BLM has adopted the national OHV strategy to meet local needs. Bicycles will be allowed on the Encampment River Trail within the WSA, until such time it is designated by Congress as a wilderness area. Wheelchairs will be allowed despite designation of use.

Paleontological Resources—The BLM performs a variety of activities to preserve, protect, and restore paleontological resources. During inventory activities, the BLM inventories, categorizes, and preserves paleontological resources, conducts field activities, performs excavations, maps and collects surface materials, researches records, and photographs sites and paleontological resources. Inventory data collection activities are used for documentation and development of mitigation plans prior to other resource program surface disturbing activities. Inventory activities commonly entail the use of hand tools, power tools, or heavy machinery. The BLM's paleontological resource land management activities involve managing sites for scientific, and public use; developing interpretive sites; restricting certain land uses; closing certain areas to exploration; prohibiting some surface disturbing activities; stabilizing erosion (e.g., bury exposed sites); preparing interpretive materials; and allowing the collection of certain invertebrate fossils. The BLM pursues withdrawal of areas from exploration and development of locatable minerals, designates avoidance areas, pursues cooperative agreements, and identifies and interprets paleontological sites.

Hazardous Materials Management—The BLM's Hazardous Materials Management program provides warnings; secures and disposes of hazardous waste discharged on public lands; reports, secures, and cleans up public lands contaminated with hazardous wastes; uses precautionary measures; establishes precautions; responds to emergencies.

The Hazardous Materials Management program and activities seeks to protect public and environmental health and safety on BLM-administered public lands, comply with federal and state laws, prevent waste contamination due to any BLM-authorized actions, minimize federal exposure to the liabilities associated with waste management on public lands, and integrate hazardous materials and waste management policies and controls into all BLM programs. Hazardous waste sources may be from illegal dumping, abandoned waste and mine tailings.

Recreation—Recreation management activities include allowing and improving recreational access, building and maintaining developed recreation sites, developing recreation trails, ensuring public safety, protecting the resources, and assessing recreation use on the environment. Recreational activities on BLM lands include hiking, hunting, mountain biking, floating, fishing, OHV use (including snowmobiles), horseback riding, backpacking, rock hounding, and camping. Large recreational events may be issued Special Recreation Permits. The BLM authorizes commercial recreation uses.

Recreation site development includes facilities for camping, fishing and floating, and associated signing, road development, and maintenance (both developed and undeveloped recreation sites), and develops public water sources for recreation facilities.

Recreation program management includes monitoring OHV use and high use areas, and contacting visitors in the field. The BLM places signs, identifies hazards, constructs and uses roads for recreation activities, restricts recreational uses where adverse impacts have occurred, and conducts inventories of recreation resources. The recreation program monitors recreational use, develops management plans, and evaluates recreational potential for future planning and development.

There is the potential for recreational activities to occur year-round in most of the planning area, though some parcels would receive minimal use during the winter due to poor access and adverse weather conditions. The numbers of individuals that participate in outdoor recreational activity has been increasing steadily and, except for hunting, this trend is expected to continue. Visitor use is highest during the summer months.

Special Management Areas—Under the Special Areas Management program, the Bureau closes areas where accelerated erosion is occurring; implements logging and heavy equipment use restrictions; evaluates weed and pest control measures; applies restrictions on ground-disturbing activities; develops recreational trails; guides supervised tours; protects petroglyphs, artifacts, and cultural deposits from weathering and vandalism; and pursues land exchanges. The objectives of special management areas are to ensure continued public use and enjoyment of recreation activities, while protecting and enhancing natural and cultural values; improving opportunities for high quality outdoor recreation; and, improving visitor services related to safety, information, interpretation, and facility development and maintenance. Special Management Areas within the RMPPA include the Sand Hills ACEC/Proposed JO Ranch Expansion, the Jep Canyon Wildlife Habitat Management Area, the Shamrock Hills Wildlife Habitat Management Area, the Laramie Plains Lakes Wildlife Habitat Management Area, the Blowout Penstemon ACEC, the Continental Divide National Scenic Trail SRMA, and the North Platte River SRMA.

Wild and Scenic Rivers Management—The BLM, under the Wild and Scenic Rivers Act, studied segments of streams throughout the RFO to determine their eligibility and suitability for designation as Wild and Scenic Rivers. The Encampment River reach within the Encampment River WSA was found to be eligible and suitable for WSR designation. BLM manages that segment to retain the wild and scenic values until Congress considers the rivers for possible designation as Wild and Scenic Rivers.

Wilderness Management—The purpose of the interim policy for Wilderness Study Areas is to retain their suitability for Congressional designation as Wilderness. Discretionary uses within or adjacent to Wilderness Study Areas are reviewed to ensure that they do not impair wilderness values. The Adobe Town WSA, Ferris Mountains WSA, Prospect Mountain WSA, Encampment River Canyon WSA, and Bennett Mountains WSA are all located within the RMPPA.

Transportation and Access Management—The Transportation and Access Management activities are generally in support of other resource management programs. Effects due to access are discussed in activities sections and are summarized below.

The Bureau rehabilitates access roads no longer needed; proposes access easement acquisitions; and pursues legal access across private and state lands.

Vegetation Management—Vegetation objectives for the BLM are to maintain or improve the diversity of plant communities to support multiple uses such as livestock grazing, wildlife habitat, timber production, watershed protection, visual resources, the reduction in the spread of noxious and invasive weeds, and the protection of important habitats for special status plants species. Projects that may affect T/E plants or animals will be postponed or modified to protect the presence of these species and consultation with the USFWS will be initiated.

As part of the vegetation management program, the BLM conducts prescribed burns, as well as spraying, light and heavy mechanical treatments; uses species-specific insects and livestock grazing; implements weed and pest control programs, and plants vegetation. Light mechanical control includes cutting and thinning with hand tools. Heavy mechanical control includes brush beating, cutting, and thinning with machinery.

Noxious and invasive weeds are located within the RFO. Noxious weeds are listed by the state, whereas invasive weed species are listed by the BLM (see glossary of RMP). The three types of noxious or invasive weed control measures used by the BLM on public lands are chemical, biological, and mechanical. Weed control is done in cooperation with Carbon, Sweetwater, Laramie, and Albany County Weed and Pest Districts, permittees, grantors, lessees, and private landowners. Only federally approved pesticides and biological controls are utilized and all label directions are followed. If herbicides are proposed for use, minimum toxicity herbicides will be used with appropriate buffer zones along streams, rivers, lakes, and riparian areas, including those along ephemeral and intermittent streams.

Chemical controls include growth regulators, contact herbicides, and inhibitors. The majority of rangeland applications are applied with backpack sprayers; other treatments are applied using aircraft. Chemical treatments to rights-of-way and oil and gas related facilities are applied using vehicle mounted sprayers and aircraft. Biological controls include using microbotic organisms (fungus and rusts) and insects (beetles, midges and wasps) and are applied by hand. Ungulates (goats and livestock) used to control weeds are herded. Mechanical control is normally done through hand pulling and digging which is not as intrusive as mowing or other machine use.

Sensitive Plants Management—The actions identified above and associated with this program deal with the management and enhancement of identified populations of sensitive plant species and/or unique plant communities.

Visual Resources Management—Through Visual Resource Management (VRM), the BLM maintains or improves scenic values and visual quality, and establishes visual resource management priorities in conjunction with other resource values.

A visual resource inventory and classification process is a qualitative analysis performed through out the resource area. A visual resource inventory provides 1) an inventory tool that portrays the relative visual quality of a landscape, and 2) a management tool that delineates visual protection standards by which surface disturbing activities may occur and establishes guidelines for the rehabilitation of existing projects, facilities and disturbances. The BLM-lands in the planning area were classified as Class I in the WSAs and Class II in areas adjacent to the Ferris Mountain and Adobe Town WSAs, much of the forest fringe, Seminoe and Pathfinder Reservoirs north of the ‘checkerboard’ area, and Class IV in heavily industrialized and coal bearing areas, and the remainder of the field office is Class III.

Effectively, Class I areas prohibit surface disturbances, because they are in Wilderness Study Areas. Class I areas preserve the existing character of the landscape; provides for natural ecological changes only; does not preclude very limited management activity; level of change to the characteristic landscape should be extremely low and must not attract attention; and includes primitive areas, wilderness study areas, some natural areas, some wild and scenic rivers and other similar areas where landscape modification activities should be restricted.

To retain the characteristics of a Class II rating, management actions or authorizations could occur only if they are properly mitigated. These mitigations must prevent development from attracting the attention of the casual observer. They must adhere to the following limits: retain the existing character of the landscape; the level of change to the characteristic landscape should be low; management activities may be seen but should not attract the attention of the casual observer; and, any changes should repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape and if a proposal can not be adequately mitigated to retain the character of the landscape, then modifications to the proposal would be required.

Class III areas partially retain the existing character of the landscape, are areas where changes in the basic elements (form, line, color, or texture) caused by a management activity should not dominate the view of the casual observer, and where changes should remain subordinate to the visual strength of the existing character.

Class IV areas are areas where management activities may dominate the view and be the major focus of viewer attention and areas where changes may subordinate the original composition and character; however, they should reflect what could be a natural occurrence within the characteristic landscape.

Water Quality, Watershed and Soils Management—The BLM performs a variety of activities designed to preserve and protect soil, water, and watershed quality. Some of these activities are implementation of watershed plans, identification of heavy sediment loads, monitoring and minimizing soil erosion, evaluating and restricting surface development activities, and monitoring water quality. These activities at times involve field activities and the use of heavy equipment and hand tools.

The BLM Watershed Management activities include evaluating proposed projects, applying soil management practices, applying seasonal closures, monitoring public drinking water, and completing ground water studies. Some of these field activities involve the use of heavy machinery and hand tools. Field activities can involve developing riparian/wetland exclosures; constructing stream crossings that allow for appropriate sediment and flow passage; practice stream improvement practices such as increasing sinuosity in channels by using hand tools to construct natural structures which include rock or other natural materials; construct artificial in-stream structures using heavy equipment, steel, geo-textile fabrics, and other materials; cutting, planting, and seeding to restore function in riparian/wetland areas; implementing pitting; and maintaining water-spreader dikes. Other activities can involve imposing restrictions on activities such as mineral exploration and development, pipelines, powerlines, roads, recreation sites, fences, and wells.

Activities associated with soil resources may also include reclamation of abandoned mines and open shafts, removal of waste rock in floodplains or streams, or cleanup of tailings. Soil sampling and surface soil erosion studies may also be conducted. These soil resource related activities in the planning area are mainly in support of other programs.

Through water resource management the BLM seeks to maintain or improve surface and groundwater quality consistent with existing and anticipated uses and applicable state and federal water quality standards, provide for the availability of water to facilitate authorized uses, and to minimize harmful consequences of erosion and surface runoff. Water resources are also to be protected or enhanced through site-specific mitigation guidelines.

During watershed management activities, the BLM develops pollution prevention plans; ensures rights to water-related projects are filed; delineates no chemical use buffer zones; designs activities to promote reduction of channel erosion; restricts surface disturbance near water sources and sensitive soils; and improves, maintains, and restores damaged wetlands or riparian areas by restoring hydrologic function. The BLM also provides technical expertise on other activities such as livestock ponds, waterfowl monitoring activities, and provides impact analyses of oil and gas development or any surface disturbance projects. The BLM provides technical expertise in reestablishing floodplains, iron mines, and contoured railroad grades.

The BLM prohibits surface discharge of produced water in the Colorado River Basin. Surface disturbance is limited in the Encampment River watershed and new permanent structures are prohibited.

Wildlife and Fisheries Management—Through wildlife and fisheries habitat management the BLM maintains and enhances habitat for a diversity of wildlife and fish species and provides habitat for threatened, endangered, candidate, proposed, and special status animal and plant species in compliance with the ESA, BLM Manual 6840, and approved recovery plans. The BLM wildlife habitat management program supports population objective levels in the WGFD strategic plan.

Wildlife program activities may include inventory and monitoring, habitat improvement projects, developing stipulations and protective measures, and predator control in coordination with APHIS. Inventory and monitoring includes habitat assessments and species surveys and is used to assess the effectiveness of the implementation of timing stipulations, reducing conflicts between species and other activities, and appropriate mitigation. In addition, inventory and monitoring are used to identify and describe habitat requirements and life history characteristics of T&E and Special Status species.

The wildlife program supports other resources including fire and fuels; forestry; minerals including leasable, locatable, and common variety mineral exploration; recreation; cultural and paleontological; lands and realty; and wild horse programs activities.

Habitat improvement projects include, but are not limited to, the development of water sources, construction and maintenance of fences, the management of other resource activities to conserve forage and protect habitat, the improvement of forage production and quality of rangelands; and vegetative treatments (prescribed fires, mechanical, chemical, biological treatments, cutting, thinning, planting, seeding, and pitting). Other wildlife management activities include, but are not limited to, introducing species, developing islands, modifying existing projects, constructing artificial structures; constructing guzzlers; implementing road closures (permanent and seasonal); constructing exclosures; using heavy equipment and hand tools; and closing areas to leasable, locatable, and common variety minerals for the protection of wildlife species.

In addition, other wildlife management activities include, but are not limited to, improving fisheries and wildlife habitat; documenting resource damage; implementing stream improvement practices; chemically controlling non-native fish; using electro-shocking for sampling fish communities and population studies; construction of instream barriers to protect species from non-native invaders; installation of revetments and fish passage structures, log over-pours, and gabion baskets; cabling of junipers; placement of large boulders for instream fish habitat; and restoring streams to a state of dynamic equilibrium by utilizing restoration techniques.

Wild Horse Management—The BLM Wild Horse Management Program uses herding, corralling, transporting, monitoring, and roundups for wild horse management. Land Use Plans (LUP) guide the management of wild horses. In LUP, the Bureau uses monitoring data to determine Appropriate Management Level. The Bureau manages wild horse populations to maintain viable herds. Considerations include how many AUMs the range can support, trends in utilization, and public input. The Bureau wild horse management specialists coordinate with wildlife biologists and archaeologists to reduce and/or eliminate impacts to wildlife resources. The Bureau constructs and uses short-term temporary facilities (traps and holding facilities) and long-term permanent facilities (corrals, boundary fences, and water development). There are gatherings of wild horses that use helicopters, and wranglers to round up the wild horses. Traps consist of wings (50-60 steel posts) that funnel down to portable corrals, 60x30 feet (18.3x9.15 m) in size.

Coordination / Conservation Measures

As part of the affected environment for the RFO RMP, Section 7(a)(1) of ESA requires the federal agency (i.e., BLM) to utilize all of its authorities in furthering the purposes of the Act by implementing programs

for the conservation of listed threatened and endangered species. To meet the requirements of Section 7(a)(1), the BLM needs to consider conservation programs for the management of listed threatened and endangered species separate from any consultation requirements for actions affecting other special status species (candidate and proposed species). Those conservation programs that are adopted need to be incorporated into the approved RMP. These actions would be implemented at a large scale and/or at a project-specific level.

Conservation measures serve several purposes. They can: 1) present ways the BLM can assist species conservation in furtherance of statutory responsibilities; 2) minimize or avoid the adverse impacts of a proposed action on a T&E or Special Status species; and 3) identify and recommend studies aimed at improving the understanding of a species biology or ecology.

Listed threatened and endangered, and special status species management can be addressed in four primary ways:

- (1) Through Conservation Actions identified as part of a species listing package, as Reasonable and Prudent measures recommended in the BO from the USFWS in response to a BA, and through species protection measures determined through collaborative interagency and multidiscipline efforts.
- (2) The BLM-WY Field Offices incorporate the “WY BLM Mitigation Guidelines for Surface-Disturbing and Disruptive Activities”. These guidelines (Appendix 1) of the DEIS RMP) state prior to conducting activities in known or suspected critical or essential habitat, the BLM will require inventories or studies in accordance with the BLM and/or USFWS guidelines to verify the presence or absence of T&E and Special Status species. In the event the presence of one or more of these species is verified, the operation plans of a proposed action will be modified to include the protection of the species and its habitat, as necessary. Possible protective measures may include seasonal or activity limitations, or other surface management and occupancy constraints.
- (3) The “Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management in the State of WY” As stated, the “Standards apply to all resource uses on public lands”. While the Guidelines (Appendix 16 of the DEIS RMP) “apply specifically to livestock grazing management practices on the BLM administered public lands.” The development and application of these standards and guidelines are intended to achieve the following four fundamentals of rangeland health: 1) proper functioning of air and watersheds; 2) proper cycling of air, water, soil nutrients, and energy; 3) attainment of state water quality standards; and 4) sustained maintenance and management of the native fauna and flora of the area, including special status species. These fundamental goals are achieved through inventory of the natural resources, appropriate management actions aimed at these resources, monitoring and evaluation of the effectiveness of these management actions, and land management adjustments as necessary.
- (4) Special Status/Sensitive Species Management, BLM Manual 6840, directs field office managers to implement special status/sensitive species programs (Appendix 9 of the DEIS RMP) within their area of jurisdiction by: 1) Conducting and maintaining current inventories, including surveys for occupancy, for special status/sensitive species on public lands; 2) Providing for the conservation of special status species in the preparation and implementation of recovery plans with which BLM has concurred, interagency plans and conservation agreements; 3) Ensuring that all actions comply with the ESA, its implementing regulations, and other directives associated with conserving special status/sensitive species; 4) Coordinating

field office activities with federal, state, and local groups to ensure the most effective program for special status/sensitive species conservation; 5) Ensuring actions are evaluated to determine if special status/sensitive species objectives are being met; 6) Ensuring all actions authorized, funded, or carried out by BLM follow the interagency consultation procedures as outlined in 50 CFR, Part 402; 7) Ensuring results of formal Section 7 consultations including terms and conditions in incidental take statements are implemented. Implementation will ensure that actions authorized by the BLM do not contribute to the need for a species to become listed.

The BLM is required to implement measures that will be utilized to avoid, minimize, or mitigate potential impacts to T&E and Special Status Species associated with implementation of the proposed RFO. Additional environmental protection measures specifically designed for other resources, such as soils, vegetation, wetlands, and visual resources, also avoid, minimize, or mitigate potential impacts to T&E and Special Status species. Site-specific mitigation measures will be identified by the RFO biologists at the project level (e.g., during APD and ROW application review processes) to protect T&E and Special Status species. To ensure compliance with mitigation measures presented in this BA and in project applications, BLM and/or a project proponent, in coordination with the BLM, will assess potential impacts to T&E and Special Status species during construction and/or implementation of those projects. This will be assessed on a case-by-case basis during field development. Project-wide mitigation measures may be waived on a case-by-case basis by the BLM if a thorough analysis determines that the resource(s) for which the measure was developed will not be impacted.

The BLM will implement or require further protection measures for T&E and Special Status species, pursuant to Instruction Memorandum No. WY-99-24, by conducting inventories, implementing protection measures, and monitoring affects of authorized actions on T&E and Sensitive Species and their associated habitats (Table 1). These measures apply to all BLM actions, including but not limited to, range management, recreation, mineral development, realty actions, and forestry practices. Additionally, the BLM may recommend that the Wyoming Oil and Gas Conservation Commission and State Land Board adopt policies to ensure ESA compliance during well permitting on state and private lands.

Table 1: BLM Requirements for Inventory, Protection, and Monitoring of T&E/ Special Status Species

BLM Requirements for Inventory, Protection and Monitoring of Threatened, Endangered, Candidate, Proposed and Sensitive Species, Rawlins Field Office, Wyoming, 2004	
Land Status	BLM Requirements¹
BLM surface/BLM subsurface	Conduct data gathering, avoid or mitigate impacts as appropriate, and monitor. Early coordination and consultation with the USFWS to benefit the species will be conducted on a case-by-case basis.
BLM surface/non-BLM subsurface	Conduct data gathering, avoid or mitigate impacts as appropriate and monitor. Early coordination and consultation with the USFWS to benefit the species will be conducted on a case-by-case basis.
Non-BLM surface/BLM subsurface ²	Request landowner permission to access lands for inventory and, if granted, conduct data gathering on affected areas and require avoidance or mitigation of impacts, and monitor as appropriate.

BLM Requirements for Inventory, Protection and Monitoring of Threatened, Endangered, Candidate, Proposed and Sensitive Species, Rawlins Field Office, Wyoming, 2004	
Land Status	BLM Requirements¹
Non-BLM surface/non-BLM subsurface ³	<p>If permission is not granted, the BLM will require project proponents to obtain access through appropriate legal action and, if obtained, conduct data gathering on affected areas and avoid or mitigate impacts, and monitor as appropriate.</p> <p>If legal access is not obtained, no on-site data gathering will be conducted, and all analyses will be done using alternate methods and so stated in appropriate analysis document.</p> <p>If it is suspected that T&E and Special Status species or their habitats may be affected, early coordination and consultation with the USFWS to benefit the species will be conducted on a case-by-case basis.</p> <p>If it is suspected that T&E and Special Status species or their habitats may be affected, early coordination and consultation with the USFWS to benefit the species will be conducted on a case-by-case basis.</p>

¹ The BLM may also require project proponents to obtain appropriate T&E and Special Status species resource data.

² For actions that are a direct result of the subsurface estate value (e.g., oil and gas exploration and development)

³ For actions that are not a direct result of the subsurface estate (e.g., ROWs).

The BLM has statutory authority under the Mineral Leasing Act of 1920, the Mineral Leasing Act for Acquired lands, and the Federal Land Policy and Management Act of 1976 to take reasonable measures to avoid or minimize adverse environmental impacts that may result from federally authorized mineral lease activities. This authority exists regardless of whether or not the surface is federally owned.

All of the proposed applicant-committed mitigation/environmental protection measures identified in this BA will be implemented on all federal lands under the Preferred Alternative. Implementation of these measures on state and private lands, where split estate exists and a federal nexus occurs, will also comply with this BA. Development activities on all lands will be conducted in accordance with all appropriate federal, state, and county laws, rules, and regulations.

These protective measures will be implemented in individual species statewide Biological Assessments for Wyoming. Though the protective measures identified in individual species in these BAs will be the most appropriate measures, a final decision that includes the approval of the State Director, BLM-WY and concurrence by the USFWS with each statewide programmatic Biological Opinion is required before implementation in this RMPPA.

Specific conservation measures are identified for each species in the Description of the Affected Environment section. In addition, the following general conservation measures for all T&E and Special Status species will be applied:

The RFO biologists will conduct surveys (following established protocol), or assume species presence, for all likely affected T&E and Special Status species habitat, or potential habitat prior to authorizing surface disturbing activities. Proposed projects will be designed and locations selected to minimize disturbances to species and habitat and if avoidance is not possible, informal consultation with the USFWS will be initiated. Projects will not be authorized during critical time periods to reduce impacts to these species. Early coordination with the USFWS to benefit the species will be conducted on a case-by-case basis.

Areas with high erosion potential and/or rugged topography (i.e., steep slopes [$>25\%$], stabilized sand dunes, floodplains, erosive and sandy soils) will be avoided, where possible, or specialized mitigation measures will be applied on a case-by-case basis to benefit T&E and Special Status species.

Roads that have the potential to impact T&E and Special Status species and are not required for routine operations and maintenance of developed and abandoned projects will be reclaimed as directed by the BLM. As necessary, these roads will be permanently blocked, re-contoured, reclaimed, and re-vegetated to benefit habitat for T&E and Special Status species.

Construction activities located within potential and/or known habitat for T&E and Special Status species will be minimized through construction site management by utilizing previously disturbed areas, using existing ROWs, and designating limited equipment/materials storage yards and staging areas to benefit habitat for T&E and Special Status species.

To ensure protection of migratory birds and wildlife, reserve, workover, and flare pits and other locations potentially hazardous to wildlife will be adequately protected by netting and/or fencing as directed by the BLM to prohibit wildlife access.

To avoid collisions and electrocution of raptors and other avifauna, any power line construction will follow recommendations by the Avian Power Line Interaction Committee (APLIC) (1994, 1996). Power lines will be placed underground and/or in locations necessary to avoid impacts to T&E and Special Status species on a case-by-case basis.

Consultation and coordination with the USFWS will be conducted as necessary for the movement, removal, and/or establishment of raptor nests and all permits required will be obtained.

All production facilities, including compressor and water disposal facilities, will be muffled and maintained, so that the noise level at significant habitat sites for T&E and Special Status species (e.g., bald eagle nests, habitat for species that rely on aural cues for successful breeding) will not exceed 49 dBAs.

The RFO policy for OHV restrictions to existing/designated roads and vehicle routes or closures, if required, will be implemented to protect plant populations and wildlife habitat.

Construction activities located within 500 ft of open water and/or 100 ft of intermittent or ephemeral channels in potential and/or known habitat for T&E and Special Status species will be avoided. Stream crossings for roads and pipelines will be constructed during the period of lowest flow (i.e., late summer or fall) and perpendicular to flow. No surface water or shallow ground waters in connection with surface waters will be utilized for proposed projects. Proper erosion control techniques, such as water bars, netting, rip-rap, and mulch would be implemented.

Pesticide applications and biological control agents will be allowed within known T&E habitat on a case by case basis. Where possible, biological control of pests would be used rather than chemical control.

Where needed, pesticide use would be applied by hand within ¼ mile of habitat and only in cases where insect or weed outbreaks have the potential to degrade area ecological health. Outside the ¼ mile buffer, aerial application of pesticides would be carefully planned to prevent drift. The BLM shall work with APHIS and the USFWS to select a pesticide and method of application that will most effectively manage the infestation and least affect the species.

Riparian habitats will be maintained, improved or restored to provide wildlife habitat, improve water quality and enhance forage conditions. When planting or seeding vegetation in areas identified as T&E or Special Status species habitat, only native species will be selected.

In the event that a T&E species is found, killed, or injured during project activities, or a dead individual is encountered, the USFWS Wyoming Field Office (307-772-2374) and the USFWS Law Enforcement Office (307-261-6365) will be notified within 24 hours of discovery.

The BLM will participate with development of species specific recovery plans in coordination with the USFWS and other agencies. Populations and habitat on BLM-administered lands will be monitored to determine if recovery objectives are being met.

BLM-administered public lands that contain identified habitat for T&E species will not be exchanged or sold, unless it benefits a species.

The Statewide Programmatic Biological Assessments and Statewide Programmatic Biological Opinions authorized for each species, including all of the reasonable and prudent measures and terms and conditions, will be implemented for the RMPPA. Informal conferencing and consultation with the FWS would occur for authorized activities that would potentially affect the habitat for all threatened, endangered, candidate, and proposed species within the RMPPA.

Description of the Affected Environment

The following information identifies biological data on listed species, including Special Status species that are present, or have the potential to be present, within the RMPPA. Information includes the listing status, species description, life history,

Black-footed Ferret (*Mustela nigripes*)

Listing Status: Federal – Endangered, 1967

Species Description

The black-footed ferret is a member of the weasel family (*Mustelidae*), which includes the skunk, badger, fisher, marten, otter, mink, wolverine, and weasel. Black-footed ferrets have a long thin body, short legs, and a very flexible spine, allowing them to run through small tunnels and turn in tight spaces. Adults are 18 to 22 inches (.46 to .55m) long, and weigh between 1 and 2½ pounds (.450 to 1.135 kg). Ferrets live alone except during the breeding season. The kits are born in May or June, usually in litters of three or four.

Larger than weasels, black-footed ferrets are long, slender-bodied animals similar in size to a mink. They are characterized by a brownish-black mask across the face, a brownish head, black feet and legs, and a black tip on the tail. The middle of the back has brown-tipped guard hairs that create the appearance of a dark saddle.

Life History

The black-footed ferret is closely associated with prairie dogs, depending almost entirely on the prairie dog for its survival. The black-footed ferret's diet may also contain some other small mammals and birds. Potential areas of ferret habitat can be delineated because of the ferret's association with prairie dogs. The planning area is within the range of black-tailed and white-tailed prairie dogs, and ferrets may occur within colonies of this species.

Their body adaptations allow them to live underground in prairie dog colonies where the temperature is more uniform than on the surface, it is easier to conserve water, and they are protected from surface predators. Potential predators include badgers, coyotes, bobcats, golden eagles, great-horned owls, ferruginous hawks, and domestic dogs. Primarily nocturnal, ferrets spend much of their time below ground and are rarely seen during daylight hours. This behavior is probably one of the reasons for so few sightings recorded in this planning area and elsewhere. Black-footed ferrets are strong and limber, allowing them to catch and kill prey larger than themselves.

The USFWS has determined that, at a minimum, potential habitat for the black-footed ferret must include a single white-tailed prairie dog town or complex of greater than 200 acres (80.9 hectares) and black-tailed prairie dog town or complex greater than 80 acres (32.4 hectares), or a complex of two or more neighboring prairie dog towns, each less than 4.3 miles (6.9 km) from the other and totaling 200 (80.9 hectares) acres for white-tailed prairie dogs and 80 acres (32.4 hectares) for black-tailed prairie dog and whose density meets or exceeds 8 burrows per acre (.4047 hectares) (USFWS 1989). Black-footed ferret habitats are directly associated with the presence of prairie dog colonies. Grassland plains are the predominant habitats associated with both the ferret and prairie dog.

Population Distribution

Black-footed ferrets are the only ferrets native to North America. They have lived in North America for at least 30,000 years and have lived everywhere that prairie dogs have lived. At one time, black-footed ferrets and prairie dogs ranged throughout the Great Plains and intermountain basins of the Rockies, from Canada to Mexico. The present range is unknown, but it is certainly much smaller than the historic range. Several records (mostly unverified) from Montana, North Dakota, South Dakota, Nebraska, Oklahoma, Kansas, Colorado, Wyoming, and New Mexico were reported in the 1973 Proceedings of the Black-footed Ferret and Prairie Dog Workshop –September 4-6 (Clark et al., 1983).

Black-footed ferrets were considered extinct until a small population was discovered near Meeteetse, Wyoming in 1981. Following outbreaks of distemper, surviving black-footed ferrets were brought into captivity and a captive breeding program was initiated. Black-footed ferrets were re-introduced in the Shirley Basin of central Wyoming in 1991 (see Black-footed Ferret Nonessential Experimental Population in Shirley Basin). This re-introduction effort continues with the aid of supplemental releases, when possible.

Field Office Distribution

Populations of black-footed ferrets are undetermined in the planning area. There are known populations of black-footed ferrets located within the Shirley Basin area and are identified as a non-essential experimental population. The USFWS has conducted some surveys and prairie dog colony inventories in the field office area since 1981. Reintroductions of ferrets began in 1991 with the release of a group into the Shirley Basin area. Since then 228 ferrets have been released there. Successful reproduction in the wild has taken place. Biologists stopped releasing ferrets in the Shirley Basin after 1995 because of disease concerns and decreasing habitats. Other ferrets within the RMPPA area include seven sightings

with the latest of these occurring in June 1977, about five miles north of Rawlins, Wyoming on State Highway 287 (USDI-BLM, 2000).

There have been numerous sightings of black-footed ferrets throughout the RMPPA over the decades. Clark (1978) reports four observations of black-footed ferrets near Rawlins, twelve observations near Riverside, five observations near Saratoga, 19 observations near Laramie, six observations near Medicine Bow, and five observations near the vicinity of Rock River, Wyoming from 1902-1977.

Two black-footed ferret sightings and the discovery of a partially buried black-footed ferret skull have been recorded in the Continental Divide/Wamsutter II Natural Gas Project Environmental Impact Statement area (CD/WII EIS area), located north and south of Wamsutter, Wyoming. There have been historical sightings of ferrets in this area in the following years: 1) July 1972, two young ferrets were seen in the southern portion of the area south of I-80; 2) August 1975, a ferret was observed in saltbush habitat in the northern portion of the area; and 3) August 1981, a partially buried skull was found in the northeastern portion of the area.

Numerous black-footed ferret surveys have been conducted throughout the field office area for a diversity of proposed projects and are on file at the RFO. These surveys include, but are not limited to, projects for natural gas pipelines, 2-D and 3-D seismic lines, coalbed methane pods, coal development areas, access roads, well pads, reserve pits, water pipelines, fiber optic lines, airport expansion, powerlines, highway re-surface projects, substation construction, ancillary facilities for oil and gas development, and U.S. Bureau of Reclamation lands. The WGFD has compiled black-footed ferret sighting reports, which include areas within the RMPPA. Surveys that have been conducted within the RMPPA throughout the last four decades, from 1978 to 2003, are summarized in Table 2 and have resulted in a range of findings. Generally, no black-footed ferrets or ferret signs have been found; however, in some cases, biologists have found skulls that have been identified as black-footed ferret and have been aged to determine potential years of activity.

Table 2: Black-footed Ferret Surveys in the Rawlins Field Office Area 1978-2002

Project Location	Date of Surveys	Survey Method	Survey Results
T. 17-18 N., R. 94 W.; T. 19 N., R. 96 W.	Aug.-Sept. 2003	Nocturnal-spotlight	No ferret or sign observed
T. 13-15 N., R. 97-99 W.	June-July 2002	Nocturnal-spotlight	No ferret or sign found; skull found
T. 16 N., R. 91 W.,	July 2002	Nocturnal-spotlight	No ferret or sign found
T. 23 N., R. 85 W., Sec. 2-5, 9-10; T. 24 N., R. 85 W., Sec. 27, 33-35	Jan.-March 2002	Diurnal searches	No ferret or sign found
T. 17 N., R. 93 W., Sec. 35-36; T. 16 N., R. 93 W., Sec. 2-3, 10-15, 23-25	Sept.-Oct. 2001	Nocturnal spotlight	No ferret or sign found
T. 18 N., R. 93 W., Sec. 20-22, 28-29, 32-33; T. 17 N., R. 93 W., Sec. 4-5, 8-9	October 2001	Nocturnal-spotlight	No ferret or sign found
T. 18 N., R. 93 W., Sec. 18-20, 29	August 2001	Nocturnal-spotlight	No ferret or sign found
T. 26 N., R. 90 W., Sec. 14, 23-25, 36; T.	September 2001	Nocturnal-spotlight	No ferret or sign found

Project Location	Date of Surveys	Survey Method	Survey Results
26 N., R. 89 W., Sec. 31; T. 25 N., R. 89 W., Sec. 6			
T. 16 N., R. 91 W., Sec. 9, 16, 17, 20	September 2001	Nocturnal-spotlight	No ferret or sign found
T. 15 N., R. 91 W., sec. 4-8, 16	August 2001	Nocturnal-spotlight	No ferret or sign found
T. 16 N., R. 93 W., sec. 2, 11	Sept.-Oct. 2001	Nocturnal-spotlight	No ferret or sign found
T. 16 N., R. 91 W., Sec. 9, 16, 17, 20	October 2000	Nocturnal-spotlight	No ferret or sign found
T. 17 N., R. 93 W., Sec. 25, 36; T. 17 N., R. 92 W., Sec. 31	August 1994	Nocturnal- spotlight	No ferret or sign found
T. 19 N., R. 96 W., Sec. 7, 9, 10; T. 19 N., R. 97 W., Sec. 11-12	September 1991	Nocturnal - spotlight	No ferret or sign found
T. 16 N., R. 93 W., Sec. 1, 11, 12	August 1990	Nocturnal - spotlight	No ferret or sign found
T. 16 N., R. 93 W., Sec. 2, 3, 10, 11	August 1990	Nocturnal-spotlight	No ferret or sign found
T. 17 N., R. 84 W., Sec. 14, 15, 16, 21, 22	October 1990	Nocturnal-spotlight	No ferret or sign found
T. 23 N., R. 94-95 W.; T. 24 N., R. 94-95	August 1989	Nocturnal-spotlight Diurnal-searches	No ferret or sign found
T. 24 N., R. 78 W.	Feb-March 1898	Diurnal searches	No ferret or sign found
T. 26 N., R. 84 W., Sec. 11-14	Dec – Feb 1989	Diurnal searches	No ferret or sign found
T. 21 N., R. 79 W., Sec. 23-26, 35-36	Feb-March 1989	Diurnal searches	No ferret or sign found
T. 26 N., R. 89 N., Sec 8, 17-18; T. 26 N., R. 90 N., Sec. 2, 10-11, 14, 15	August 1985 May 1988	Nocturnal, modified guidelines	No ferret or sign found
Milepost 0-112	July-Aug. 1985	Nocturnal-spotlight	No ferret or sign found
T. 28 N., R. 80 W., Sec 4,5, 8,9; T. 28 N., R. 81 W., Sec. 12-14	Sept-Oct 1985	Nocturnal-spotlight	No ferret or sign found
T. 26 N., R. 89-92; T. 27 N., R. 89-92	August 1985	Nocturnal-spotlight Diurnal searches	No ferret or sign found
Coal areas: Corral canyon, Cow Creek, Cedars, Savery Lease, Red Desert	June-Sept 1981	Diurnal searches Nocturnal spotlight	No ferrets observed; skull found (Red Desert)
Pathfinder and Seminoe Reservoirs and borders	July-Sept. 1980	Diurnal searches Nocturnal -spotlight	No evidence of ferret
Pathfinder and Seminoe Reservoirs and borders	September 1979	Diurnal searches Nocturnal-spotlight	No ferrets or sign found, except skull found
Hanna and China Butte, Coal Areas	Feb-Sept. 1979	Diurnal searches Nocturnal-spotlight	No live ferrets found; three skulls found

Project Location	Date of Surveys	Survey Method	Survey Results
		Dogs used	(Hanna)
Red Rim, Seminoe 1, Hanna South, Medicine Bow Bypass, Carbon Basin Coal Areas	June-Sept. 1978	Diurnal searches Nocturnal-spotlight	No ferrets found; trenching found Carbon Basin site
South and northeast Medicine Bow; northeast Rock River	March-Aug. 1978	Diurnal searches Nocturnal-spotlight Track stations with acoustic and scent lures	One black-footed ferret skull, five trenches, one ferret scat found

Reproduction and Survivorship

Black-footed ferrets have not been observed mating in the wild, but captive black-footed ferrets have been observed breeding in March and early April. Support for believing wild black-footed ferrets breed during this period comes from an adult male black-footed ferret road-killed in early March in northwestern Wyoming which showed spermatogenesis. Further evidence comes from winter snow tracking information which showed significant increases in movements by individuals during this period.

The time of parturition is also unknown, but is suspected to occur in May and early June. Captive black-footed ferrets have a known gestation period of 42-45 days and litter size ranged between 3-4 in Wyoming and 3-5 in South Dakota. In Wyoming, black-footed ferret family units remain together until late August. At this time, juveniles still rely on their dam for food to some extent, but are frequently separated from siblings in different burrows. The young spend more and more time on their own and are independent by mid-September (Clark et. al., 1983).

Management Status Recovery and Conservation Planning

The national recovery objective developed by the USFWS in 1998 for this species highlights several actions to ensure the immediate survival of the black-footed ferret. These actions included increasing the captive population of black-footed ferrets to a census size of 200 breeding adults by 1991, establishing a pre-breeding census population of 1,500 free-ranging black-footed ferret breeding adults in 10 or more populations with no fewer than 30 breeding adults in any population by the year 2010, and encouraging the widest possible distribution of reintroduced black-footed ferret populations.

The conservation measures applicable to BLM-authorized actions for the black-footed ferret include both habitat conservation measures and species conservation measures. These measures are listed below.

Habitat Conservation Measures

If prairie dog towns/complexes suitable as black-footed ferret habitat are present at the proposed project level, attempts will be made to locate all project components at least 50 m (up to 200 meters pursuant to FLPMA) from these towns/complexes to avoid direct impact to towns.

All white-tailed prairie dog towns/complexes greater than 200 acres in size and black-tailed prairie dog towns/complexes greater than 80 acres will be avoided. If avoidance is not possible, these areas will be assessed and mapped at the proposed project level. Associated burrow densities of potentially affected towns will be determined, and when habitat is present, a black-footed ferret survey will be conducted, pursuant to Service & Bureau approved techniques.

Species Conservation Measures

USFWS Fact sheets shall be posted in common areas and circulated in a memorandum among all BLM employees and service providers. Fact sheets shall illustrate the black-footed ferret and its sign; describe morphology, tracks, scat, skull, habitat characteristics, behavior, current status, and causes of decline. Employees will not have pets on work sites within potential or known ferret habitat since canine distemper can be transmitted to black-footed ferrets.

Operators, contractors, and project proponents will be shown how to identify a black-footed ferret and its sign and will be provided with information about its habitat requirements, natural history, status, threats, possible impacts of project development activities, and ways to minimize these impacts. Employees will not have pets on work sites within potential or known ferret habitat since canine distemper can be transmitted to black-footed ferrets

If any black-footed ferrets or their sign are found, or in the event that surveys find a black-footed ferret or its sign, all previously authorized, project-related activities (actions or any future application that may directly, indirectly, or cumulatively affect the colony/complex) on-going in such towns or complexes will be suspended immediately and Section 7 consultation re-initiated with the USFWS.

Observations of black-footed ferrets, their sign, or carcasses on the project area and the location of the suspected observation however obtained, will be reported within 24 hours to the appropriate Bureau wildlife biologist and Field Supervisor of the U.S. Fish and Wildlife Service office in Cheyenne, Wyoming, (307) 772- 2374. Observations will include a description including what was seen, time, date, exact location, and observer's name and telephone number. Carcasses or other suspected ferret remains will be collected by the Bureau or Service employees and deposited with the Service's Wyoming Field Office.

Best Management Practices

BLM should periodically evaluate potential habitat for translocation or reintroductions in coordination with the Service when possible.

BLM should conduct research to evaluate the impacts of BLM authorized activity on black-footed ferret habitat.

BLM should continue to follow the recovery plan and review activities to ensure consistency and compliance.

Black-footed Ferret Nonessential Experimental Population in Shirley Basin

Listing Status: Federal - Nonessential Experimental Population, 1991

Species Description

The USFWS, in cooperation with the Wyoming Game and Fish Department (WGFD), reintroduced captive-raised black-footed ferrets (*Mustela nigripes*) into the 2,068 square mile Shirley Basin/Medicine Bow Management Area (Shirley Basin) in 1991. This population has been designated a nonessential experimental population in accordance with the ESA. This population is managed in accordance with provisions of the special rule for this species.

Life History

A life history description of black-footed ferrets is described above under black-footed ferret. The Shirley Basin ferrets were originally captive-raised; however, at this time, there are naturally occurring ferrets within the Shirley Basin ecosystem.

Population Distribution

The black-footed ferret was listed in 1967 as endangered. The last known wild population near Meeteetse, Wyoming was devastated by canine distemper in 1985-1986. Eighteen surviving black-footed ferrets were taken into captivity in 1986-1987 to prevent extinction and to serve as founder animals in a captive propagation program aimed at eventually reintroducing the species into suitable habitat in the wild. The captive breeding program went from 18 animals in 1986 to over 300 animals in 1991 (USFWS, 1991a).

Field Office Distribution

The Shirley Basin/Medicine Bow Management Area (Shirley Basin) is the primary recovery area within the experimental population. The Shirley Basin area includes approximately 729,184 acres of private land, 197,601 acres of public land, and 43,241 acres of state trust lands for a total of 1,323,856 acres in Carbon, Albany, and Natrona Counties. The black-footed ferret habitat is associated with 74 of the 121 tracts of private lands. The highest white-tailed prairie dog concentrations since 1989 have been in the Shirley basin area (USFWS, 1991a).

Reproduction and Survivorship

There were 228 black-footed ferrets released in the Shirley Basin area from 1991 to 1994. The black-footed ferret release program was terminated in 1994 when the prairie dog population fell below 50% of the 1991 base population. Spotlight surveys for black-footed ferrets were conducted from 1991-1996 and again in 2000-2001. Black-footed ferret surveys were not conducted in 1997-1999.

There were five ferrets observed in 1997 and 15 ferrets observed in 2000 (including four litters of kits). In 2001, a minimum of 19 black-footed ferrets were observed, including three litters with at least ten juveniles (WGFD 2002). In 2001, the WGFD estimated that there are 27,000 acres of prairie dog towns in the Shirley Basin area. In addition, the agency estimated that there are approximately 24-25 black-footed ferret families, or about 100 black-footed ferrets (Apple, 2001).

The overall downward trend in active prairie dog burrows and ferrets may have been a combination of several factors. Sylvatic plague, active in Shirley Basin for several years, may or may not have been the primary cause of decreasing prairie dog numbers (WGFD, 2002). In 2001, two out of 200 mice tested positive for sylvatic plague in the area suggesting that this seems to have abated for the time being (Apple, 2001). Four out of 22 coyotes tested positive for canine distemper; however, in 2001, distemper did not appear to cycle for that particular year (Apple, 2001). In the near absence of sylvatic plague, the population has become relatively stable from 1997 to 2000, though drought-like conditions hampered prairie dog recovery through 2000. Increased moisture in 2001 appears to have resulted in increased prairie dog densities. Other factors that may negatively impact the prairie dog population include: 1) population decline due to drought the previous summer and poor pup production; 2) drowning of significant numbers of prairie dogs during unusually heavy rains and runoff; 3) substantial recreational shooting by organized groups of shooters during March and April, when females are pregnant, or May and June, when pups are totally dependent upon their mothers for sustenance and are very vulnerable to shooting; and 4) population shifting-immigration or emigration across established prairie dog town boundaries (WGFD, 2002).

The 2003 survey effort was the smallest survey effort conducted in Shirley Basin since its inception nearly thirteen years ago. Twelve surveyors covered approximately five percent of the entire prairie dog complex in Shirley Basin in six nights. There were black-footed ferrets in nearly every prairie dog town surveyed. There were fifty-two black-footed ferrets, including ten litters, found within those six survey nights. Wild-born kits were again documented in Shirley Basin and ferrets were located well over nine miles from where the original reintroduction took place. Nearly nine years after the last black-footed ferret was released in Shirley basin, new opportunities exist for ferrets in this area and in Wyoming. The USFWS and Black-footed Ferret Recovery and Implementation Team, are currently revising recovery goals for the black-footed ferret and updating the recovery plan (Grenier, 2004).

Management Status Recovery and Conservation Planning

A Cooperative Management Plan was developed that outlined how ferret reintroductions would occur so as to be compatible with existing and potential land uses. The area was designated into two management zones: Primary Management Zone 1 (PMZ1) and Primary Management Zone 2 (PMZ2) due to the extensive size of the overall area (USFWS, 1991a).

The ESA provides for the designation of specific populations of listed species as “experimental populations”. This designation increases the USFWS’s flexibility to manage reintroduced populations of endangered species because experimental populations may be treated as threatened species. There is more discretion for devising management programs when species are listed as threatened. Additional flexibility occurs if the experimental population is found to be “nonessential”. The population of black-footed ferrets in the Shirley Basin area is classified as a nonessential experimental population. These black-footed ferrets are treated as if they are a proposed species (USFWS, 1991b).

Spotlighting has been an effective technique for locating black-footed ferret presence; however, there is reason to doubt its effectiveness as a survey method in the conditions that currently exist in the Shirley Basin area. During the 1994, 1995, and 2000 spotlight surveys, there were occasions in which ferrets were observed only briefly, or green eye shine could not be identified to species. In 2000, similar to 1995 and 1996 summer surveys, an effort was made to positively identify the animal by placing an observer at the site for one night following observation. However, as in previous years, the observer failed to positively identify the individual. Some ferrets may be exhibiting avoidance behavior with respect to spotlights and possibly human or vehicle presence; therefore, a population estimate based upon spotlighting data should be considered a minimum number (WGFD, 2002).

Habitat and Species Conservation Measures

Recommended management actions for the Shirley Basin Nonessential Experimental black-footed ferret population will comply with the DOI Federal Register, Vol. 56, No. 162, August 21, 1991, Rules and Regulations. This notice describes “Endangered and Threatened Wildlife and Plants: Establishment of a Nonessential Experimental Population of Black-footed Ferrets in Southeastern Wyoming”.

Preble’s Meadow Jumping Mouse (*Zapus hudsonius hudsonius*)

Listing Status: Federal – Threatened, May 13, 1998

Species Description

The Preble’s meadow jumping mouse (Preble’s) is a small rodent with hind legs much longer than its forelegs. The tail is longer than the body and it is sparsely haired. Tail coloring is darker on top than the underside. The Prebles’ eyes are midway between the nose and the ear and the ears are dark and edged with white. There are 18 teeth, with upper incisors having distinct grooves on their outer faces. Cheek

pouches are absent. Fur on the back is yellow olive-brown with scattered, long, black-tipped hairs, which create a faint dorsal stripe. The sides are light yellow-brown, and the belly is white to light buff. Young tend to have softer, lighter fur than the adults.

The adult measurements are: total length 180-220 mm (7.09-8.66 inches); head and body length less than 89 mm (3.50 inches); tail 115-136 mm (4.53-5.35 inches); hind foot 28-31 mm (1.10-1.22 inches); ear 11-16 mm (0.46-0.63 inches); weight 12-22 g (0.42-0.78 ounces) (Clark and Stromberg 1987, Compton and Hugie 1993). In addition, incisive foramina shorter than 4.6 mm (0.18 inches); palatal breadth at last molariform tooth less than 4.2mm (0.17 inches); condylobasal length usually less than 20.3mm (0.80 inches); and maxillary tooththrow usually 3.7mm (0.15 inches) or less (Whitaker and Wrigley 1972).

Life History

Typical habitat for the Preble's comprises well-developed plains riparian vegetation with adjacent, undisturbed grassland communities and a nearby water source (USFWS, 2002). Preble's are assumed to occur in brushy riparian ecosystems along foothills and prairies east of the Front Range of the Rocky Mountains. Elevations of jumping mice occurrences within the suspected range of Preble's seem to be less than 7,800 ft (2377 m) (Pague and Grunau 2000), but they have been documented at over 8,000 feet (2438 m) in the Laramie Mountains of Wyoming (Beauvais 2001). There is likely distributional overlap with potentially extensive hybrid zones, particularly between Preble's and the meadow jumping mouse (*Z. princeps*). Attempts to genetically differentiate Preble's from *Z. princeps* have been largely unsuccessful and extensive morphological comparisons are now underway to help clarify the issue (Beauvais 2001).

Shenk and Eussen (1998) determined that suitable Preble's habitat appears to have at least two major components. The first component is a supply of open water, at least in part of the active season. Secondly, dense cover is needed. The mice movement patterns include the use of riparian habitats, upland habitats, and hibernation habitats.

Food Habits

Studies of jumping mouse food habits in central and eastern United States indicate that they are governed by availability more than preference (Whitaker 1963). Grass seeds of several species are probably the most important component of the diet, and mice will shift to those species that have available seed. Preble's will clip tall vegetation to get to the more nutritious terminal buds. Invertebrates and fungi are also readily eaten. Mice feed on both adult and larval invertebrates, especially *Coleoptera* (beetles). Invertebrate feeding is very important in the spring as mice emerge from hibernation, and may consist of half of the diet at that time. Mice also feed on various species of fungi, which are often encountered during burrowing activity. As the growing season progresses, graminoid seeds dominate the diet.

Most of the information on the Preble's derives from research completed in Colorado. Research in Douglas County, Colorado, indicates that Preble's are consuming more fungi and arthropods than researchers expected (Grunau et. al 1999). This study also indicates that shifts in diet content match movement shifts, but a cause/effect relationship is unclear. Researchers in the Douglas County project have also observed that Preble's from different stretches of streams regularly congregate at the same feeding "hotspots."

While fecal analyses have provided the best data on the Preble's diet to date, they overestimate the components of the diet that are less digestible. Based on fecal analyses the Preble's eats insects; fungus; moss; pollen; willow (*Salix spp.*); lamb's quarters (*Chenopodium spp.*); Russian thistle (*Salsola spp.*); sunflowers (*Helianthus spp.*); sedges (*Carex spp.*); mullein (*Verbascum spp.*); grasses such as cheatgrass

(*Bromus spp.*), fescue (*Festuca spp.*), bluegrasses (*Poa spp.*), alkali sacaton (*Sporobolus spp.*) and wheatgrasses (*Agropyron spp.*); bladderpod (*Lesquerella spp.*); horsetail (*Equisetum spp.*); and assorted seeds (Shenk and Eussen 1998, Shenk and Sivert 1999a). The diet shifts seasonally; it consists primarily of insects and fungus after emerging from hibernation, shifts to fungus, moss, and pollen during mid-summer (July-August), with insects again added in September (Shenk and Sivert 1999a). The shift in diet along with shifts in mouse movements suggests that the Preble's may require specific seasonal diets, perhaps related to the physiological constraints imposed by hibernation (Shenk and Sivert 1999a).

Preble's are not known to store food; therefore, they must consume food prior to hibernation. Because sufficient energy to survive over winter must be provided by fat stores accumulated prior to hibernation, the availability of adequate food resources during this time of year is a critical factor for these mice. It seems reasonable to assume that graminoid seeds are especially important during this period due to the proportionally high fat content of this food source (Grunau et al., 1999).

Riparian Habitats

All forms of *Zapus* in Wyoming are strongly associated with riparian areas and are seldom found outside of heavy vegetation immediately adjacent to flowing streams. The Preble's meadow jumping mouse is strongly associated with foothills and plains riparian areas. The mice are often found in dense, herbaceous riparian vegetation. Known locations sometimes have an overstory canopy layer, but usually have a well-developed shrub layer and a thick herbaceous layer. Most often the shrub cover consists of willow species, but the species composition seems to be secondary to the overall presence of a mature shrub component. A distinguishing characteristic for Preble's habitat is the presence of a dense, herbaceous ground cover. Most often, Preble's are found in close association with these dense, riparian habitats with decreasing numbers occurring farther from this type of habitat (Corn et al. 1995, Meaney et al. 1996). Based on a study of kidney structure, it is believed that Preble's are dependent upon open water (Wunder 1998), which may explain their close association to these habitats.

Preble's appear to prefer riparian habitats that are structurally diverse (Shenk and Eussen 1998). The herbaceous understory is primarily grasses or forbs or mixtures of the two. Research indicates Preble's prefer areas dominated by more than two understory species. The tall shrub canopy at most sites is willow, although scrub oak (*Quercus gambelli*), birch (*Betula spp.*), and alder (*Alnus spp.*) were also used by Preble's (Armstrong et al., 1997). Preble's appear to tolerate weedy or exotic species in areas that are structurally diverse and species rich, although Canada thistle (*Cirsium arvense*) is often found in Preble's habitat. Preble's don't appear to have an affinity to any single plant species but, instead, favors sites that are structurally diverse and provide adequate cover and food throughout its life cycle.

Preliminary estimates of habitat use indicate Preble's spend 70% of the time in riparian shrub communities and 30% in upland grasslands, but specific activities in each habitat type are unknown (Grunau et al., 1999). The amount of riparian shrubs seems to be the best indicator of quality Preble's habitat (White and Shenk 2000).

Upland Habitats

Preble's have rarely been trapped in uplands adjacent to riparian areas (Dharman 2001). However, in detailed studies of Preble's movement patterns using radio telemetry, Preble's has been found feeding and resting in adjacent uplands (Shenk and Sivert 1999b, Ryon 1999, Schorr 2001). These studies reveal that Preble's regularly uses uplands at least as far out as 100 m (330 ft) beyond the 100-year floodplain (Ryon 1999). Preble's also move considerable distances along streams, as far as 1.6 km (1.0 mi) in one evening (Ryon 1999, Shenk and Sivert 1999a).

Upland use has occurred during the day as well as at night. Studies have suggested that upland grasslands may serve as feeding “hotspots” (Grunau et al., 1999), but this has not been specifically observed on the U.S. Air Force Academy (USAFA) in Colorado Springs, Colorado. Research on the Air Force base indicates that Preble’s are regularly and consistently using upland grasslands adjacent to riparian habitat. These results indicate this habitat type must be important for some life history component.

Ongoing research indicates use of upland habitats is higher than originally presumed and this buffer area may not be sufficient (Shenk and Silvert 1999a). The research suggests use of the buffer zone and even habitat farther away was higher than anticipated and further research was needed to determine the extent of upland habitat use.

The upland areas used by Preble’s can be characterized as a mosaic of grasslands, oak scrub, and ponderosa pine woodlands (Grunau et al., 1999). Periodic fire and grazing by native ungulates were major ecological processes that influenced the vegetation. The patchy nature of fire and grazing resulted in a shifting mosaic of vegetation types on the ground over time.

Historic fire return intervals for the Front Range ponderosa pine forests (which include the Laramie Range) range between 8 and 45 years (Laven et al. 1980, Mehl 1992). Short-grass to mixed grass prairie on level topography burned approximately every 5 to 10 years, and approximately 20 to 30 years on dissected topography (Wright and Bailey 1980).

Hibernation Habitat

The Preble’s is a true hibernator. Meadow jumping mice spend at least 7 months per year in hibernation, in underground burrows that they create themselves. One confirmed hibernaculum documented in Colorado was a leaf litter nest approximately 30 cm (11.8 inches) below ground, 9 meters (29.5 ft) above a creek bed under thick shrub cover of chokecherry (*Prunus virginiana*), poison ivy (*Toxicodendron rydbergii*) and snowberry (*Symphoricarpos spp.*) (Grunau, et al. 1999).

Extensive research at the USAFA, Colorado Springs, Colorado, resulted in the documentation of 7 possible hibernacula. Distances from a creek ranged from 7 meters (23 ft) to 31 meters (101 ft); there was no consistency in aspect among these sites. Four sites were within the riparian willow shrub zone, and three were outside, but all seven sites were under some shrubby vegetation (snowberry, willow, or oak) (Grunau, et a. 1999). Only two sites were outside the 100-year floodplain. Based on this limited data from presumed hibernacula, it appears Preble’s do not move an appreciable linear distance along the waterway to hibernate. Preble’s will move away from the waterway to hibernate, but rarely relocate to another section of stream that was not previously used during their activity period.

Investigation of habitat associations and movement patterns at the USAFA, Colorado Springs, Colorado, have found fifteen apparent Preble’s hibernacula (hibernation nests) located through radio telemetry, all within 78 m (260 ft) of a perennial streambed or intermittent tributary (Bakeman and Deans 1997, Shenk and Sivert 1999a, Schorr 2001). Of these, one was confirmed through excavation (Bakeman and Deans 1997); others were left intact to prevent harm to the mice. Hibernacula have been located under willow, chokecherry, snowberry, skunkbrush sumac (*Rhus spp.*), clematis (*Clematis spp.*), cottonwoods (*Populus spp.*), Gambel’s oak, thistle (*Cirsium spp.*), and alyssum (*Alyssum spp.*) (Shenk and Sivert 1999a). Four of six hibernacula found by Schorr (2001) using radio-telemetry were located in close proximity to coyote willow (*Salix exigua*). Bakeman and Deans (1997) found one excavated hibernaculum 9 m (30 ft) above the streambed, in a dense patch of chokecherry and snowberry. The nest was constructed of leaf litter 30 centimeters (cm) (12 in) below the surface in coarse textured soil.

Males emerge from hibernation prior to females (late April to early May and early to late May, respectively). In Colorado, adult Preble's have been captured as early as May 5 for males and May 21 for females, and as late as October 10. Juveniles have been captured as late as October 26 (male) and 27 (female). At the USAFA, in Colorado Springs, Colorado, the earliest capture was May 19, the first day of trapping for that particular study, although individuals may have been active earlier. Based on telemetry data, the latest activity observed at the base was mid-October. Based on these dates, the active period for Preble's is roughly May 1 through October 31 (Armstrong et al. 1997).

Day Nests

The Preble's constructs day nests composed of grasses, forbs, sedges, rushes, and other available plant material. They may be globular in shape or simply raised mats of litter, and are most commonly above ground, but also can be below ground. They are typically found under debris at the base of shrubs and trees, or in open grasslands (Ryon 2001). An individual mouse can have multiple day nests in both riparian and grassland communities (Shenk and Sivert 1999a), and may abandon a nest after approximately a week of use (Ryon 2001).

Population Distribution

The full species is widespread and secure in North America. However, the Preble's subspecies is restricted to a narrow strip along the Front Range of the Rocky Mountains from central Colorado to east-central Wyoming. Knowledge about the current distribution of Preble's comes from collected specimens, and live-trapping locations from both range-wide survey efforts and numerous site-specific surveys efforts conducted in Wyoming and Colorado since the mid-1990s (USFWS, 2002). This species is known to occur in only four counties in Colorado and two counties in Wyoming. Historical surveys document its former presence in five additional counties in Colorado and three additional counties in Wyoming (USFWS, 1997).

Field Office Distribution

The semi-arid climate in southeastern Wyoming and eastern Colorado limits the extent of the riparian corridors and restricts the range of the Preble's in this region (USFWS, 2002). In Wyoming, the Preble's were not found at five sites within their historical range during the 1993 surveys completed by the USFWS (USFWS, 1997). The Preble's meadow jumping mouse has been recently documented in two counties, along Crow Creek at F.E. Warren Air Force Base (Laramie County) and in the Lodgepole Creek drainage, within the Medicine Bow National Forest (Albany County). The Wyoming Cooperative Research Unit successfully captured two Preble's on F.E. Warren Air Force Base, Laramie County, in the 1995 field season (Garber 1995).

Garber (1995) conducted Preble's surveys at four Wyoming sites during the 1995 field season. He was unable to locate any Preble's on F.E. Warren Air Force Base, but did find Preble's at two locations in the Lodgepole Creek drainage within the Medicine Bow National Forest in Albany County. The Colorado Natural Heritage Program surveyed for Preble's at Warren Air Force Base in 1996 and captured 8 apparent Preble's in 2,200 trap-nights of effort (Schuerman and Pague 1997). The July 17, 2002 Federal Register (Page 47153-47210) states that in Wyoming, capture locations of mice confirmed as the Preble's and locations of mice identified in the field as Preble's extend in a band from the town of Douglas (just outside the RMPPA) southward along the Laramie Range to the Colorado border, with some captures in Laramie County, as well as in other counties outside of the RMPPA.

Reproduction and Survivorship

The Preble's meadow jumping mouse may produce up to three litters per season (Whitaker 1963), with an average of 5 to 6 young per litter (Quimby 1951). Population peaks occur in early to mid-June, August, and possibly September (Whitaker 1963). Age at first reproduction is poorly known, but *Z. hudsonius* females have been known to give birth at three months of age (Quimby 1951).

Not much is known about Preble's longevity, but some recaptured individuals have survived at least three years. Estimates of survival rates based on mark-recapture studies of 69 individuals at the USAFA, Colorado Springs, Colorado, indicate that approximately 52% of the individuals from July survive until September (Grunau et al. 1999). In a Douglas County, Colorado, study from 1998, over-summer survival (June 1 to October 5) was estimated at approximately 36%. Studies in Boulder County, Colorado, indicate approximately 60% survival over summer (June to August) (Meaney et al. 1999).

Over-winter survival rates are not well known. Meaney et al. (1999) calculated a winter survival rate of approximately 22% in Boulder County, Colorado. Over-winter loss of 67% was observed in a *Z. hudsonius* population in New York, presumably from insufficient fat stores (Whitaker 1963). Other observed sources of mortality of *Z. hudsonius* include cannibalism (Sheldon 1934), and accidental drowning, roadkill, and predation by house cats, garter snakes, rattlesnakes, and fox (Grunau et al. 1999). Additional presumed causes of mortality include starvation, exposure, and disease (Whitaker 1972).

Management Status Recovery and Conservation Planning

The Preble's is closely associated with riparian ecosystems that are relatively narrow and represent a small percentage of the landscape. If habitat for the Preble's is destroyed or modified, populations in those areas will decline or be extirpated. The decline in the extent and quality of Preble's habitat is considered the major factor threatening the subspecies. Habitat alteration, degradation, loss, and fragmentation resulting from urban development, flood control, water development, agriculture, and other human land uses adversely impacts Preble's populations. Habitat destruction may impact individual Preble's directly or by destroying nest sites, food resources, and hibernation sites, by disrupting behavior, or by forming a barrier to movement (USFWS, 2002). Although urban development and agriculture, as well as most flood control actions are not authorized on BLM-administered lands, these actions become cumulative to other actions that are authorized on BLM-administered lands and add to both indirect and direct impacts that may occur to both the Preble's and associated habitats.

The conservation measures applicable to BLM-authorized actions for the Preble's meadow jumping mouse include both habitat conservation measures and species conservation measures. These measures are listed below.

Habitat Conservation Measures

Surface-disturbing and disruptive activities will be intensively managed to maintain or enhance identified potential (within 300 feet of the identified 100-year floodplain) or known habitat for the Preble's meadow jumping mouse. Intensive management may vary from year to year and includes the use of inventory, proper distance restrictions, and seasonal or timing restrictions.

In habitat suitable for the Preble's meadow jumping mouse, prescribed fire will be designed to burn no more than 25% of the Preble's habitat within each linear mile stretch of habitat. The percentage of habitat actually burned in each linear mile will be reported to the FWS. Because of the unpredictability of fire, this measure will be achieved if no more than one of every four fires exceeds the 25% limit in size. If

more than two of the first eight fires in Preble's habitat exceed 25% of the suitable habitat, the BLM will consult with the FWS to revise this standard.

Following burns in suitable habitat within the range of Preble's, on-site surveys will be conducted to determine if vegetation has recovered.

Species Conservation Measures

Surface-disturbing and other activities located within identified or known breeding habitat (within 300 feet of the identified 100-year floodplain) for the Preble's meadow jumping mouse will not be allowed between May 15 and August 15 for the protection of the mouse.

Surface-disturbing and other activities located within an identified hibernaculum area for the Preble's meadow jumping mouse will be intensively managed between August 16 and May 14 for the protection of the mouse. Intensive management may vary from year to year and includes the use of inventory and proper distance restrictions.

Best Management Practices

BLM should coordinate with other agencies and private landowners to identify voluntary opportunities to modify current land stewardship practices that may impact Preble's and its habitat.

Where needed, fence areas of high recreational use. In addition, in order to minimize human presence and its associated impacts, recreation areas should be located outside Preble's habitat.

Care should be taken to avoid the construction of fire lines through habitat. However, low to moderate intensive prescribed fire may be useful in the maintenance of Preble's habitat and prevention of catastrophic fires.

Minimize new trail, road or ROW development within 300 feet of the 100-year floodplain within the range of Preble's meadow jumping mouse. Where roads must cross riparian zones, crossings should be made at right angles of the stream. To reduce habitat fragmentation, existing roads in designated critical habitat would be reviewed for possible closure or relocation.

Preble's Meadow Jumping Mouse Critical Habitat

Listing Status: Critical Habitat identified February 2003

Species Description

Critical habitat identified specific areas, both occupied and unoccupied, that are essential to the conservation of a listed species and that may require special management considerations or protection. Critical habitat for the Preble's meadow jumping mouse (Preble's) receives protection under section 7 of the ESA through the prohibition against destruction or adverse modification of critical habitat with regard to actions carried out, funded, or authorized by a Federal agency. Section 7 also requires consultation with the USFWS on federal actions that are likely to result in the destruction or adverse modification of proposed critical habitat. Critical habitat identified by the USFWS must be essential to the conservation of the species and are areas that provide essential life cycle needs of the species. Not all areas that can be occupied by a species will be designated critical habitat. The USFWS designates those areas as critical habitat only if they are essential for that species.

Habitat is dynamic, and a species may move from one area to another over time. Designation of critical habitat may not include all habitat eventually determines as necessary to recover the species. Critical habitat designations do not signal that habitat outside the critical habitat designation is unimportant or may not be required for recovery. Areas outside the critical habitat designations will continue to be subject to conservation actions that may be implemented under section 7 and section 9 of the ESA (USFWS, 2002).

Life History

The life history of the Preble's is described above; this section discusses critical habitat, as identified and authorized by the USFWS, for the mouse. Critical Habitat is defined in Section 3(5)(A) of the ESA as: 1) the specific areas within the geographic area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features essential to conserve the species and that may require special management considerations for protection; and 2) specific areas outside the geographic area occupied by a species at the time it is listed, upon determination that such areas are essential to conserve the species. The USFWS defines conservation as the use of all methods and procedures that are necessary bring an endangered or threatened species to the point at which listing under the ESA is no longer necessary (USFWS, 2002).

Population Distribution

Critical habitat units include only river and stream reaches, and adjacent floodplains and uplands, that are within the known geographic and elevational range of the Preble's, have the primary constituent elements present, and based on the best available scientific information, are believed to currently support the Prebles'. In Wyoming and at higher elevations along the Front Range in Colorado, the geographic distribution of the Preble's has been subject to scrutiny due to the close resemblance, and apparent range overlap between the Preble's and the western jumping mouse. At this time, new information has not appreciably changed the known range of the Preble's. Presence of Preble's was determined based largely on the results of trapping surveys, with the majority of these conducted over the past six years.

The USFWS considered several qualitative criteria to judge the current status and probable persistence of Preble's in the area and proposal of specific areas as critical habitat. The criteria included: 1) the quality, continuity, and extent of habitat components present; 2) the state of hydrological processes that maintain and rejuvenate suitable habitat components; 3) the presence of land devoted to conservation (public lands, parks, open space, and/or private lands under conservation agreements); and 4) the landscape context of the site, including human disturbance and future development. The USFWS reviewed drainages within the North Platte River drainage, South Platte River drainage, and Arkansas River drainage. The RFO proposed projects may be located in habitat that may affect both the North Platte River and South Platte River drainages (USFWS, 2002).

Field Office Distribution

At this time there is no identified Critical Habitat for the Preble's Meadow Jumping Mouse located on BLM administered lands within the RMPPA.

The recovery criteria calls for one large and two medium recovery populations within the North Platte River basin and three small or one medium recovery populations within the South Platte River basin likely to support Preble's. These populations could be located inside or outside of the RFO.

The North Platte River drainage riparian areas that are located within the RFO include portions of Cottonwood Creek and Chugwater Creek recovery population areas. The USFWS identified Cottonwood

Creek and its tributaries, including Kloer Creek, North Cottonwood Creek, and Preacher Creek, as critical habitat for the Preble's. These creeks are located near the junction of Converse, Albany, and Platte Counties. The USFWS identified the Chugwater Creek drainage as critical habitat consistent with one large recovery population. Chugwater Creek, unnamed tributaries, as well as Strong Creek, Shanton Creek, and Ricker Creek tributaries are identified as critical habitat for the Preble's.

The South Platte River drainage riparian areas that are located within the RFO include portions of the Lodgepole Creek drainage recovery population areas. The complex contains critical habitat and is consistent with two of the three small recovery populations for the South Platte River drainage. The South Branch of Middle Lodgepole Creek, the North Branch of Middle Lodgepole Creek, Middle Lodgepole Creek, North Lodgepole Creek, and Lodgepole Creek are identified as critical habitat.

Reproduction and Survivorship

Information on the reproduction and survivorship of the Preble's meadow jumping mouse is identified above in the Preble's meadow jumping mouse section of this BA.

Management Status Recovery and Conservation Planning

The regulations identified in the Federal Register Volume 68, Number 120, Monday, June 23, 2003, Rules and Regulations will be followed concerning management status recovery and conservation planning for activities that are located, or have the potential to be located, within critical habitat for the Preble's meadow jumping mouse.

Habitat Conservation Measures

Surface-disturbing and disruptive activities will be intensively managed to maintain or enhance designated critical habitat for the Preble's meadow jumping mouse. Intensive management may vary from year to year and includes the use of inventory, proper distance restrictions, and seasonal or timing restrictions.

Species Conservation Measures

Surface-disturbing and other activities located within identified or known breeding habitat (within 300 feet of the identified 100-year floodplain) within critical habitat for the Preble's meadow jumping mouse would not be allowed between May 15 and August 15 for the protection of the mouse.

Surface-disturbing other activities that are located within an identified hibernaculum area in critical habitat for the Preble's meadow jumping mouse will be intensively managed between August 16 and May 14 for the protection of the mouse. Intensive management may vary from year to year and includes the use of inventory and proper distance restrictions.

Best Management Practices

In critical habitat, conduct a survey before beginning any potential disturbing activities.

BLM should coordinate with other agencies and private landowners to identify voluntary opportunities to modify current land stewardship practices that may impact Preble's and its critical habitat.

Where needed, fence areas of high recreational use. In addition, in order to minimize human presence and its associated impacts, recreation areas should be located outside critical habitat for the Preble's.

Care should be taken to avoid the construction of fire lines through critical habitat. However, low to moderate intensive prescribed fire may be useful in the maintenance of critical habitat for the Preble's and prevention of catastrophic fires.

Minimize new trail, road or ROW development within 300 feet of the 100-year floodplain within the critical habitat for the Preble's meadow jumping mouse. Where roads must cross riparian zones, crossings should be made at right angles of the stream. To reduce habitat fragmentation, existing roads in designated critical habitat will be reviewed for possible closure or relocation.

Maintain and restore the dynamics of stream systems, both within and upstream of critical habitat, to benefit critical habitat for the Preble's jumping mouse, including the movement of streams within their floodplains. This habitat should be considered when designing bank stabilization, channelization, straightening riparian channels, and rip-rap projects.

Canada lynx (*Lynx canadensis*)

Listing Status: Federal - Threatened

The Canada lynx (hereafter referred to as "lynx") was listed as a federally "threatened" species on April 24, 2000 pursuant to the ESA (the Act). Critical Habitat has not been designated. A civil suit has been filed in Federal District Court against the USFWS for not designating Critical Habitat for lynx. Depending on the Court ruling in this matter, the issue of Critical Habitat may be readdressed at a later date.

A Biological Assessment of the Effects of National Forest Land and Resource Management Plans and Bureau of Land Management Land Use Plans on Canada Lynx (Canada Lynx BA) (Hickenbottom et al. 1999) was prepared and submitted to the USFWS in December 1999. An Interagency Lynx Biology Team was selected to prepare the Canada Lynx Conservation Assessment Strategy (LCAS) which was completed in January 2000. The USFWS then issued a Biological Opinion (BO) in October 2000.

Species Description

The lynx is a medium-sized cat with long legs, large well-furred paws, long tufts on the ears, and a short, black-tipped tail (McCord and Cardoza 1982). Adult males weigh an average of 22 pounds and are generally 33.5 inches in length (head to tail); females average 19 pounds and are generally 32 inches in length (Quinn and Parker 1987). The long legs and large feet of the lynx make this cat highly adapted for hunting in deep snow.

The bobcat (*Lynx rufus*) is a North American relative of the lynx. Compared to the lynx, the bobcat has smaller paws, shorter ear tufts, and a more spotted pelage (coat), and only the top of the tip of the tail is black. The paws of the lynx have twice the surface area as those of the bobcat (Quinn and Parker 1987). The lynx also differs in its body proportions in comparison to the bobcat. Lynx have longer legs, with hind legs that are longer than the front legs, giving the lynx a "stooped" appearance (Quinn and Parker 1987). Bobcats are largely restricted to habitats where deep snows do not accumulate (Koehler and Hornocker 1991).

Life History

In the contiguous United States, the distribution of the lynx is associated with the southern boreal forest, comprised of sub-alpine coniferous forest in the west (Aubry et al. 2000). At its southern margins, the boreal forest becomes naturally fragmented into patches of varying size as it transitions into other vegetation types. These southern boreal forest habitat patches are small relative to the extensive northern

boreal forest, which constitutes the majority of the lynx range. Many of these southern boreal forest patches are able to support resident populations of lynx and their primary prey species, the snowshoe hare (*Lepus americanus*). It is likely that some of the habitat patches act as sources where lynx recruitment is greater than mortality and lynx are able to disperse and potentially colonize other patches (McKelvey et al. 2000). Other habitat patches act as “sinks” where lynx mortality is greater than recruitment and lynx are lost from the overall population. The ability of naturally dynamic habitat to support lynx populations may change as the habitat undergoes natural succession following natural or manmade disturbances (i.e., wildland fire, timber harvesting).

Lynx use large woody debris, such as downed logs and windfalls, to provide denning sites with security and thermal cover for kittens (McCord and Cardoza 1982; Koehler 1990; Koehler and Brittell 1990; Squires and Laurion 2000). For lynx den sites, the age of the forest stand does not seem as important as the amount of downed, woody debris available (Mowat et al. 2000). A den site in Wyoming was located in a mature subalpine fir/lodgepole pine forest with abundant downed logs and a high amount of horizontal cover (Squires and Laurion 2000).

The size of lynx home ranges varies by the animal’s gender, abundance of prey, season, and the density of lynx populations (Koehler 1990; Poole 1994; Slough and Mowat 1996; Aubry et al. 2000; Mowat et al. 2000). Preliminary research supports the hypothesis that lynx home ranges at the southern extent of the species’ range are generally large compared to those in the northern portion of the range (Koehler and Aubry 1994; Squires and Laurion 2000).

Lynx are highly specialized predators that have evolved to survive in areas that receive deep snow (Bittner and Rongstad 1982). Snowshoe hares use forests with dense understories that provide forage, cover to escape from predators, and protection during extreme weather (Wolfe et al. 1982; Monthey 1986; Hodges 2000). Generally, earlier successional forest stages have greater understory structure than do mature forests and therefore support higher hare densities (Hodges 2000). However, mature forests also can provide snowshoe hare habitat as openings develop in the canopy when trees succumb to disease, fire, wind, and the understory grows (Buskirk et al. 2000). Lynx concentrate their hunting activities in areas where hare activity is relatively high (Koehler et al. 1979; Parker 1981; Ward and Krebs 1985; Major 1989; Murray et al. 1994).

The association between lynx and snowshoe hare is considered a classic predator-prey relationship (Saunders 1963; van Zyll de Jong 1966; Quinn and Parker 1987). Generally, researchers believe that when hare populations are at their cyclic high, depletion of food resources exacerbated by predation cause hare populations to decline drastically (Buehler and Keith 1982; Krebs et al. 1995; O’Donoghue et al. 1997). Snowshoe hare provide the quality prey necessary to support high-density lynx populations (Brand and Keith 1979). Lynx also prey opportunistically on other small mammals and birds, particularly when hare populations decline (Nellis et al. 1972; Brand et al. 1976; McCord and Cardoza 1982). Red squirrels (*Tamiasciurus hudsonicus*) are an important alternate prey (O’Donoghue 1997; Aubry et al. 1999; Apps 2000). However, a shift to alternate food sources may not compensate for the decrease in hares consumed (Koehler and Aubry 1994). Koehler (1990) suggested that a diet of red squirrels alone might not be adequate to ensure lynx reproduction and survival of kittens.

Relative snowshoe hare densities at southern latitudes are generally lower than those in the north, which has led to differing interpretations of population dynamics of snowshoe hare populations. Snowshoe hares are generally associated with conifer forest cover types (Hodges 2000). In the southern boreal forest, relatively low snowshoe hare densities are likely a result of the naturally patchy, transitional boreal habitat that prevents hare populations from achieving densities similar to those of the expansive northern boreal forest (Wolff 1980; Buehler and Keith 1982). Additionally, the presence of more predators and

competitors of hares at southern latitudes may inhibit the potential for high-density populations with extreme cyclic fluctuations (Wolff 1980).

Population Distribution

The complexities of lynx life-history and population dynamics, combined with a general lack of reliable historic and current lynx data for the contiguous United States make it difficult to ascertain the past or present population status of lynx. Because of the naturally fragmented habitat and lower density hare populations in the contiguous United States, lynx are expected to occur at naturally lower densities than in the north.

Historic lynx data in the contiguous United States are scarce and exist primarily in the form of trapping records. Many states did not differentiate between bobcats and lynx in trapping records. Therefore, long-term lynx trapping data are not available for most states. Surveys designed specifically for lynx were rarely conducted, and many reports (e.g., visual observations, snow tracks) of lynx were collected incidental to other activities. The reliability of many of these records is unknown; trapping records may have errors, track identification is extremely difficult, and observations may be wrong.

Within the contiguous United States, the lynx range extends into different regions that are separated from each other by ecological barriers consisting of unsuitable lynx habitat. Wyoming lies within the Northern Rocky Mountains/Cascades region. Most historical and recent records of lynx in Wyoming are from the northwestern mountain ranges (Reeve et al. 1986; McKelvey et al. 2000). McKelvey et al. (2000) found only 30 verified records statewide since 1856. Until 1957, lynx had bounties placed on them. After 1973, the lynx was listed as a protected non-game species and harvest was closed.

In 1996, the WGFD began a lynx study in west-central Wyoming. Kittens were documented in 1998 (Squires and Laurion 2000). This may indicate the presence of a resident population in this local area (Ruggiero et al. 2000). However, using available information the status or trend of lynx throughout Wyoming was not possible. A radio-collared female, which produced the previously noted kittens, died of starvation in the winter of 2000. A radio-collared male lynx (who died of starvation in the winter of 2002) was documented to travel the area from the northern Bridger Teton National Forest to the lower extent of the Wyoming Range (Laurion and Oakleaf 1998). Other lynx have been documented in Wyoming, including Yellowstone National Park (YNP) (Reeve et al. 1986).

Field Office Distribution

The presence of lynx is unlikely in the planning area due to the lack of suitable habitat (spruce/fir/late-seral conifer forest on slopes of 8-12 degrees and no denning sites on or adjacent to BLM-lands), poor abundance of its principle prey, the snowshoe hare and secondary prey, the red squirrel, and possibly the level of human disturbance (NPS 2000; Ruediger et al. 2000; Beauvais et al. 2001). Within the identified forest type, lynx are most likely to persist in areas that receive deep snow (Ruggiero et al. 2000); this snow condition is lacking in the Rawlins Field Office planning area where the total annual snowfall is about 4 feet (1.22 m) and the mean monthly snowfall ranges from 10 to 20 inches (.254 to .508 m) (Western Regional Climate Center). The RFO BLM lands are not in a designated Lynx Analysis Unit (LAU) and no permanent populations of lynx are known to exist within the Field Office.

Lynx may use riparian areas throughout the planning area as travel corridors between suitable habitats found in adjoining forests. Two radio-collared lynx, from a research study population in Colorado, have been documented in the southern portion of the RFO area, in the Sierra Madre mountain range

Reproduction and Survivorship

The availability of prey can influence the time of first breeding; if forage is plentiful, then breeding may begin at one year of age. Otherwise, two years of age is more common (Ruediger et al. 2000; WI-DNR undated). Breeding occurs from January or February in the southern region, to March or April in the north. Gestation is 60-65 days and litters generally range from 1-4 kittens whose eyes remain closed for 8-10 days post-partum. The male does not tend to the kittens (Eisenburg 1986; Ruediger et al. 2000; WI-DNR undated). Fecundity and kitten survival also appears to have a relationship to prey status (Ruediger et al. 2000).

In northern study areas during the low phase of the hare cycle, few if any kittens are born, and few yearling females conceive. In the far north, some lynx recruitment occurs when hares are scarce and this may be important in lynx population maintenance during low hare cycles. During periods of hare abundance in the northern taiga, litter size of adult females averages 4 to 5 kittens (Ruediger et al. 2000).

Reported causes of lynx mortality vary between studies. The most commonly reported causes include starvation of kittens and human-caused mortality (fur trapping). Various studies in the northern taiga have shown that, during periods of low snowshoe hare numbers, starvation can account for up to two-thirds of all natural lynx deaths. Trapping mortality may be additive rather than compensatory during the low period of the snowshoe hare cycle. Hunger-related stress, which induces dispersal, may increase the exposure of lynx to other forms of mortality such as trapping and highway collisions. Predation on lynx by mountain lion, coyote, wolverine, gray wolf, and other lynx has been documented and confirmed (Ruediger et al. 2000).

Management Status Recovery and Conservation Planning

In August 2000, the BLM and USFWS signed a Canada Lynx Conservation Agreement. The intent of this Agreement is to: (1) coordinate assessment and planning efforts between the two agency signatories and with other appropriate entities (e.g. USFS, NPS, State and Tribal agencies) to assure a comprehensive approach to conserving lynx; (2) use the Science Report and Lynx Conservation Assessment and Strategy (LCAS) (Ruediger et al. 2000), together with locally specific information as appropriate as the basis for these actions; (3) use the Science Report and LCAS, together with locally specific information as appropriate, as the basis for streamlining ESA Section 7 consultation between the BLM and USFWS; and (4) utilize the best available scientific and commercial data during the Section 7 consultation process. The Conservation Agreement specifies that, “the LCAS will be used and referenced in all determinations of effect for lynx.” (Federal Register 50 CFR Part 17, Endangered and Threatened Wildlife and Plants, Determination of Threatened Status for the Contiguous U.S. Distinct Population Segment of the Canada Lynx and Related Rule, Final Rule; Federal Register: March 24, 2000 (Volume 65, Number 58) Page 16051-16086; and the LCAS) (Ruediger et al. 2000).

Conservation measures are binding measures BLM shall implement in order to facilitate the conservation of lynx. LAUs typically encompass both lynx habitat (may or may not be in suitable condition) and other areas (such as lakes, low elevation ponderosa forest and alpine tundra). These conservation measures generally only apply to habitat within LAUs. However, their use in areas of potential habitat not fitting the criteria of a LAU is encouraged. At this time, there are no LAUs identified within the RFO area. There is the potential for lynx to cross the RFO area traveling from one LAU to another.

Habitat and Species Conservation Measures

Where lynx are documented to occur, BLM will initiate coordination with the Service at the earliest possible date so that the USFWS can advise on project design. This should minimize the need to redesign

projects at a later date to include Canada lynx conservation measures, determined as appropriate by the USFWS.

Best Management Practices

Where applicable on BLM-administered lands, key linkage riparian travel corridors should be enhanced or maintained, using the U.S. Forest Service guidelines when possible.

Evaluations should be made on BLM-administered public lands adjacent to identified lynx habitat to determine whether fire suppression, forest type conversions, and other forest management practices have altered, or have the potential to alter, fire regimes and the functioning of forest ecosystems. Fire management practices should be adjusted where needed to produce forest composition, structure, and patterns more similar to those that would have occurred under historical succession and disturbance regimes, and would not negatively impact the Canada lynx. Chemical treatments would be considered when beneficial to habitat composition and structure.

Provide for habitat conditions through time that support dense horizontal understory cover, and high densities of snowshoe hares. This includes, for example, mature multi-storied conifer vegetation, and vegetation management, including timber harvest and use of prescribed fire to increase dense horizontal cover. Design regeneration prescriptions to mimic historical fire (or other natural disturbance) events, including retention of fire-killed trees and coarse woody debris.

Consider improvement harvests (commercial thinning, selection, etc.) to provide additional denning and foraging habitat. Improvement harvests should be designed to retain and recruit the understory of small diameter conifers and shrubs preferred by hares, as well as coarse woody debris, and maintain or improve the juxtaposition of denning and foraging habitat.

Burn prescriptions should be designed to retain or encourage shrub and tree species composition and structure that will provide habitat for snowshoe hares, red squirrels, or other alternate prey species. In situations where objectives can still be met, design treatments and fire suppression actions to maximize lynx denning habitat.

Map and monitor the location and intensity of snow compacting activities (for example, snowmobiling, snowshoeing, cross-country skiing, dog sledding, etc.) that coincide with lynx habitat, to facilitate future evaluation of effects on lynx as information becomes available. As this information becomes available, the types of activities which cause snow-compaction resulting in compromised lynx habitat should be limited or discouraged. Provide, where possible, a landscape with interconnected blocks of foraging habitat.

Work cooperatively and proactively with the WGFD and other agencies to reduce incidental take of lynx related to trapping and to ensure that important lynx prey are conserved, and provide for unified management direction via habitat conservation plans, conservation easements or agreements, and land acquisitions.

To reduce mistaken shooting of lynx, initiate and/or augment interagency information and education efforts throughout the range of lynx in the contiguous states. Utilize trailhead posters, magazine articles, news releases, state hunting and trapping regulation booklets, etc. to inform the public of the possible presence of lynx, field identification, and their status.

Identify, map, and prioritize site-specific locations, using topographic and vegetation features, to determine where highway crossings are needed to reduce highway impacts on lynx, and where needed,

develop protection measures such as wildlife fencing and associated underpasses or overpasses to reduce mortalities related to those potential lynx crossings.

Dirt and gravel roads traversing lynx habitat (particularly those that could become highways) should not be paved or otherwise upgraded (e.g., straightening of curves, widening of roadway, etc.) in a manner that is likely to lead to significant increases in traffic volumes, traffic speeds, increased width of the cleared ROW, or would foreseeably contribute to development or increases in human activity in lynx habitat. Whenever rural dirt and gravel roads traversing lynx habitat are proposed for such upgrades, a thorough analysis should be conducted on the potential direct and indirect effects to lynx and lynx habitat.

Determine where high total road densities (>2 miles per square mile) coincide with lynx habitat, and prioritize roads for seasonal restrictions or reclamation in those areas.

Minimize building of roads directly on ridgetops or areas identified as important for lynx habitat connectivity, and close newly constructed roads (e.g., for access to mines, leases, or timber harvest) in lynx habitat to limit public use during project activities. This requires the design of new roads, especially near forest entrances, to allow for effective closure upon completion of sale activities, and/or upon project completion, reclaim and obliterate roads.

Using best available science, develop a plan to identify and protect key linkage areas on federal lands from activities that would create barriers to movement. Barriers could result from an accumulation of incremental projects, as opposed to any one project. Where feasible, within identified key linkage areas, maintain or enhance native plant communities and patterns, and habitat for potential lynx prey species.

Identify and protect potential security habitats in and around proposed developments or expansions.

Bald Eagle (*Haliaeetus leucocephalus*)

Listing Status: Federal - Threatened

Species Description

The bald eagle has a conspicuous white head and tail, a blackish-brown back and breast, and yellow feet and bill. The distinctive white plumage on the head and tail, for which the species is named, is not attained until five or more years of age. The female bald eagle is approximately 35 to 37 inches (.89 to .94 m) long with a wingspan from 79 to 90 inches (2.1 to 2.28 m). The male bald eagle is slightly smaller than the female, with a body length of 30 to 34 inches (.76 to .86 m) and a wingspan of 72 to 85 inches (1.8 to 2.2 m). Wild bald eagles may live as long as 30 years, but the average lifespan is probably about 15 to 20 years.

Life History

Bald eagles are found usually near large rivers, streams, and lakes. Habitat consists of nesting habitat, communal winter roosting habitat, and foraging habitat that is located in some areas within the RFO area.

Nesting Habitat

Bald eagles are found primarily along surface water sources (e.g., rivers, lakes, coasts) where their nests are usually located in large trees. They often use and rebuild the same nest each year, which is typically about five feet in diameter. Nest trees are usually close to water, afford a clear view of the surrounding area, and often provide sparse cover above the nest.

Communal Winter Roosting Habitat

During winter, bald eagles congregate near rivers and reservoirs with open water and often near large concentrations of waterfowl. Wintering eagles usually occupy river habitats between mid-November and late-April and use large cottonwoods, poplars, and other riparian trees as daytime perches and night roosts. They usually perch within a riparian corridor or along lakeshores and prefer areas with limited human activity.

Concentrated Foraging Habitat

Feeding areas, diurnal perches, and night roosts are fundamental elements of bald eagle winter range. Wintering bald eagles primarily occur where all three of these elements are in close proximity, although they will fly up to 15 miles where these elements are sparsely distributed across the landscape (Swisher 1964).

Food availability is probably the single most important factor affecting winter bald eagle distribution and abundance (Steenhof 1976). Fish and waterfowl are the primary sources of food for bald eagles, but they will also feed on carrion, rabbits, and other small rodents. The hunting area or home range patrolled by a bald eagle varies from 1,700 to 10,000 acres (688 to 4047 hectares). Home ranges are smaller where food is present in great quantity.

Population Distribution

Bald eagles occur over most of North America at some time during the year, and breed across at least half of the continent. The largest populations occur in the Pacific Northwest, western Canada, and southern Alaska.

Field Office Distribution

There are forty bald eagle nests located within the RFO. It should be noted that most of the distribution of bald eagles is confined to riparian and adjacent upland habitats.

Nesting Habitat

Forty bald eagle nests are currently known to occur within the RFO (Apple 2002; Redder 2002; Van Fleet 2002); however, it should be noted that these nests are located on private, state, and federal lands. The status/current use of several of these nests is not known. Twenty-nine nests are located on privately owned lands, six are on lands administered by BLM, and five nests are located on lands administered by other federal agencies. The majority of these known nests are located in riparian habitats associated with the North Platte, Encampment, and Little Snake Rivers.

Communal Winter Roosting Habitat

There are two communal winter roost sites located within the RFO (Apple 2002; Redder 2002; Van Fleet 2002). One communal winter roost site occurs in riparian habitat associated with the Little Snake River. There is another communal winter roost site located within the Pedro Mountains along the North Platte River.

Concentrated Foraging Habitat

No concentrated foraging habitats, such as ice-free water bodies, crucial big game ranges with high winter mortality (e.g., starvation or vehicle collisions) or cattle or sheep stockyards are known to exist in the FO

(Apple 2002). General foraging habitats associated with rivers, streams, lakes, reservoirs, and open, upland habitats occur in the RFO and are suitable foraging areas for bald eagles when they support sufficient populations of prey.

Reproduction and Survivorship

Breeding for bald eagles typically begins in February or March, and the female eagle lays a clutch ranging from one to three eggs in March or April. Both the male and female incubate the eggs for about 35 to 40 days, resulting in usually one or two eaglets produced by the pair (Stalmaster 1987). Young eagles remain in the nest for about 75 days. After the breeding season, bald eagles congregate where food is plentiful, and they may continue to roost near the nest tree.

Management Status Recovery and Conservation Planning

There are several measures included in the existing Rawlins/Great Divide RMP that have been utilized over the years to directly or indirectly minimize impacts to the bald eagle. These actions included timing restrictions for surface-disturbing activities and intensive management in specific areas. Existing protection measures included the following: (1) objectives for the Jep Canyon ACEC and Shamrock Hills ACEC stated that surface-disturbing activities would be intensively managed to maintain the productivity of nesting raptor pairs; (2) in Habitat Management Areas (HMPs), Cooperative Management Areas and other portions of the planning area, site specific management actions would be implemented to improve wildlife habitat; this included 271,000 acres (109,674 hectares) of raptor habitat; (3) surface-disturbing activities would be intensively managed in all raptor concentration areas to reduce physical disturbance of raptor habitat and disturbance of the birds, while allowing for development of coal and oil and gas, and to seek the cooperation of owners of adjacent property in management of raptor nesting habitat. In addition, the BLM would consider consolidating public land to obtain important wildlife habitat areas such as raptor concentration areas; (4) to protect important raptor nesting habitat, activities or surface use would not be allowed from February 1 through July 31 within certain areas encompassed by the authorization. The same criteria apply to defined raptor winter concentration areas from November 15 through April 30; (5) prior to conducting any onsite activities, inventories or studies would be required in accordance with BLM and USFWS guidelines to verify the presence or absence of raptors; and (6) for the protection of nesting eagles and prairie falcons and their associated buffer zones, no surface operations will be allowed in such areas as long as the USFWS determines that nest viable.

The following habitat conservation measures and species conservation measures will be implemented within the RFO in areas where there is the potential for the bald eagle to occur in nesting, communal winter, and/or foraging habitat.

Habitat Conservation Measures

Surface-disturbing activities that may affect bald eagle habitat will be intensively managed in all Raptor Concentration Areas (RCAs) to reduce physical disturbance of bald eagle habitat and disturbance of the birds. This will entail a case-by-case examination of proposals to determine potential effects and appropriate mitigation to minimize adverse effects to bald eagles and their habitat. Intensive management may vary from year to year and includes the use of inventory, proper distance restrictions, and seasonal or timing restrictions.

RCAs will be open to oil and gas leasing and a plan of operations (BLM 3809) will be required for disturbances regardless of the number of acres that will be disturbed for the protection of bald eagles.

BLM-administered lands that are within 1 mile of an integral part of bald eagle habitats, including nests, communal winter roosts, and foraging/concentration areas, will not be exchanged or sold.

Species Conservation Measures

Surface-disturbance or disruptive activities potentially disruptive to nesting bald eagles will be prohibited within one mile of a bald eagle nest during the period of February 1 and July 15 for the protection of nesting areas.

In addition, minimal human activities and habitat alterations, as defined in Appendix II and Appendix Table F-2 of the Programmatic Statewide Bald Eagle Biological Assessment (see BLM 2003), that may disturb bald eagles will be restricted within suitable habitats that occur within bald eagle buffer zones. Deviations may be made after consultation with the USFWS.

Zone 1: (within ½ mile February 1 to August 15) is intended to protect active and alternative nests. For active nests, minimal human activity levels are allowed during the period of first occupancy to two weeks after fledging.

Zone 2: (within ½- 1 mile from the nest February 1 to August 15) is intended to protect bald eagle primary use areas and permits light human activity levels.

Zone 3: is designated to protect foraging/concentration areas year-round. This zone would include one of two larger areas, depending on habitat types:

- a. 2.5 miles extending in all directions from the nest;
 - b. ½ mile from the streambank of all streams within 2.5 miles of the nest. Site-specific habitat types and foraging areas will be evaluated to determine which Zone 3 buffer applies. Zone delineation depends on habitat types. Exceptions may be made after consultation with the USFWS.
- 2) Surface-disturbing or disruptive activities potentially disruptive to a bald eagle communal roost will be prohibited within two miles of the communal roost during the period of February 1 and July 15 for the protection of communal roost areas. A communal roost is defined as an area usually less than ten acres in size that contains, or has contained, ≥ 6 bald eagles on any given night. When required, the BLM will develop a site management plan (in cooperation with the USFWS) to identify potential impacts to active bald eagle nests and/or communal roost sites.
 - 3) Surface-disturbing or disruptive activities potentially disruptive to identified bald eagle communal winter roost sites will be prohibited within one mile of the winter roost site between November 1 and April 1 for the protection of wintering bald eagles.
 - 4) No ground disturbing activities will be permitted within ½ mile of active bald eagle communal winter roost sites year-round. This buffer zone restriction may be adjusted based on site-specific information through coordination with, including written concurrence, the USFWS Wyoming Field Office.
 - 5) Well locations, roads, and ancillary facilities, and other surface structures requiring a repeated human presence, will not be allowed within 1200 feet of active bald eagle nests. The distance may vary depending on factors such as nest activity, natural topographic barriers, and line-of-sight distance.

Appropriately timed surveys in bald eagle habitats will be conducted prior to any activities and subsequent authorization of activities that may disturb bald eagles or their habitats. A qualified biologist would be approved by the BLM to conduct such bald eagle surveys. All nest surveys should be conducted using standard procedures that minimize the potential for adverse effects to nesting raptors. In the event species occurrence is verified, the proponent may be required to modify operational plans, at the discretion of the authorized officer, to include the appropriate measures for minimization of effects to the bald eagle and its habitat.

BLM will monitor and restrict, when and where necessary, authorized or casual use activities that may adversely impact bald eagles or their habitat, including, but not limited to, recreational mining and oil and gas activities. Monitoring results should be considered in the design and implementation of future projects.

Each year, BLM will verify the status (active vs. inactive) of known bald eagle nests, communal winter roosts, and concentration areas on lands administered by the BLM within the RMP area. As a matter of maintaining inventory information, the BLM will coordinate annually with USFWS, WGFD, and other appropriate entities to determine the status of known and new bald eagle nests, communal winter roosts, and other concentration areas. Known bald eagle nests, communal winter roosts, and concentration areas will be assumed active if status has not been verified.

To monitor the impacts of site-specific projects authorized under the RMP, that are likely to adversely affect bald eagles, the BLM will prepare a report describing the progress of each such site-specific project, including implementation of the associated reasonable and prudent measures, and impacts to the bald eagle (50 C.F.R. § 402.14[i][3]). The report, which will be submitted annually to the USFWS, Wyoming Field Office, by January 1 beginning after first full year of implementation of the Proposed Action, shall list and describe: (a) adverse effects resulting from activities of each site-specific project; (b) when and if any level of anticipated incidental take is approached (as allowed by separate Incidental Take Statements from site-specific formal consultation); (c) when and if the level of anticipated take (as allowed by separate Incidental Take Statements from site-specific formal consultations) is exceeded; and (d) results of annual, periodic monitoring which evaluates the effectiveness of the reasonable and prudent measures. This will include items such as: (i) assessment of whether implementation of each site-specific project is consistent with that described in the Biological Assessment; (ii) compliance with terms and conditions; and (iii) documentation of sightings of bald eagles during activities of each site-specific project.

Best Management Practices

Best Management Practices (BMPs) would be applied to surface-disturbing and disruptive activities to maintain or enhance bald eagles and their habitats.

Proponents of BLM authorized actions should be advised that roadside carrion can attract foraging bald eagles and potentially increase the risk of vehicle collisions with bald eagles feeding on carrion. When large carrion occurs on the road, appropriate officials should be notified for necessary removal.

BLM should coordinate with APHIS – Wildlife Services Division to minimize potential impacts to the bald eagle and its habitats from pest/predator control programs that may be included in the local animal damage control plan. USFWS should also be included in this coordination.

Proposed and future water projects should not be designed to discharge into drainages or reservoirs occurring within 500 feet of county roads and highways. This measure is intended to minimize vehicle collisions with wildlife using the water source and subsequent eagle-vehicle collision.

BLM should provide educational information to project proponents and the general public pertaining to the following topics: appropriate vehicle speeds and the associated benefit of reduced vehicle collisions with wildlife; use of lead shot (particularly over water bodies); use of lead fishing weights; and the general ecological awareness of habitat disturbance.

BLM should coordinate with other agencies and private landowners to identify voluntary opportunities to modify current land stewardship practices that may impact the bald eagle and its habitats.

BLM should periodically review existing water quality records (e.g., WDEQ, WGFD, USGS, etc.) from monitoring stations on, or near, important bald eagle habitat (i.e., nests, roosts, concentration areas) on public land for any conditions that could potentially adversely affect the species. If water quality problems are identified, the BLM should contact the appropriate jurisdictional entity to cooperatively monitor the condition and/or take corrective action.

Western Yellow-billed Cuckoo (*Coccyzus americanus*)

Listing Status: Federal Candidate

Species Description

The western population of the yellow-billed cuckoo (cuckoo) is a slender, long-tailed, robin-sized bird, about 12 inches long, with a moderately long, down-curved bill. It is brownish gray in color with white under-parts and a striking yellow base of the lower mandible, for which the species is named. The outer tail feathers have distinctive broad white tips, giving the appearance of six large white spots on the underside.

Life History

Cuckoos are primarily found in open, streamside deciduous woodland with low, scrub vegetation. They generally prefer large tracts of deciduous riparian woodlands; cottonwood stands for foraging and willow thickets for nesting. They also require relatively large riparian tracks below 7,000 feet (2,134 m) for breeding, which is severely limited in Wyoming (WYNDD 2002). Canopy cover of at least 50% in both the under-story and over-story is preferred according to habitat models established for the western population. Cuckoos generally are absent from heavily forested and urban areas.

Although more than 75 percent of the cuckoo's diet comprises grasshoppers and caterpillars, they have been known to eat beetles, cicadas, wasps, flies, lacewings, mosquito hawks, and other insects. They have also been known to take eggs and the young of other birds. Sometimes they will eat small fruits and nuts.

Population Distribution

The cuckoo formerly ranged across southern Canada, the United States, and northern Mexico. It has been nearly extirpated in the West and is restricted to small isolated populations. It is considered extremely rare in the Northern Rockies and Great Plains. An estimated 90 percent of the bird's riparian habitat in the West has been destroyed or degraded as a result of human activity (e.g., conversion to agriculture, dams and river flow management, bank protection, overgrazing, and competition from exotic plants such as tamarisk) (Laymon 1987, 2000; Hughes 1999). The species is no longer found in British Columbia, Washington, Oregon, or Nevada.

Little is known about the historic distribution of cuckoos in Wyoming; there have been relatively few reported observations. Breeding pairs may be found in the Green River and Powder River basins, along

the North Platte River to Casper, and along the Henry's and Black's Fork Rivers. One observation of the cuckoo in 1994 was made at Seedskaadee National Wildlife Refuge, which is west of the planning area.

Field Office Distribution

Within the planning area, the type of habitat the cuckoo prefers is severely limited. These areas would be confined to cottonwood-willow riparian habitats west of the Continental Divide. This would be primarily in the Little Snake River basin.

Reproduction and Survivorship

Cuckoos arrive on their western breeding grounds in mid-June and leave for South America by late August. Breeding often coincides with the appearance of large numbers of spring insects. Cuckoos have the shortest combined incubation/nesting period of any bird species. Clutch size usually ranges between three and five, and both males and females share egg incubation. Though unable to fly, the newly fledged young are adept crawlers, traveling up to 150 feet (45.7 m) on their first day out of the nest. After 3 to 4 weeks, they are able to begin their migration to South America (Center for Biological Diversity 2002).

Mating of cuckoos begins with the female raising and lowering her tail several times when a male is nearby. The male then snaps off a twig and brings it to her, landing directly on her back. The male places the twig crosswise in the female's bill at which point copulation begins, and ends seconds later.

Management Status Recovery and Conservation Planning

The following habitat conservation measures and species conservation measures will be implemented within the RFO in areas where there is the potential for the western yellow-billed cuckoo to occur in nesting and/or foraging habitat.

Habitat Conservation Measures

Surface disturbing activities would be avoided within 500 feet of perennial waters and wetland/riparian areas for protection of Western yellow-billed cuckoo and identified habitat.

Boat and raft landing areas will not be developed, and outfitting camps will not be permitted, in western yellow-billed cuckoo habitat.

Species Conservation Measures

Surface-disturbing or disruptive activities will be prohibited within ½-mile of identified habitat during the period of April 15 to August 15 for the protection of nesting western yellow-billed cuckoos.

Best Management Practices

Best Management Practices (BMP) would be applied to surface-disturbing and disruptive activities to maintain or enhance the western yellow-billed cuckoo and their habitats.

Incorporate yellow-billed cuckoo habitat guidelines into livestock Standards and Guidelines assessments.

Where possible, biological control of pests would be used rather than chemical control. Where needed, pesticide use would be applied by hand within ¼ mile of cuckoo habitat and only in cases where insect or weed outbreaks have the potential to degrade area ecological health. Outside the ¼ mile buffer, aerial application of pesticides would be carefully planned to prevent drift. The BLM shall work with APHIS

and the USFWS to select a pesticide and method of application that will most effectively manage the infestation and least affect the western yellow-billed cuckoo.

Ensure adequate livestock practices in order to protect yellow-billed cuckoo habitat. These include, but are not limited to placement of salt and mineral blocks, livestock water locations, fencing, livestock handling facilities, and season of use.

All high quality riparian areas of 20 hectares or more shall be managed to preserve, protect, and, if necessary, restore natural functions to minimize degradation of stream banks and the loss of riparian habitat.

When necessary or required, fence known occupied cuckoo habitat to exclude or shorten the duration of livestock use where livestock grazing is determined to impede regeneration of the habitat. This will stabilize and protect eroding stream banks in cuckoo habitat.

Avoid building roads or new trails parallel to streams in riparian zones or through wet meadows that have the potential, or are identified as containing, habitat for the western yellow-billed cuckoo. If stream crossings are required, then they shall be constructed at right angles to minimize impacts to riparian vegetation, stream-banks, soils, and water quality. Roads and trails shall be placed near current habitat edge areas to reduce fragmentation of larger blocks of pristine habitat. Combine multiple roads and rights-of-ways to one stream crossing site.

Avoid depleting ground water and diverting streams outside their natural stream channels in riparian areas that contain potential western yellow-billed cuckoo habitat.

Maintain beaver populations where they occur in cuckoo habitat and encourage re-introduction into areas that were historically occupied by beavers in western yellow-billed cuckoo habitat.

In identified western yellow-billed cuckoo habitat, implement riparian monitoring programs to establish baseline data and identify changes that have occurred in order to evaluate both long-term and short-term impacts and/or benefits to the birds.

Manage for stable or increasing population of cottonwood-willow vegetation in areas identified as western yellow-billed cuckoo habitat. Ensure that all age classes are present (seedling, young, mature, and decadent), with more seedlings present than decadent plants, and more young plants present than mature plants.

Prescribed fire would only be used to maintain or enhance yellow-billed cuckoo habitat. Restrictions such as smoke dispersal, heat intensity, buffer zones or timing stipulations would be incorporated into the fire plan.

Wyoming Toad (*Bufo baxteri*)

Listing Status: Federal- Endangered, February 16, 1984

Species Description

The Wyoming toad is small, at 2 to 3 ¼ -inches (5.1 to 8.25cm) in size. The females weight approximately 35 grams and the males weigh approximately 25 grams. The cranial crests fuse medially to form an elongated boss, or ridge with a median groove, between the eyes. The tympanum is round and smaller than their eyes. They are green or gray to brown, with dark warts; the males have a dark throat.

This toad has a narrow light line down the middle of the back, the underside is spotted, and the toad's parotoid glands are oval and somewhat indistinct.

Life History

Adults emerge from hibernation in May when the daytime temperatures go above 70 degrees Fahrenheit. They frequently use abandoned pocket gopher and ground squirrel burrows as hibernacula. Once abundant in the wetlands and irrigated meadows of Wyoming's southeastern plains, the Wyoming toad is now restricted to small seepage lakes and ponds in the Laramie Basin in Albany County (Baxter and Stone 1985). Their diet includes ants, beetles and other arthropods.

Population Distribution

The Wyoming toad is thought to be a relictual population left behind as glaciers retreated. Some authors have argued that the Wyoming toad is a full species, but Porter (1968) presented evidence that it is subspecifically distinct from *Bufo hemiophrys hemiophrys* (Federal Register 1984). Prior to about 1970, the Wyoming toad was relatively abundant in the Laramie basin, but now, the subspecies is confined to wetland habitats adjacent to Mortenson Lake, Mortenson National Wildlife Refuge (Baxter and Stone 1985). This is the only wild population of these toads.

Reintroduced populations exist at Meeboer Lake, Lake George, Hutton Lake, and Hutton National Wildlife Refuge. Nine captive-breeding facilities, including the Henry Doorly Zoo and the Saratoga National Fish Hatchery, are successfully rearing the Wyoming toad for reintroduction into the wild.

Field Office Distribution

In the Rawlins Field Office, the only naturally occurring populations of Wyoming toad are found adjacent to Mortenson Lake, within the Mortenson National Wildlife Refuge. The decline of the Wyoming toad can be attributed to a number of significant events including habitat loss or degradation, predation, drought cycles, chytrid fungus, and pesticides.

Historic ranching practices involved flooding the plains adjacent to the Little Laramie River. Changes in irrigation practices may have resulted in the drying out of former habitats before tadpole development was complete. Drainage of habitat for non-irrigation uses may have contributed to the decline of the toad.

Pesticides are believed to be one of the primary factors contributing to the decline of the species. The use of the herbicide Atrazine is known to decimate *Bufo* populations and it can be introduced into watersheds in sufficient levels to kill *Bufo* eggs and tadpoles.

Widespread aerial spraying of fenthion (commercially known as Baytex) for mosquito control occurred around the time the toad numbers started to fall. The mosquito control technique of mixing this with diesel fuel began in 1975. When applied with little control of drift, the spray proved to be highly toxic to toads. Some evidence indicates that diesel fuel alone is toxic to amphibians. This pesticide was subsequently not registered with the Environmental Protection Agency after 1992.

It is interesting to note that the last wild toad population, found in 1987, was on lands of the future Mortenson National Wildlife Refuge where mosquito spraying was not allowed. This could be an indication that insecticide spraying and reduced mosquito populations may be a direct affect on populations.

Pesticides may also contribute to the increase in fungal outbreaks that have caused significant population declines. This may be due to pesticides causing a reduction in immunity factors that would normally

protect the species. Of particular concern is the recent outbreak of amphibian chytrid fungus *Batrachochytrium dendrobatidis* that causes chytridomycosis in the species that leads to low survivability of these species. Whether these outbreaks are a result in recent environmental changes or are naturally occurring is still unknown.

Reproduction and Survivorship

Breeding of the Wyoming toad occurs from mid-May to mid-June. Strings of 2-5,000 heavily pigmented eggs are laid in the water. The tadpoles metamorphosis into toads in 4-6 weeks. The toads then move back into hibernation in mid-September.

Management Status Recovery and Conservation Planning

In 1991 the USFWS and the Wyoming Game and Fish Department (WGF) drafted a recovery plan for the toad. A captive breeding component was included in this plan. Captive breeding populations are now found at eight zoos around the country, and at the Saratoga National Fish Hatchery and Sybille Wildlife Research Center, both in Wyoming. There are now nearly 600 toads in captivity. Each spring a number of the offspring produced are held back for the captive breeding program. The rest are returned to Wyoming, where they are released as tadpoles or toadlets.

In 1996 the American Zoo and Aquarium Association (AZA) developed a Species Survival Plan (SSP) that formalized a cooperative program with the USFWS and the WGF. The following habitat conservation measures and species conservation measures will be implemented within the RFO in areas where there is the potential for the Wyoming toad to occur in riparian habitat. In addition, the Safe Harbor Agreement was signed and implemented to conserve the species.

Habitat Conservation Measures

For the protection of the Wyoming toad and its identified habitat, surface-disturbing activities will be avoided in the following areas: (a) identified 100-year flood plains; (b) areas within 500 feet from perennial waters, springs, wells, and wetlands, and; (c) areas within 100 feet from the inner gorge of ephemeral channels.

Species Conservation Measures

When project proposals are received, BLM will initiate coordination with the Service at the earliest possible date so that the USFWS can advise on project design. This should minimize the need to redesign projects at a later date to include Wyoming toad conservation measures, determined as appropriate by the USFWS.

Best Management Practices

Linear crossings, such as pipelines or roads across the above areas, should be considered on a case-by-case basis with intensive management to protect habitat for the Wyoming toad. Intensive management may vary from year to year and includes the use of proper distance restrictions, seasonal or timing restrictions, rehabilitation standards, and use of BMPs.

Buffers should be established around water bodies and wetlands within in the Laramie basin for pesticide use (taking into account their toxicity, intended use, and method of application) until areas are searched for two consecutive years and cleared (no toads present in either year).

The BLM should work towards developing reintroduction sites in coordination with the Service and WGFD and maintain the integrity of these sites for the survival of the toad.

Coordinate with the USFWS and private landowners to ensure that the toad and its habitat are adequately protected.

When applicable, pursue withdrawals in habitat where there is identified historic and/or current toad breeding locations, as well as in areas where toads have been released. In addition, implementing NSOs to these areas may be required to achieve toad recovery objectives.

Develop recreational activity restrictions in accessible areas located within or adjacent to primary or secondary Wyoming toad habitats.

Western Boreal Toad (*Bufo boreas boreas* – southern Rocky Mountain population)

Listing Status: Federal - Candidate – July 1994

Species Description

Western boreal toad (boreal toad) adults are 8-12cm long with a stout body and short, blunt head. They are olive, brownish or black with conspicuous white or yellowish mid-dorsal stripe. The sides and belly of this toad have many black spots and the throat is lighter. Immature toads have bright yellow or orange flecks on the ventral surface of the feet and body. The fully developed larvae are dark-brown to black and are 14-17mm long. The eggs are black, about 1.5 to 1.8mm in diameter and often occur in 2 rows of long gelatinous strings in ponds or streams.

Life History

These toads hibernate during the winter months and emerge shortly after the ground thaws, generally in early May to early June. Toads are mainly diurnal and bask in sunlight to increase body temperature during cool days. Foraging may occur in drier areas and nocturnally. They seek shelter and hibernate under logs or rocks, in rodent burrows, or in other below-ground spaces.

Hibernation takes place in chambers near streams with ground water beneath the chamber floor or in rodent burrows deep enough to prevent freezing and with soil moisture high enough to prevent desiccation. Most boreal toads are in hibernation by early October but association with the hibernacula may occur as early as late August (Steve Corn, U.S. Geological Service-Biological Resources Division, 1997).

Boreal toads eat primarily ants, but consume a variety of invertebrates, which they find using olfactory cues. Larvae filter suspended plant material or feed on bottom detritus.

Boreal toads typically occur at elevations between 8,000 and 11,000 feet (2,420 and 3,420 meters) in spruce-fir (*Picea spp.-Abies spp.*), forests, and meadows (Burger and Bragg 1946, Smith et al. 1965, Baxter and Stone 1985, Hammerson 1989). They also may be found as low as 7,000 feet (2,100 meters) in willow (*Salix spp.*) dominated riparian areas surrounded by sagebrush (*Artemisia spp.*) or grassland and as high as 12,900 feet (4,000 meters) in alpine habitats.

Population Distribution

Physical and climatic characteristics of the Great Divide Basin separate boreal toads in the southern Rocky Mountains, including southeastern Wyoming, Colorado, and north-central New Mexico (southern

population) from populations in the Wasatch and Uinta Mountains of Utah to the west and the Wind River and Salt River Ranges of Wyoming to the north (northern populations). The basin's hot, dry summers, lack of available water and high desert vegetation provide unsuitable habitat for the boreal toad. However, suitable habitat is thought to exist in the Ferris and Seminoe Mountains located between the southern Rocky Mountain populations in southern Wyoming and Colorado and the northern Rocky Mountain populations. Although the potential for toads to occur in these areas does exist, it should be noted that surveys of these areas have not been completed to date. In addition, this is a portion of the Ferris Mountains WSA and there have not been any projects to date that have been authorized that would impact the toad.

The geographic isolation and genetic divergence led the USFWS to designate the boreal toads in the southern Rocky Mountain region as a distinct population segment (DPS). Southern Rocky Mountain DPS of the boreal toad was once common throughout much of the high elevations in Colorado and in the Snowy and Sierra Madre Ranges of southeast Wyoming. Declines in isolated breeding sites or localities were first documented in New Mexico and Wyoming in the mid-1980's (Woodward and Mitchell 1985, Corn et al. 1989). In the late 1980's, boreal toads were found to be absent from 83 percent of breeding localities in Colorado and 94 percent of breeding localities in Wyoming previously known to contain them. A locality may be comprised of more than one specific breeding site separated by no more than one half mile. A population is comprised of one or more breeding localities in a second or third order drainage separated by no more than five miles (Boreal Toad Recovery Team 2001a).

Field Office Distribution

Surveys in 1998 found 33 active breeding localities; however, all localities were in Colorado except for one in Wyoming. Non-breeding adults were documented from 30 sites in 1998 (Boreal Toad Recovery Team 1999). In 1999, the number of known breeding localities jumped to 50, still with only one in the RMPPA (Boreal Toad Recovery Team 2000). However, the increase in breeding localities was likely due to increased survey efforts rather than expansion of the population. The 50 breeding locations comprised 29 populations with five of these considered viable under the criteria established by the Recovery Team.

In 2001, three additional active localities were discovered, for a total of 37 active breeding localities and 10 inactive localities. In 2000 and 2001, only one adult was detected at the Bird Creek, Wyoming site; this site is considered "inactive". Only two single adults were seen in two other areas in Wyoming in 2001 (CDOW, unpubl. data 2001).

Within the RMPPA, the known distribution of the southern Rocky Mountain population of the boreal toad includes publicly owned lands primarily within the Medicine Bow National Forest. Surveys have not been completed on all BLM lands which may contain suitable habitat for boreal toads.

Historical sightings have been documented on RFO BLM lands within the Powder Rim and Upper Muddy Creek areas. Current surveys have not been conducted in these areas to further substantiate populations.

Reproduction and Survivorship

Suitable breeding sites are in lakes, marshes, ponds, and bogs with shallow water and sunny exposure. The toads rarely lay eggs in streams. Breeding typically takes place in late-May or early-June but may occur as late as mid-July. Young toads are restricted to moist habitats, but after breeding, adults, especially females, may move several miles into upland forests and meadows.

Management Status Recovery and Conservation Planning

A multi-agency Boreal Toad Recovery Team (BTRT) was formed in 1994 to provide coordinated recommendations on the conservation and management of the southern population. The BTRT has been meeting every year since its formation to discuss its ongoing efforts. Captive propagation and reintroduction efforts are ongoing, but have largely been unsuccessful in Wyoming.

The following habitat conservation measures and species conservation measures will be implemented within the RFO in coordination with the Conservation Plan and Agreement for the Management and Recovery of the Southern Rocky Mountain Population of the Boreal Toad in areas where there is the potential for the Western boreal toad to occur in upland and riparian habitat types.

Habitat Conservation Measures

For the protection of the western boreal toad and its identified habitat, surface-disturbing activities will be avoided in the following areas above 7500 feet: (a) identified 100-year flood plains; (b) areas within 500 feet from perennial waters, springs, wells, and wetlands; and (c) areas within 100 feet from the inner gorge of ephemeral channels.

Species Conservation Measures

When project proposals are received, BLM will initiate coordination with the Service at the earliest possible date so that the USFWS can advise on project design. This should minimize the need to redesign projects at a later date to include Western boreal toad conservation measures, determined as appropriate by the USFWS.

Best Management Practices

Linear crossings, such as pipelines, roads, or utility corridors, within potential or known habitat for the Western boreal toad, will be considered on a case-by-case basis to eliminate potential barriers to water flow and toad movements. Intensive management should be implemented to protect habitat for the western boreal toad.

Timber harvest within known or potential boreal toad habitat should be evaluated on a case-by-case basis to avoid adverse affects to the species.

Grazing practices within riparian areas associated with known or potential habitat for the western boreal toad should be managed at a minimum to meet Proper Functioning Condition (PFC) requirements.

North Platte River and Colorado River Species

Introduction

Several avian, fish, and one plant species, occurring as residents or migrants in the Platte River and Colorado River basins (inclusive of major tributaries), have experienced material declines in abundance, distribution, and the availability of suitable habitats since the turn of the twentieth century. The reasons for these declines in abundance, distribution, and availability of suitable habitats are multifarious, but the two most pervasive and encompassing reasons are: (1) the effects of water developments, including dam construction, diversion and consumptive use of water, and concomitant changes in river flow and channel characteristics; and, (2) introductions of non-native aquatic species.

Water developments such as dams, reservoirs and irrigation diversions have altered natural surface-water hydrographs (timing, magnitude, and duration). Altered hydrographs can indicate negative effects on the ecosystems of river-dependent species such as the interior least tern and pallid sturgeon. Changes in the relative magnitudes of regulated flows, before nesting versus during nesting, have resulted in more frequent inundation of the nests of federally-listed avian species (e.g. piping plover and interior least tern). Too little water at certain times of the year can subject federally-listed birds to excessive predation during periods of nesting and roosting (Gordon et al. 1992); this condition can also limit the availability of forage fish to the pallid sturgeon. In addition, reductions in the magnitude and frequency of high flows can adversely impact the characteristics of flood-prone areas and wetlands and the ecological benefits they provide to federally-listed species; these conditions can allow vegetation to encroach on less vegetated areas, the result of which is a narrowing of relatively open channels (Gordon et al. 1991). Finally, in the lower Platte River, pallid sturgeon may lose important migratory cues that were probably influenced by historically, unregulated higher flows in the spring of the year; relatively low spring flows have negatively impacted habitat conditions for pallid sturgeon that were dependent of historical levels of sediment transport and deposition and on the influx of greater amounts of organic material.

Habitat alterations and habitat fragmentation due to dams, reservoirs, and regulated flows have resulted in changes in habitat availability, habitat distribution, and habitat quality. Additionally, introductions of non-native fishes, such as rainbow trout, brown trout, and channel catfish, have resulted in competitive exclusion and diminished abundance of native fishes in much of their historic ranges. Similar impacts have reduced populations of federally-listed fishes in the upper Colorado River basin, such as the Colorado pikeminnow. Finally, the inundation or diminution of wetland habitats due to flow regulation and reduced water availability can negatively impact wetland plants. In the planning area, water depletions—though they occur hundreds of miles upstream—can affect population abundance and the availability of suitable habitats for federally-listed birds, fishes, and one plant in the Platte River and upper Colorado River basins.

The BLM has historically authorized several types of activities and associated infrastructure within the RMPPA that constitute water depletions in both the North Platte and Colorado River basins; a depletion to river flows occurs when tributary surface water or groundwater is removed from its source—to the extent that some of the water is not returned to its source—to be used elsewhere for a beneficial use. These activities include the development of livestock watering facilities, irrigation projects, wetlands, reservoirs for recreational fisheries, habitat restoration projects, as well as fire suppression and oil and gas development.

Consultation History and Historic Depletions: The BLM completed a formal consultation for the reauthorization of livestock watering facilities in the Colorado River Basin in October of 2000. Additionally, the BLM has completed formal consultation on several projects in the Colorado River Basin that have occurred subsequent to the issuance of the Biological Opinion on Colorado River Depletions Resulting from Reauthorization of Livestock Watering Facilities, Wyoming on September 21, 2000. The Programmatic Biological Assessment for Minor Water Depletions Associated with Reissuing of BLM Grazing Leases in the Platte River Basin of July 1, 1999 addressed existing minor depletions in the Platte River Basin. The BLM has also completed subsequent formal consultation on several additional projects in the Platte River Basin. Table 3 summarizes historic water depletions for the Colorado River and Platte River systems for which formal consultation has been conducted prior subsequent to the issuance of these programmatic opinions.

Table 3. Historic Water Depletions for which consultation has occurred subsequent to the issuance of the aforementioned programmatic opinions:

Basin	# Projects	Depletion (ac ft/yr)
Platte River	21	6
Colorado River	48	145

Potential New Depletions: Most foreseeable future water depletions (e.g. stock water development, wells at campgrounds) are likely to be minor (<25 ac-ft/yr). Potential projects, which may be implemented over the life of the RFO RMP, are shown in Table 4. New projects that affect the timing or quantity of water will be consulted on through the appropriate processes and are only presented here to provide an estimate of the number and magnitude of activities that may occur over the life of the RMP.

Water development projects often consist of small impoundments designed to capture runoff events. These projects are associated with livestock management activities and wetland creation. The magnitude of depletions associated with these projects as depicted in Table 4 was estimated from the average development rate for the years 1999-2003.

The use of water by the fire management program was considered for both prescribed fire and wildfire suppression. When conducting prescribed fire operations, water used in suppression is obtained from Rawlins municipal sources. For this reason, it is not expected that the use of water for prescribed fire operations would cause an additional depletion of water from either the Platte River Basin or Colorado River Basin. The amount of water used in wildfire suppression activities over the life of this plan has been estimated by extrapolating the average volume of water used per year.

The use of water during well drilling and operation activities has been calculated by estimating the average volume of water used per well and multiplying by the estimated number of wells anticipated over the life of the plan by water basin. Well construction activities include well drilling and completion operations, hydrostatic testing for local pipelines and dust abatement.

Table 4 – Potential new activities that may deplete water during implementation of the RFO RMP.

Type of Project	# Of Projects	Platte River Basin		Colorado River Basin		
		Estimated Water Use	Total Water Use	# Of Projects	Estimated Water Use	Total Water Use
Water developments	105	0.29 acre-ft/project	30 acre-ft	240	2.96 acre-ft/project	725 acre-ft
Wildfire suppression	-	-	0.31 acre-ft	-	-	0.31 acre-ft
Well construction activities	1631	0.41 acre-ft/well	662 acre-ft	3152	0.65 acre-ft/well	2064 acre-ft

North Platte River Species and Critical Habitat

Federally listed species in the Platte River that may be affected by water depletions resulting from BLM authorized actions within the RMPPA are listed in Table 5. Designated Critical Habitat for the Whooping Crane and the northern Great Plains breeding population of the Piping Plover may also be adversely affected

Table 5. Federally listed species that are native to the Platte River and may be affected by water depletions resulting from BLM authorized actions within the RMPPA

Common Name	Scientific Name	ESA Status	Designated Critical Habitat
Whooping Crane	<i>Grus americana</i>	Endangered	Yes
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Threatened	No
Eskimo Curlew	<i>Numenius borealis</i>	Endangered	No
Piping Plover	<i>Charadrius melodus</i>	Threatened	Yes
Interior Least Tern	<i>Sterna antillarum</i>	Endangered	No
Western prairie fringed orchid	<i>Platanthera praeclara</i>	Threatened	No
Pallid Sturgeon	<i>Scaphirhynchus albus</i>	Endangered	No

Whooping Crane (*Grus Americana*)

Listing Status: Federal – Endangered

Species Description

The whooping crane stands 5 feet tall and has a long, sinuous neck and long legs. Its snowy white body feathers are accented by jet-black wingtips and a red and black head with a long, pointed beak. The whooping crane's wings measure about 7 feet across. The whooping crane is named for its call, which has been described as a shrill, bugle-like trumpeting.

Status and Distribution of Species

Listed endangered (32 FR 4001, 1967 March 11) except where nonessential experimental population (66 FR 33903-33917, 2001 June 26; 62 FR 38932-38939, 1997 July 21; and 58 FR 5647-5658, 1993 January 22) in Colorado, Indiana, Florida, New Mexico, Utah, and the western half of Wyoming. Presently, the distribution of the whooping crane is limited due to habitat loss and extremely low population size. Whooping cranes breed near Wood Buffalo National Park (Northwest Territories and Alberta). The birds winter near Arkansas National Wildlife Refuge (Texas Gulf Coast) and on occasion, they venture northeast into Louisiana. Migrating between these locations, whooping cranes use the Platte River flyway.

Habitat Associations and Life History Requirements

Whooping cranes use a variety of habitats during migration (Howe 1987, 1989, Lingle 1987, Lingle et al. 1991), including croplands (feeding) and large palustrine (marshy) wetlands (roosting). Whooping cranes also roost in riverine habitat, most notably the Platte River, Middle Loup River, and Niobrara River in Nebraska; Cimarron River in Oklahoma; and the Red River in Texas (USFWS confirmed sighting records). Cranes roost on submerged sandbars in wide unobstructed channels that are isolated from human disturbance (Armbruster 1990).

Threats from Human Activity

Primary threats to the whooping crane population due to human activities include draining wetland habitats, coastline development, and human activity near breeding and nesting sites.

Environmental Consequences and Viability

Because whooping crane populations are extremely small, their genetic integrity and persistence are highly uncertain. Primary threats due to human activities include draining wetland habitats, coastline development, and human activity near breeding and nesting sites.

Management Status and Recovery and Conservation Planning

Recovery Plan completed on February 11, 1994.

Determination

Given the precarious state of this species and the great cumulative effects of depletions on other lands, the Fish and Wildlife Service has great concern about the effect of any water depletion, however small, on water level in the Platte River in Nebraska. Implementation of the RFO RMP is likely to adversely affect the Whooping Crane.

Species Conservation Measures

For projects that cause depletions to the Platte River system, the BLM will initiate formal consultation with the Service.

Best Management Practices

When developing or improving water source in the North Platte River system, BLM would consider development designs such as water wells and guzzlers rather than surface impoundments to minimize impacts to surface water hydrology resulting from attenuation of flood peaks and evaporative loss.

Whooping Crane (*Grus Americana*) Critical Habitat

Listing Status: Critical Habitat identified March 1979, amended July 1997

Critical Habitat Description

Critical Habitat for the Whooping Crane has been designated along the Platte River between Lexington and Denman, Nebraska within T. 32 N., R. 18 W.; T. 52 N., R. 19 W.; T. 32 N., R. 20 W.; T. 32 N., R. 21 W.; and T. 32 N., R. 22 W.

Determination

Given the precarious state of this species and the great cumulative effects of depletions on other lands, the Fish and Wildlife Service has great concern about the effect of any water depletion, however small, on water level in the Platte River in Nebraska. Implementation of the RFO RMP is likely to adversely affect the designated critical habitat of the Whooping Crane.

Habitat Conservation Measures

For projects that cause depletions to the Platte River system, the BLM will initiate formal consultation with the Service.

Best Management Practices

When developing or improving water source in the North Platte River system, BLM would consider development designs such as water wells and guzzlers rather than surface impoundments to minimize impacts to surface water hydrology resulting from attenuation of flood peaks and evaporative loss.

Eskimo Curlew (*Numenius borealis*)

Listing Status: Federal-endangered

Species Description

The Eskimo curlew resembles a Whimbrel (a relatively abundant species which also nests on tundra) but is much smaller and the crown is less strongly patterned. Its upper body is grayish-brown, whitish and streaked below, dark eye line, wing linings cinnamon, legs are dark gray, bill blackish and slightly decurved. Sexes are similar in appearance but females are larger. Their diet consists almost entirely of berries during boreal autumn before migration, and insects (mostly grasshopper) during spring. The species would gorge at these two periods preceding their non-stop, partly transoceanic flights between Arctic breeding grounds and nonbreeding grounds in South America. There is no specific information on breeding, nesting, brooding behaviors; other than based on similar taxa. Other Numeniini are very long-lived, up to 30 years.

Status and Distribution of Species

The Eskimo Curlew is listed as endangered under the Endangered Species Act of 1973. This species nests in the Arctic tundra and winters in South America; the Eskimo curlew is sometimes sighted near the Texas coast during migratory interludes. Migration pathways include the Platte River flyway. The Eskimo Curlew does not occur in the RMPPA.

Habitat Associations and Life History Requirements

The Eskimo curlew has specific habitat needs that cause them to migrate great distances to complete their life cycle. They nest in treeless tundra in Alaska and the Northwest Territories, Canada. After nesting, in August and early September they assemble in flocks along the coast of Labrador where they feed voraciously before commencing their nonstop migration across the western Atlantic Ocean to Argentina, South America, 15,000 miles from their breeding grounds. The return northward migration in February follows a completely different route, traversing over the western South American continent, across the Gulf of Mexico, into the Central Flyway of the Great Plains state, where they stopover to feed and ultimately arrive back to their tundra breeding grounds.

Threats from Human Activity

Any activity that disturbs migratory habitats (including wet meadows along the central Platte River in Nebraska) is detrimental to the persistence of this species.

Environmental Consequences and Viability

The Eskimo Curlew appears near the brink of extinction. Any activity that disturbs migratory habitats (including wet meadows along the central Platte River in Nebraska) is detrimental to the persistence of this species.

Management Status and Recovery and Conservation Planning

Information on this species is incomplete. Eskimo curlews are extremely rare and breeding grounds occur in areas well beyond normal human encroachment (NYDEC 2003). This rarity has inhibited recovery and conservation planning efforts.

Determination

Given the precarious state of this species and the great cumulative effects of depletions on other lands, the Fish and Wildlife Service has great concern about the effect of any water depletion, however small, on its habitat along the Platte River in Nebraska. Implementation of the RFO RMP is likely to adversely affect the Eskimo Curlew.

Species Conservation Measures

For projects that cause depletions to the Platte River system, the BLM will initiate formal consultation with the Service.

Best Management Practices

When developing or improving water source in the North Platte River system, BLM would consider development designs such as water wells and guzzlers rather than surface impoundments to minimize impacts to surface water hydrology resulting from attenuation of flood peaks and evaporative loss.

Piping Plover (*Charadrius melodus*)

Listing Status: Federal-threatened

Species Description

The piping plover is a small, stocky, sandy-colored bird resembling a sandpiper. The adult has yellow-orange legs, a black band across the forehead from eye to eye, and a black ring around the base of its neck. Like other plovers, it runs in short starts and stops. When still, the piping plover blends into the pale background of open, sandy habitat on outer beaches where it feeds and nests. The bird's name derives from its call notes, plaintive bell-like whistles which are often heard before the birds are seen.

Status and Distribution of Species

Listed Threatened (50 FR 50726-50734, 1985, December 11) in entire range except in the Great Lakes watershed where listed Endangered. This species breeds in south-central Alberta and Manitoba to eastern Montana and central and eastern Nebraska. In addition, these birds breed in the Great Lakes region from northern Michigan and southern Ontario to the shores of Lake Michigan and Lake Ontario. Piping Plovers winter in eastern Texas and in other coastal locations along the Atlantic Seaboard from South Carolina to Florida. The Piping Plover does not occur in the RMPPA.

Habitat Associations and Life History Requirements

These birds prefer exposed, sparsely vegetated, sandy shores and islands within shallow lakes and ponds. In addition, piping plovers can be found in expansive, open, sandy areas that have tufts of grass. Winter habitats comprise beaches, lagoon margins, and areas of rubble substrate.

Threats from Human Activity

Flood abatement activities such as water diversions that permit shoreline vegetation to flourish and human activity in general threaten piping plover habitats and populations. Alterations of water flow change the structure of sandbars preferred for nesting (though the birds nest on sandy shores as well), and irregular flows may flood nests, or leave the sandbar connected to the shore and more vulnerable to predation.

Environmental Consequences and Viability

Steadily declining numbers of piping plovers and habitat loss appear to suggest that the persistence of this species is problematic.

Management Status and Recovery and Conservation Planning

Recovery plan completed May 02, 1996.

Determination

Given the great cumulative effects of depletions on other lands, the Fish and Wildlife Service has great concern about the effect of any water depletion, however small, on water flows in and the species' nesting habitat along the Platte River. Implementation of the RFO RMP is likely to adversely affect the Piping Plover.

Species Conservation Measures

For projects that cause depletions to the Platte River system, the BLM will initiate formal consultation with the Service.

Best Management Practices

When developing or improving water source in the North Platte River system, BLM will consider development designs such as water wells and guzzlers rather than surface impoundments to minimize impacts to surface water hydrology resulting from attenuation of flood peaks and evaporative loss.

Piping Plover Critical Habitat

Listing Status: Critical Habitat identified September 2002

Critical Habitat Description

On the Platte River, critical habitat has been designated from the Lexington Bridge, Nebraska, downstream to the confluence of the Platte and Missouri rivers. Habitat included in the designation in Nebraska is composed of sparsely vegetated channel sandbars, sand and gravel beaches on islands within the high bank for nesting, temporary pools on sandbars and islands, and the interface of sand and river where plovers forage.

Determination

Given the great cumulative effects of depletions on other lands, the Fish and Wildlife Service has great concern about the effect of any water depletion, however small, on water flows in and the species' nesting habitat along the Platte River. Implementation of the RFO RMP is likely to adversely affect the designated critical habitat for the Piping Plover.

Habitat Conservation Measures

For projects that cause depletions to the Platte River system, the BLM will initiate formal consultation with the Service.

Best Management Practices

When developing or improving water source in the North Platte River system, BLM will consider development designs such as water wells and guzzlers rather than surface impoundments to minimize impacts to surface water hydrology resulting from attenuation of flood peaks and evaporative loss.

Interior Least Tern (*Sterna antillarum*)

Listing Status: Federal-endangered

Species Description

Least terns (all currently recognized subspecies and populations) are the smallest members of the subfamily Sterninae and family Laridae of the order Charadriiformes, measuring about 21-24 cm long with a 51 cm wingspread. Sexes are alike, characterized by a black-capped crown, white forehead, grayish back and dorsal wing surfaces, snowy white undersurfaces, legs of various orange and yellow colors depending on the sex, and a black-tipped bill whose color also varies depending on sex. Immature birds have darker plumage than adults, a dark bill, and dark eye stripes on their white foreheads (Watson 1966, Davis 1968, Boyd and Thompson 1985).

The interior least tern is piscivorous, feeding in shallow waters of rivers, streams and lakes. Other least terns also feed on crustaceans, insects, mollusks and annelids (Whitman 1988). The terns usually feed close to their nesting sites. Fish prey is small sized and important genera include *Fundulus*, *Nortopis*, *Campostoma*, *Pimephales*, *Gambusia*, *Blonesox*, *Monrone*, *Dorosoma*, *Lepomis* and *Carpiodes* (Grover 1979, Hardy 1957, Rumancik 1988, 1989; Schulenberg et al. 1980, Smith and Renken 1990, Wilson et al. 1989). Fishing occurs close to the riverine colony. Terns nesting at sand and gravel pits and other artificial habitats may fly up to 3.2 km to fish.

Status and Distribution of Species

Listed Endangered (50 FR 21784-21792, 1985 May 28) in the United States, except within 50 miles of the coast. The Interior Least Tern prefers sandbars of rivers, inland islands, expansive sand and gravel beaches, and salt plains in Oklahoma. For nesting, this species prefers river sandbars. The least tern (interior variety) breeds near the following river basins: Colorado River; Red River; Platte River, Missouri; and Mississippi River from southern South Dakota, western Iowa, northwestern Indiana to central Oklahoma, Louisiana, New Mexico, and Texas. These birds winter along the Pacific Ocean near Baja California and along the Gulf Coast to South America. The Interior Least Tern does not occur in the RMPPA.

Habitat Associations and Life History Requirements

Least terns throughout North America nest in areas with similar habitat attributes. The riverine nesting areas of interior least terns are sparsely vegetated sand and gravel bars within a wide unobstructed river channel, or salt flats along lake shorelines. Nesting locations usually are at the higher elevations and away from the water's edge because nesting starts when the river flows are high and small amounts of sand are exposed. The size of nesting areas depends on water levels and the extent of associated sandbars. No critical habitat has been identified for this species.

Threats from Human Activity

Loss of gravel sand bars along rivers due to flow regulation threatens least tern populations. In addition, human disturbance in nesting areas negatively affects nesting success.

Environmental Consequences and Viability

Population declines and habitat loss suggest that the persistence of the Interior Least Tern is problematic.

Management Status and Recovery and Conservation Planning

Recovery Plan completed on September 19, 1990.

Determination

Given the endangered status of this species and the great cumulative effects of depletions on other lands, the Fish and Wildlife Service has great concern about the effect of any water depletion, however small, on water flow and nesting habitat in the Platte River in Nebraska. Implementation of the RFO RMP is likely to adversely affect the Interior Least Tern.

Species Conservation Measures

For projects that cause depletions to the Platte River system, the BLM will initiate formal consultation with the Service.

Best Management Practices

When developing or improving water source in the North Platte River system, BLM will consider development designs such as water wells and guzzlers rather than surface impoundments to minimize impacts to surface water hydrology resulting from attenuation of flood peaks and evaporative loss.

Pallid Sturgeon (*Scaphirhynchus albus*)

Listing Status: Federal-endangered

Species Description

The pallid sturgeon is one of the largest (30-60 inches, 76-152 cm) fishes found in the Missouri-Mississippi River drainage, with specimens weighing up to 85 pounds (39 kg). It is usually light brown on the dorsal surface and white underneath. It has a flattened, shovel-shaped snout. Fleshy chin barbels are located at about 1/3 the distance between the mouth and snout, with the inner barbels about 1/2 the length of the outer barbels. The pallid has a long, slender, flattened and armored region from the dorsal fin to the tail fin (caudal peduncle), which has a long upper lobe. There are no bony plates on the belly.

Status and Distribution of Species

Listed Endangered (55 FR 36641, 1990 September 06) in the United States. Pallid sturgeon are found, almost exclusively, in the headwaters of the Missouri River (in the vicinity of Fort Benton/Great Falls, MT) downstream to the Mississippi River near New Orleans, Louisiana. In addition, the pallid sturgeon is found in the Platte River near its confluence with the Missouri River.

Habitat Associations and Life History Requirements

The pallid sturgeon is native to the Missouri and Mississippi Rivers and, therefore, adapted to the pre—development habitat conditions that existed in these large rivers. These conditions generally can be described as large, free-flowing, warmwater, turbid habitat with a diverse assemblage of physical habitats that were in a constant state. The U.S. Fish and Wildlife Service has not designated critical habitats for the Pallid sturgeon.

Threats from Human Activity

Modification of the pallid sturgeon's habitat by human activities has blocked fish movement, destroyed or altered spawning areas, reduced food sources or ability to obtain food, altered water temperatures, reduced turbidity, and changed the hydrograph of the river system. Overfishing, pollution, and hybridization that occur due to habitat alterations also have probably contributed to the species' population decline.

Environmental Consequences and Viability

The U.S. Fish and Wildlife Service has determined that any water depletions in the Platte River basin are likely to adversely affect the pallid sturgeon. Water allocations in the North Platte River basin in Wyoming comprise a complex mix of private and public water rights and beneficial uses. Myriad water rights and designated beneficial uses working in concert with other confounding factors such as groundwater conditions, evaporation rates, transmission losses, and water quality conditions make it difficult to predict the likely effects to pallid sturgeon populations downstream in the Platte River.

Management Status and Recovery and Conservation Planning

Recovery Plan completed on November 7, 1993.

Determination

Given the endangered status of this species and the great cumulative effects of depletions on other lands, the Fish and Wildlife Service has great concern about the effect of any water depletion, however small, on water flow and nesting habitat in the Platte River in Nebraska. Implementation of the RFO RMP is likely to adversely affect the pallid sturgeon.

Species Conservation Measures

For projects that cause depletions to the Platte River system, the BLM will initiate formal consultation with the Service.

Best Management Practices

When developing or improving water source in the North Platte River system, BLM will consider development designs such as water wells and guzzlers rather than surface impoundments to minimize impacts to surface water hydrology resulting from attenuation of flood peaks and evaporative loss.

Western Prairie Fringed Orchid (*Platanthera praeclara*)

Listing Status: Federal – threatened

Species Description

The western prairie fringed orchid (WPFO) is a perennial forb with large and showy inflorescences. Plants are usually 30-85 cm tall and have 2-5 relatively thick, elongate, glabrous leaves (Sheviak and Bowles 1986). The WPFO reproduces primarily by seed, with flowering occurring between late June and mid-July and seed dispersal (wind and water) occurs in mid-September. Flowering patterns are often erratic, and certain information suggests that the plant commonly undergoes periods of dormancy (Bowles 1983). The species is self-compatible, but pollination is required for fruit and seed production. Two species of hawkmoths have been identified as pollen vectors for the orchid (Cuthrell and Rider 1993).

Status and Distribution of Species

Historically, the WPFO was found in tallgrass prairies west of the Mississippi river from southern Canada to Oklahoma. The current distribution of this species includes Minnesota, Iowa, Missouri, Nebraska, North Dakota and Manitoba, Canada. It is believed to be extirpated from South Dakota and Oklahoma. The WPFO is associated with wetlands. Orchid populations shift in time and space in response to water levels (Hoff et al. 1999). There are 172 population sites remaining in 6 states and one population complex in Manitoba, Canada (NatureServe 2003, NatureServe 2002, and USDI FWS 2002). The largest populations occur in Manitoba and on the Sheyenne National Grassland in North Dakota. The Sheyenne National Grassland is not tributary to the Platte River (USDA FS Sheyenne Ranger District 1999). There are an unknown number of populations located on Platte River in the targeted recovery area (USFWS pers. comm.). The species is listed as threatened by the USFWS, and has a TNC/NHP status of G2 (U.S. Fish and Wildlife Service 1996). The WPFO does not occur within the RMPPA.

Habitat Associations and Life History Requirements

The WPFO is associated with sedge meadows, primarily within the tallgrass prairie biome (Nebraska and the Great Plains). Across its range, this species is generally found in fire and grazing adapted grassland communities, most often on unplowed calcareous prairies and sedge meadows. It has also been documented in successional plant communities on disturbed sites. Maintenance of functional dynamic tallgrass prairie is key to survival of species.

Threats from Human Activity

The major factor contributing to the decline of this species is the conversion of native prairie to croplands.

Environmental Consequences and Viability

Since 1989, when the WPFO was listed as threatened, the US Fish and Wildlife Service has consistently taken the position in its section 7 consultations that Federal Agency actions resulting in water depletions to the Platte River system may affect the threatened WPFO. Although the WPFO is included by FWS as a threatened species that occurs in habitat downstream on the Platte River, it is not a target species for the Platte River Endangered Species Partnership. In addition, critical habitat has not been designated for this species.

Properly functioning downstream riparian systems provide conditions favorable for establishment and maintenance of riparian-dependent species such as western prairie fringed orchid. Any activities that lower water tables below the root zone of the orchids have the potential of seriously reducing orchid

populations (U.S. Fish and Wildlife Service 1996). Changes in timing and flow conditions in streams that flow from the RMPPA to the Platte River can result from several types of management activities: exercise of valid water rights that allow for diverting water from streams (including trans-basin diversions), associated land use authorizations including reservoirs, ditches and pipelines; administrative water uses including water rights for recreation sites and administrative facilities; and water yield changes from vegetation management. There would be no significant, measurable local or regional change in water yield within the Platte River Basin from implementation of the RFO RMP. Any re-authorization of existing special uses that involve water depletions or authorization of new uses that involve water depletions would be subject to FWS review.

Management Status and Recovery and Conservation Planning

A recovery plan for the WPFO was approved in 1996 (U.S. Fish and Wildlife Service 1996). The recovery plan emphasizes the need for actions that prevent further declines in orchid populations and habitat quality. This plan includes protection goals for existing habitat and de-listing criteria. The recovery plan direction focuses on protection status of existing habitat. Critical habitat has not been designated for the WPFO.

Determination

Since existing populations of WPFO are several hundred miles away from the RMPPA, and since known pollinators (sphinx or hawkmoths) are not known to travel across such distances for foraging or feeding, there will be no indirect effects from BLM management induced pollinator changes on downstream populations of western prairie fringed orchid.

Based upon the water yield and depletion discussion, and upon FWS opinions on the Platte River, implementation of the RFO RMP is likely to adversely affect western prairie fringed orchid.

Species Conservation Measures

For projects that cause depletions to the Platte River system, the BLM will initiate formal consultation with the Service.

Best Management Practices

When developing or improving water source in the North Platte River system, BLM will consider development designs such as water wells and guzzlers rather than surface impoundments to minimize impacts to surface water hydrology resulting from attenuation of flood peaks and evaporative loss.

Colorado River Basin Species and Designated Critical Habitat

Four endangered fish found in the Colorado River in Colorado may be affected by BLM authorized actions within the RMPPA (see Table 6).

Table 6 – Federally listed fishes under the Endangered Species Act of 1973 that are native to the Colorado River basin and may be affected by water depletions resulting from BLM authorized actions within the RMPPA

Common Name	Scientific Name	ESA Status	Designated Critical Habitat
Colorado Pikeminnow	<i>Ptychocheilus lucius</i>	Endangered	Yes
Razorback Sucker	<i>Xyruachen texanus</i>	Endangered	Yes

Common Name	Scientific Name	ESA Status	Designated Critical Habitat
Bonytail	<i>Gila elegans</i>	Endangered	Yes
Humpback Chub	<i>Gila cypha</i>	Endangered	Yes

Colorado pikeminnow (*Ptychocheilus lucius*)

Listing Status: Federal – endangered

Species Description

The Colorado pikeminnow (formerly Colorado squawfish) is a torpedo-shaped fish with an olive-green and gold back, silver sides and white belly. These fish spawn between late June and early September and when they are 5-6 years old and at least 16 inches long. Similar to salmon, Colorado pikeminnow can migrate more than 200 miles to spawn. The largest minnow in North America and one of the largest in the world, the Colorado pikeminnow at one time may have lived 50 or more years, growing to nearly 6 feet long and weights of up to 80 pounds.

Status and Distribution of Species

Listed as Endangered (32 FR 4001, March 11, 1967) in the entire, except Salt and Verde R. drainages, AZ. In addition, the Colorado pikeminnow is listed as threatened by the state of Colorado and is legally protected by the state of Utah. The Colorado pikeminnow was historically abundant in the Colorado River and most of its major tributaries such as the Yampa River and the Green River. Though a single individual was collected in 1990 from the Little Snake River within the planning area, Colorado pikeminnow are currently thought to be extirpated from Wyoming.

Habitat Associations and Life History Requirements

The Colorado pikeminnow prefers eddies and pools in large, deep rivers such as the Colorado River and the Green River.

Threats from Human Activity

Colorado pikeminnow populations have been dramatically reduced throughout their historic range due to past and present human activities. Pervasive threats to this species are due to habitat alterations resulting from water development and diversions. However, non-native fish introductions are the most pressing impediment to the recovery of this species; predatory, non-native fishes profoundly affect recruitment by consuming juveniles (Minckley et al. 2003). Recovery efforts, however, are expanding the abundance and distribution of this species where the effects of habitat fragmentation and habitat alteration can be directly addressed.

Environmental Consequences and Viability

The cumulative effects on the Colorado pikeminnow are due to activities that occur on public and private lands in the upper Colorado River basin (Wyoming, only) are real and may be measurable. The cumulative effects to this species are the result, primarily, of water developments and water uses in the basin. Also, introduced species such as rainbow trout are an important component of the cumulative effects that impact the Colorado pikeminnow; exotic trout tend to prey on young age classes of the pikeminnow.

Management Status and Recovery and Conservation Planning

Recovery plan completed August 28, 2002.

Determination

Due to the potential for further water depletions from the Colorado River Basin, implementation of the RFO RMP is likely to adversely affect the Colorado pikeminnow. If specific projects that incorporate water depletions are proposed during the planning period, the BLM will continue to consult with the U.S. Fish and Wildlife Service.

Species Conservation Measures

For projects that cause depletions to the Colorado River system, the BLM will initiate formal consultation with the Service.

Best Management Practices

When developing or improving water source in the Colorado system, BLM will consider development designs such as water wells and guzzlers rather than surface impoundments to minimize impacts to surface water hydrology resulting from attenuation of flood peaks and evaporative loss.

Colorado pikeminnow (*Ptychocheilus lucius*) Critical Habitat

Critical Habitat Description

The U.S. Fish and Wildlife Service has designated critical habitat for the Colorado pikeminnow as follows: the Yampa River (Moffat Co., CO) and its 100-years floodplain from State Highway 394 bridge, T.6 N., R.91 W., sec. 1, to its confluence with the Green River, T.7 N., R. 103 W., sec. 28 (6th Principal Meridian); Green River and its 100-years floodplain from its confluence with the Yampa River (Uintah, Carbon, Grand, Emery, Wayne, San Juan, counties and Moffat County, CO.), to the confluence with the Colorado River, T.30 S., R.19 E., sec.7 (Salt Lake Meridian); White River (Rio Blanco Co., CO) and its 100-years floodplain from Rio Blanco Lake Dam, T.1 N., R.96 W., sec. 6 (6th Principal Meridian) to the confluence with the Green River (Uintah Co., UT) in T.9, R.20 E., sec. 4 (Salt Lake Meridian); Gunnison River (Delta and Mesa Co., CO) and its 100-years floodplain from its confluence with the Uncomphage River in T.15 S., R.96 W., sec. 11 (6th Principal Meridian) to the confluence with the Colorado River in T.1 S., R.1 W., sec. 22 (Ute Meridian); Colorado River (Mesa and Garfield Co., CO and Grand, San Juan, Wayne, Garfield counties, UT) and its 100-years floodplain from the Colorado River bridge at Exit 90, north off Interstate 70 (river mile 238) in T.6 N., R.93 W., sec. 16 (6th Principal Meridian) to North Wash, including the Dirty Devil arm of Lake Powell, up to the full-pool elevation in T.33 S., R.14 E., sec.29 (Salt Lake Meridian); and the San Juan River (San Juan Co., NM and UT) and its 100-years floodplain from the State Route 371 bridge in T.29N., R.13 W., sec. 17 (New Mexico Meridian) to Neskahai Canyon in the San Juan arm of Lake Powell in T.41 S., R11 E., sec. 26, up to the full-pool elevation.

Determination

Due to the potential for further water depletions from the Colorado River Basin, implementation of the RFO RMP is likely to adversely affect the designated critical habitat of the Colorado pikeminnow. If specific projects that incorporate water depletions are proposed during the planning period, the BLM will continue to consult with the U.S. Fish and Wildlife Service.

Habitat Conservation Measures

For projects that cause depletions to the Colorado River system, the BLM will initiate formal consultation with the Service.

Best Management Practices

When developing or improving water source in the Colorado River system, BLM would consider development designs such as water wells and guzzlers rather than surface impoundments to minimize impacts to surface water hydrology resulting from attenuation of flood peaks and evaporative loss.

Razorback sucker (*Xyrauchen texanus*)

Listing Status: Federal – endangered

Species Description

One of the largest suckers in North America, the razorback sucker can grow to up to 13 pounds and lengths exceeding 3 feet. The razorback is brownish-green with a yellow to white-colored belly and has an abrupt, bony hump on its back shaped like an upside-down boat keel.

Status and Distribution of Species

The razorback sucker was historically well distributed in the Colorado River and in many of its major tributaries. Presently, the Razorback sucker is listed as endangered under the Endangered Species Act of 1973. In addition, the Razorback sucker is listed as endangered in the state of Colorado and it is legally protected by the state of Utah. The Razorback sucker does not occur within the RMPPA.

Habitat Associations and Life History Requirements

The Razorback sucker prefers fast, turbid waters in large rivers, such as the Colorado River and Green River.

Threats from Human Activity

The abundance and distribution of the razorback sucker has been dramatically reduced because of water developments such as dams and water diversions. In addition, the introduction of non-native trout into the historical habitats of the razorback sucker has almost eliminated their recruitment and survival (Minckley et al. 2003). Incidental catch by recreational anglers may pose a threat due to stress caused direct and delayed mortality.

Environmental Consequences and Viability

Water-development projects and activities such as dam construction/operation and water diversions have materially altered the preferred habitat conditions of the razorback sucker. Dams have altered the timing, magnitude, and duration of flows that characterize the variation in annual runoff in unaltered, large rivers; altered flows due to dam operation can also affect the abundance and distribution of spawning and rearing habitats preferred by the Razorback sucker. Both historical water depletions and any new water depletions are likely to negatively affect population and habitat conditions downstream, though assessing the effects on species viability may be difficult.

The cumulative effects on the Razorback sucker due to activities that occur on public and private lands in the upper Colorado River basin (Wyoming, only) are real and may be measurable. Cumulative effects that may negatively impact this species are the result, primarily, of water developments and water uses in the basin.

Management Status and Recovery and Conservation Planning

Recovery Plan completed December 23, 1998.

Determination

Due to the potential for further water depletions from the Colorado River Basin, implementation of the RFO RMP is likely to adversely affect the razorback sucker. If specific projects that incorporate water depletions are proposed during the planning period, the BLM will continue to consult with the U.S. Fish and Wildlife Service.

Species Conservation Measures

For projects that cause depletions to the Colorado River system, the BLM will initiate formal consultation with the Service.

Best Management Practices

When developing or improving water source in the Colorado system, BLM will consider development designs such as water wells and guzzlers rather than surface impoundments to minimize impacts to surface water hydrology resulting from attenuation of flood peaks and evaporative loss.

Razorback sucker (*Xyrauchen texanus*) Critical Habitat

Critical Habitat Description

The U.S. Fish and Wildlife Service has designated the following critical habitats for the Razorback sucker: Yampa River (Moffat Co., CO) and its 100-years floodplain from the mouth of Cross Mountain Canyon in T.6 N., R.98 W., sec. 23 (6th Principal Meridian) to its confluence with the Green River in T.7 N., R. 103 W., sec. 28 (6th Principal Meridian); Green River (Uintah Co., UT and Moffat Co., CO) and its 100-years floodplain and its confluence with the Yampa River in T.7 N., R.103 W., sec. 28 (6th Principal Meridian) to Sand Wash at river mile 96 in T.11 S., R.18 E., sec. 20 (6th Principal Meridian); Green River and its 100-years floodplain from Sand Wash at river mile 96 in T.11 S., R.18 E., sec. 20 (6th Principal Meridian) to the confluence to the Colorado River in T.30 S., R.19 E., sec.7 (6th Principal Meridian); White River (Uintah Co., UT) and its 100-years floodplain from the boundary of the Uintah and Ouray Indian Reservations at river mile 18 in T.9 S., R.22 E., sec. 21 (Salt Lake Meridian) to its confluence with the Green River in T.9 S., R.20 E., sec.4 (Salt Lake Meridian); Duchesne River (Uintah Co., UT) and its 100-years floodplain from river mile 2.5 in T.4 S., R.3 E., sec.30 (Salt Lake Meridian) to its confluence with the Green River in T.5 S., R.3 E., sec. 5 (Uintah Meridian); Gunnison River (Delta and Mesa, Co., CO) and its 100-years floodplain from its confluence with the Uncompahgre River in T.15 N., R.96 W., sec.11 (6th Principal Meridian) to Redlands Diversion Dam in T.1 S., R.1 W., sec. 27 (Ute Meridian); Colorado River (Mesa and Garfield Co., CO) and its 100-years floodplain from Colorado River bridge at Exit 90, north of Interstate 70 in T.6 S., R.93 W., sec.16 (6th Principal Meridian) to Westwater Canyon in T.20 S., R.25 E., sec.12 (Salt Lake Meridian) including the Gunnison River and its 100-years floodplain from the Redlands Diversion Dam in T.1 S., R.1 W., sec.27 (Ute Meridian) to its confluence with the Colorado River in T.1 S., R.1 W., sec. 22 (Ute Meridian); Colorado River (Grand, San Juan, Wayne, and Garfield counties, UT) and its 100-years floodplain from Westwater Canyon in T.20 S., R.25 E., sec.12

(Salt Lake Meridian) to full-pool elevation upstream of North Wash, including the Dirty Devil arm of Lake Powell in T.33 S., R.14 E., sec.29 (Salt Lake Meridian); and, the San Juan River (San Juan Co., NM and San Juan Co., UT) and its 100-years floodplain from the Hogback Diversion in T.29 N., R.16 W., sec.9 (New Mexico Meridian) to the full-pool elevation at the mouth of Neskahai Canyon on the San Juan arm of Lake Powell in T.41 S., R.11 E., sec.26 (Salt Lake Meridian).

Determination

Due to the potential for further water depletions from the Colorado River Basin, implementation of the RFO RMP is likely to adversely affect the designated critical habitats of the razorback sucker. If specific projects that incorporate water depletions are proposed during the planning period, the BLM will continue to consult with the U.S. Fish and Wildlife Service.

Habitat Conservation Measures

For projects that cause depletions to the Colorado River system, the BLM will initiate formal consultation with the Service.

Best Management Practices

When developing or improving water source in the Colorado River system, BLM would consider development designs such as water wells and guzzlers rather than surface impoundments to minimize impacts to surface water hydrology resulting from attenuation of flood peaks and evaporative loss.

Bonytail (*Gila elegans*)

Listing Status: Federal – endangered

Species Description

The body of an adult bonytail chub is highly streamlined, a greenish-grey, dusky color on its back with silvery sides, and a white belly. The bonytail chub may reach up to 24 inches in length and weigh over 2 pounds. Young fish in riverine habitats eat primarily chironomid larvae and mayfly nymphs. Small fish become more dependant on floating food as they grow, and juvenile chub eat a more diversified diet, including terrestrial and aquatic insects. Adult bonytail chub feed on terrestrial insects (Vanicek and Kramer 1969), gasteropods and caddis-worms (Kirsch 1888). The diet of bonytail chub in reservoirs appears to be primarily plankton and algae (Minckley 1973), and may also eat rainbow trout fry less than 2.5 inches (Wagner 1955).

Status and Distribution of Species

The bonytail is listed as endangered under the Endangered Species Act of 1973. Additionally, the bonytail is listed as endangered in the state of Colorado and it is legally protected by the state of Utah. Historically, the bonytail was abundant in the Colorado River and in its major tributaries such as the Green River and the Yampa River. At present, the bonytail is precariously extant in the Colorado River downstream of Lake Powell; the bonytail is nearly extinct upstream of Lake Powell. The Bonytail does not occur in the RMPPA.

Habitat Associations and Life History Requirements

The bonytail prefers fast-flowing, turbid waters in large, deep rivers in the upper Colorado River basin such as the Green River and Colorado River.

Threats from Human Activity

The bonytail is the most imperiled fish among the federally-listed fish species native to the Colorado River drainage. Water development projects and activities such as dams and water diversions have caused a nearly catastrophic decline in bonytail populations and in preferred habitats. Further, the introductions of non-native trout in the Colorado River drainage have contributed to the decline in bonytail abundance and distribution due to predation.

Environmental Consequences and Viability

The cumulative effects on the bonytail due to activities that occur on public and private lands in the upper Colorado River basin (Wyoming, only) are real and they may be measurable. Cumulative effects that may negatively impact this species are the result, primarily, of water developments and water uses in the basin. Introduced species such as rainbow trout, are a component of the cumulative effects, also; exotic trout tend to prey on young age classes of bonytail.

Management Status and Recovery and Conservation Planning

Recovery Plan completed September 4, 1990.

Determination

Due to the potential for further water depletions from the Colorado River Basin, implementation of the RFO RMP is likely to adversely affect the bonytail. If specific projects that incorporate water depletions are proposed during the planning period, the BLM will continue to consult with the U.S. Fish and Wildlife Service.

Species Conservation Measures

For projects that cause depletions to the Colorado River system, the BLM will initiate formal consultation with the Service.

Best Management Practices

When developing or improving water source in the Colorado system, BLM will consider development designs such as water wells and guzzlers rather than surface impoundments to minimize impacts to surface water hydrology resulting from attenuation of flood peaks and evaporative loss.

Bonytail (*Gila elegans*) Critical Habitat

Critical Habitat Description

The U.S. Fish and Wildlife Service has designated the following critical habitats for the bonytail: Yampa River (Moffat Co., CO) from the boundary of the Dinosaur National Monument in T.6 N., R.99 W., sec. 27 (6th Principal Meridian) to its confluence with the Green River in T.7 N., R.103 W., sec. 28 (6th Principal Meridian); Green River (Uintah Co., UT and Moffat Co., CO) from its confluence with the Yampa River in T.7 N., R.103 W., sec. 28 (6th Principal Meridian) to the boundary of Dinosaur National Monument in T.6 N., R. 24 E., sec. 30 (Salt Lake Meridian); Green River (Uintah and Grand Co., UT) (Desolation and Gray Canyons) from Sumner's Amphitheater in T.12 S., R.18 E., sec. 5 (Salt Lake Meridian) to Swasey's Rapid (river mile 12) in T.20 S., R.16 E., sec. 3 (Salt Lake Meridian); Colorado River (Grand Co., UT and Mesa Co., CO) in T.10 S., R.104 W., sec. 25 (6th Principal Meridian) to Fish Ford in T.21 S., R.24 E., sec. 35 (Salt Lake Meridian); and, Colorado River (Garfield and San Juan Co.,

UT) from Brown Betty Rapid in T.30 S., R.18 E., sec. 34 (Salt Lake Meridian) to Imperial Canyon in T.31 S., R.17 E., sec. 28 (Salt Lake Meridian).

Determination

Due to the potential for further water depletions from the Colorado River Basin, implementation of the RFO RMP is likely to adversely affect the designated critical habitats of the bonytail. If specific projects that incorporate water depletions are proposed during the planning period, the BLM will continue to consult with the U.S. Fish and Wildlife Service.

Habitat Conservation Measures

For projects that cause depletions to the Colorado River system, the BLM will initiate formal consultation with the Service.

Best Management Practices

When developing or improving water source in the Colorado River system, BLM would consider development designs such as water wells and guzzlers rather than surface impoundments to minimize impacts to surface water hydrology resulting from attenuation of flood peaks and evaporative loss.

Humpback chub (*Gila cypha*)

Listing Status: Federal – endangered

Species Description

The humpback chub is a member of the Cyprinidae family, and is distinguishable from other chubs by a pronounced hump that arises above the gills and extends to the origin of the dorsal fin. It has a flattened, concave head; small eyes; subterminal, beak-like mouth; a long snout that protrudes over the lower jaw; and large fins. The humpback chub is grey or olive colored on its back, with silver sides and a white belly. During the spawning season, adults will develop rosy-red fins and gill coverings. Some areas of the Colorado River are turbulent. Consequently, it is believed that the hump causes the humpback chub to be pushed to the bottom where water velocities are lower and where the chub can hold its position without exerting excess energy. Grooves associated with the hump may aid in directing water to the fish's gills (Minckley 1973). The long snout and beak-like mouth may allow the fish to feed without the mouth becoming filled with rushing water. The Humpback chub's diet includes aquatic and terrestrial arthropods, small fishes, diatoms, planktonic crustaceans and algae.

Status and Distribution of Species

The humpback chub is listed as endangered under the Endangered Species Act of 1973. In addition, the humpback chub is listed as endangered by the state of Colorado and it is legally protected by the state of Utah. Historically, the humpback chub was abundant in the canyons of the Colorado River and in the canyons of four tributaries: the Green River, the Yampa River, the White River, and the Little Colorado River. Presently, two stable populations of humpback chubs are known to exist, both near the Colorado/Utah border: Westwater Canyon (Utah) and Black Rocks (Colorado). The largest known population of humpback chubs exists in the Little Colorado River in the Grand Canyon. Smaller populations of humpback chubs can be found in the main stem of the Colorado River (Arizona) and in sections of its tributaries such as the Green River (Utah and Colorado) and the Yampa River near Dinosaur National Monument. The humpback chub does not occur in the RMPPA.

Habitat Associations and Life History Requirements

The humpback chub prefers fast waters in habitats such as the riffles and rapids of river canyons and their tributaries (canyon sections) in the Colorado River basin.

Threats from Human Activity

Water developments and introduced fishes are the primary threats to the viability of humpback chub populations. Providing adequate spring-runoff conditions, establishing additional populations, and the reducing the stocking of non-native trout are all conducive to maintaining viable populations of humpback chub. Both historical water depletions and any new water depletions are likely to negatively affect population and habitat conditions downstream, though assessing the effects on species viability may be difficult.

Environmental Consequences and Viability

The humpback chub is not as abundant as it was historically. Water development and introduced trout have affected the abundance and distribution of the humpback chub. Dams have altered the timing, duration, and magnitude of annual flows that provided suitable and preferable habitats for the humpback chub. Further, non-native trout have affected humpback chub abundance due to predation.

The cumulative effects on the humpback chub due to activities that occur on public and private lands in the upper Colorado River basin (Wyoming, only) are real and they may be measurable. Cumulative effects that may negatively impact this species are the result, primarily, of water developments and water uses in the basin. Also, introduced species such as rainbow trout, are an important component of the cumulative effects; exotic trout tend to prey on young age classes of humpback chubs.

Management Status and Recovery and Conservation Planning

Recovery Plan completed August 19, 1990.

Determination

Due to the potential for further water depletions from the Colorado River Basin, implementation of the RFO RMP is likely to adversely affect the humpback chub. If specific projects that incorporate water depletions are proposed during the planning period, the BLM will continue to consult with the U.S. Fish and Wildlife Service.

Species Conservation Measures

For projects that cause depletions to the Colorado River system, the BLM will initiate formal consultation with the Service.

Best Management Practices

When developing or improving water source in the Colorado system, BLM will consider development designs such as water wells and guzzlers rather than surface impoundments to minimize impacts to surface water hydrology resulting from attenuation of flood peaks and evaporative loss.

Humpback chub (*Gila cypha*) Critical Habitat

Critical Habitat Description

The U.S. Fish and Wildlife Service has designated the following critical habitats for the humpback chub: Yampa River (Moffat Co., CO) from the boundary of Dinosaur National Monument in T.6 N., R.103 W., sec. 27 (6th Principal Meridian) to its confluence with the Green River in T.7 N., R. 103 W., sec. 28 (6th Principal Meridian); Green River (Uintah Co., Utah and Moffat Co., CO) from its confluence with the Yampa River in T.7 N., R.103 W., sec.28 (6th Principal Meridian) to the southern boundary of Dinosaur National Monument in T.6 N., R. 24 E., sec.30 (Salt Lake Meridian); Green River (Uintah and Grand Co., UT)(Desolation and Gray Canyons) from Summers Amphitheater in T.12 S., R.18 E., sec.5 (Salt Lake Meridian) to Swasey's Rapid in T.20 S., R.18 E., sec.3 (Salt Lake Meridian); Colorado River (Grand Co., UT and Mesa Co., CO) from Black Rocks in T.10 S., R.104 W., sec.25 (6th Principal Meridian) to Fish Ford in T.21 S., R.24 E., sec.35 (Salt Lake Meridian); and, Colorado River (Garfield and San Juan Co., UT) from the Brown Betty Rapid in T.30 S., 18 E., sec.34 (Salt Lake Meridian) to Imperial Canyon in T.30 S., R.17 E., sec.28 (Salt Lake Meridian).

Determination

Due to the potential for further water depletions from the Colorado River Basin, implementation of the RFO RMP is likely to adversely affect the designated critical habitats of the humpback chub. If specific projects that incorporate water depletions are proposed during the planning period, the BLM will continue to consult with the U.S. Fish and Wildlife Service.

Habitat Conservation Measures

For projects that cause depletions to the Colorado River system, the BLM will initiate formal consultation with the Service.

Best Management Practices

When developing or improving water source in the Colorado River system, BLM would consider development designs such as water wells and guzzlers rather than surface impoundments to minimize impacts to surface water hydrology resulting from attenuation of flood peaks and evaporative loss.

Blowout Penstemon (*Penstemon haydenii*)

Listing Status: Federal Endangered, September 1, 1987

Species Description

The blowout penstemon is a milky-blue, aromatic, perennial herb with one to many glabrous stems arising from a branched caudex or buried stem nodes. Stems are generally less than 30 cm tall with greenish-blue, waxy, linear to lanceolate, entire leaves 2.5 to 12 cm long and 0.3 to 1 cm wide.

The inflorescence is 6-16 cm long with 6-10 compact, leafy whorls of milky-blue to pale lavender flowers. Floral bracts are broad and heart-shaped at the base and narrow to an elongate tip. Individual flowers are 23-25 cm long with tubular, bi-lobed, and faintly vanilla-scented corollas and glabrous, linear sepals. Anther sacs are 1.8-2 mm long and glabrous. Fruits are a capsule 13-16 mm long with light-brown, disk-shaped seeds.

Life History

This species flowers from May to early-July (mid-June to early-July in Wyoming); probably in response to drier and cooler climatic conditions and produces fruits from late-June to mid-July. Each fruit contains an average of 25–35 seeds. Seeds are released in late-August to September and are often buried in shifting sand and can remain viable for 20 years.

Prolonged wet conditions and abrasion are required for breaking dormancy and seed germination. The plant is primarily an out-crosser (transfers genes from one plant of the same species to another plant of the same or closely related species); although studies show that it is potentially self-fertile (Fertig 2000).

The blowout penstemon is also capable of spreading vegetatively by the production of adventitious roots from buried stems (Barr 1982; Stubbendick et al. 1997). This is an adaptation for surviving burial by wind-blown sands.

The blowout penstemon occurs in “blowouts,” sparsely vegetated depressions in actively shifting sand dunes created by wind erosion. In Wyoming, the blowout penstemon occurs on steep, north-facing slopes of active blowout-like sand dunes with sparse cover of blowout grass (*Redfieldia flexuosa*), thickspike wheatgrass (*Elymus macrouras*), lemon scurfpea (*Psoralea* sp.), and occasional rubber rabbitbrush (*Chrysothamnus nauseosus*). The dunes in Wyoming may be 60-120 feet high and occur at elevations of 6680-7440 feet; much higher elevations than in Nebraska. In addition, the Wyoming populations receive a lower mean annual precipitation and cooler maximum and minimum summer temperatures. Plants are not evenly distributed throughout their habitat, but are found in sparse, non-random clusters (Fertig 2000).

Population Distribution

There are two known endemic populations of the blowout penstemon in the United States, one in the sand hills of west-central Nebraska and the second in the northeastern Great Divide Basin in Carbon County, Wyoming. Currently, only 3,500–5,000 plants are found in Nebraska at approximately 13 sites. The first record of blowout penstemon in Wyoming comes from an undated collection made by the Hayden expedition and attributed to the “Laramie Mountains” by Watson (1891). Pennell (1920) noted that this specimen was possibly misidentified. Later, Pennell (1935) reported that a presumed duplicate of Hayden’s specimen at the Missouri Botanical Garden was labeled “Loup Fork”, a site in the Nebraska Sand Hills. Much of the confusion regarding Hayden’s whereabouts stems from the assumption of Pennell (1920, 1935) that the *P. haydenii* collections from the Missouri Botanical Garden and Gray Herbarium are duplicates, when in fact, they probably represent different collections separated by 20 years and several hundred miles (Fertig, 2000). The Wyoming populations were later re-discovered in 1996 and 2000. In July of 1999, samples were collected from the Bradley Peak population in full bloom and identification was confirmed by the New York Botanical Garden and the University of Nebraska.

Field Office Distribution

The Wyoming populations are known from two locations: (1) Bear Mountain-Junk Hill; and (2) Bradley Peak. The Bradley Peak population is limited to an area of about 20 acres in northern Carbon County and contains 300-500 plants. The Bear Mountain-Junk Hill population covers approximately 100 acres in northern Carbon County and contains 3950-5540 plants. These populations are subdivided into nine subpopulations that occupy about 120 acres within a five square mile area occurring mostly on BLM and State administered lands.

Reproduction and Survivorship

No long-term trend data is available on the Wyoming population however survey data on two subpopulations have been collected from 2000 through 2003.

The cause of the sharp decline in the Nebraska population is also unknown, although wildfire control, severe drought, improvements in range management, leveling of sand dunes, and outbreaks of pyralid moths have all been identified as causes (Fertig, 2000).

Some evidence indicated drought might be the primary threat to the existence of the species. In years with lower than normal precipitation or in the end period of intensive grazing, livestock have been observed to closely graze almost every available plant when more favorable forage is limited. Studies in Nebraska have found that livestock grazing is rarely a threat to blowout penstemon, although the flowering stalks may be eaten occasionally by deer and elk (Stubbendieck et al, 1997). Grazing could be a management tool to help maintain blowout habitat by reducing sand dune vegetation (Fertig, 1999).

Sand mining near Ferris Mountains occurs near the recreational area along Seminole Road near Seminole Reservoir. Sand removed from the area is used mainly for golf courses. Mining in habitats of known populations is not feasible due to the isolated and rugged terrain where known populations are found.

Oil and gas exploration and development have the potential to negatively impact the plants' habitat. However, leasing activities within penstemon habitats would be avoided and companies would be required to move pads to adjacent areas and drill diagonally.

Invasive and noxious weeds have the potential to threaten habitat and populations of penstemon due to competition with weeds. Weed control activities would affect the penstemon depending on how, with what pesticide, and where it is done, and the use of pesticides could have the potential to negatively affect the penstemon's pollinators.

OHV activity may have both beneficial and negative impacts to penstemon and its habitat. OHV activities may ensure continued soil disturbance and erosion possibly creating new habitat; however, driving over plants could cause mortality.

Management Status Recovery and Conservation Planning

A recovery plan for blowout penstemon was prepared by Michael Fritz of Nebraska Game and Parks commission, James Stubbendieck, Ph.D. of University of Nebraska and Wallace Jobman of U.S. Fish and Wildlife Service for Region 6 U.S. Fish and Wildlife Service Denver, Colorado on July 17, 1992. However this plan has not been revised to incorporate the Wyoming populations. This plan's recovery criteria to down list the species from endangered to threatened is as follows:

A minimum of 10,000 individuals in at least 5 population groups is established; and

The five populations have the minimum level of protection that will ensure their continued existence.

To be considered for delisting when: (1) a minimum of 15,000 individuals in at least 10 population groups, each with a minimum population of 300 plants is established; and (2) the 10 populations are demonstrated to be at minimum viable population levels.

A "Penstemon Haydenii (Blowout Penstemon) Conservation Agreement, Assessment, and Strategy" is in draft stages for Wyoming at this time and is expected to be finalized in the near future. The conservation objectives of this agreement include the following: (1) Follow established land management policies and

regulations which provide for long-term protection of *Penstemon haydenii*; (2) Conduct surveys and inventories to locate and monitor populations of the species; (3) Monitor populations and conduct research to determine species life history, minimum viable population parameters, habitat requirements, and management criteria; (4) Initiate land exchanges or protection on state lands; (5) Prevent and alleviate negative impacts on management actions; (6) Protect from international trade and commercial exploitation; (7) Reintroduce or introduce populations in suitable habitats; (8) Protect naturally occurring, reintroduced, and introduced populations and their habitats; (9) Maintain seed source and genetic variability in an artificial seed bank; and (10) Carry out public education to develop awareness and support for the preservation of the species.

The following habitat conservation measures and species conservation measures will be implemented within the RFO in areas where there is the potential for the blowout penstemon plant to occur.

Habitat Conservation Measures

Known habitat for the blowout penstemon plant will be open to oil and gas leasing with a NSO stipulation.

Surface disturbing activities will be intensively managed within identified populations to maintain or enhance habitat for the plant. Intensive management may vary from year to year and includes the use of proper distance restrictions, seasonal or timing restrictions, rehabilitation standards, use of BMPs for livestock grazing, rotational grazing, or fencing, as identified in permit authorizations.

Identified habitat for the blowout penstemon plant will be closed to new locatable mineral entry and mineral material sales. Withdrawals will be pursued.

Species Conservation Measures

Habitat that contains known populations of the blowout penstemon plant will be designated as an ACEC and managed as an endangered plant habitat area.

Best Management Practice

Management practices identified on a case-by-case basis would be applied to surface disturbing activities to maintain or enhance blowout penstemon plant habitat.

Off-road vehicle travel for “necessary tasks” in identified habitat for the blowout penstemon plant will not be allowed to protect the plant. Exceptions may be authorized on a case-by-case basis following environmental assessment.

Collect and bank blowout penstemon plant seed at local and regional arboreta, seed banks, and botanical gardens, including the Denver Botanical Garden and the Cheyenne Botanical Garden, as insurance against catastrophic events, for use in biological studies, and for possible introduction into new habitat.

Restrict mining of salable and existing locatable minerals, where populations of the blowout penstemon plant have been located.

Actively pursue land tenure adjustments, including acquisition of lands, easements, or exchange, to meet ACEC management objectives.

Fire suppression activities will be utilized to maintain early successional plant communities.

Colorado Butterfly Plant – (*Guara neomexicana coloradensis*)

Listing Status: Federal threatened, November 17, 2000

The USFWS listed the Colorado butterfly plant as threatened in 2000 (USFWS 2000). At the time of listing (USFWS 2000), the USFWS had not designated critical habitat; however, at this time Critical Habitat has been designated and is discussed below.

Species Description

The Colorado butterfly plant has one or a few reddish, hairy stems that are 2-3 feet (50-80 cm) tall. The lower leaves are lance-shaped with smooth or wavy-toothed margins and average 2-6 inches (5-15 cm) long, while those on the stem are smaller or reduced in number. Flowers are arranged in a branched, elongate pattern above the leaves. Only a few flowers are open at any one time and these are located below the rounded buds and above the mature fruits.

Individual flowers are ¼ inch to ½ inch (5-14 millimeters) long with four reddish sepals and four white petals that turn pink or red with age. The hard, nutlike fruits are 4-angled and have no stalk.

Life History

The Colorado butterfly plant is a short-lived perennial herb. Flowering occurs from late-June or early-July until the first hard frost of fall (usually mid-September to early-October). The plant lives vegetatively for several years before bearing fruit once and then dying. Fruit is present from late-July to early-October. It reproduces only by seed. Plants are self-fertile, but also outcross. Flowers open at dusk and are pollinated by moths (Fertig 2001).

This plant typically occurs on sub-irrigated, alluvial soils on level or slightly sloping floodplains and drainage bottoms at elevations of 5000-6400 feet (1524 to 1951 m). Colonies are often found in low depressions or along bends in wide meandering stream channels. Most populations are found a short distance from the actual channel and may even occur at the base of low, alluvial ridges at the interface between riparian meadows and drier grasslands. This plant occurs on soils derived from conglomerates, sandstones, and tuffaceous mudstones and siltstones of the Tertiary Wind River, Arikaree, and Ogalalla formations (Fertig 2001). The plant requires early- to mid-succession riparian habitat. It commonly occurs in communities dominated by *Agrostis stolonifera* (redtop) and *Poa pratensis* (Kentucky bluegrass) on wetter sites, and *Glycyrrhiza lepidota* (wild licorice), *Cirsium flodmanii* (Flodman's thistle), *Grindelia squarrosa* (curlycup gumweed) and *Equisetium laevigatum* (smooth scouring rush) on drier sites.

Both of these habitat types are usually intermediate in moisture between wet, streamside communities dominated by sedges, rushes, and cattails, and dry, upland shortgrass prairie. Typical Colorado butterfly plant habitat is open, without dense or overgrown vegetation. Properly functioning riparian systems provide conditions favorable for establishment and maintenance of riparian-dependent species such as this plant.

Population Distribution

Prior to 1984, no extensive documentation of the plant's range had been conducted. The Colorado butterfly plant is a regional endemic of southwestern Nebraska, southeastern Wyoming, and northeastern Colorado. In Wyoming, the Colorado butterfly plant is known only from the southeastern plains in Laramie and Platte Counties between the boundary of the Medicine Bow National Forest and the

Wyoming-Nebraska border. Recent surveys in Wyoming suggest that extant populations are probably stable, although population sizes may vary from year to year (Fertig 2001).

Field Office Distribution

There are documented populations of the Colorado butterfly plant located within the RFO area. Two of the populations are located at F.E. Warren Air Force Base, in Cheyenne, Wyoming. Other populations within the RFO area are located on private lands, between the Medicine Bow National Forest boundary (Pole Mountain) and the Wyoming-Nebraska border on Middle Crow Creek, North Fork Crow Creek, South Branch Crow Creek, Lodgepole Creek, and Horse Creek. There are three small populations that are found partly or fully on Wyoming state school trust lands, which are managed mostly for agricultural uses. Most of the plant population locations of Colorado butterfly plant that are known to occur exist on private lands. No populations are known to occur on BLM-administered federal lands in the RFO area.

Reproduction and Survivorship

The Colorado butterfly plant is an early successional species (not a pioneer species) adapted to periodically disturbed stream channel sites. Historically, flooding was probably the main cause of disturbance in the plant's habitat, although wildfire and grazing also may have been important (Fertig, 1996).

In general, threats to the species across its range include the following: (1) haying; (2) grazing; (3) herbicide spraying; and (4) urban expansion. Fertig (2001) suggests the primary threat may be vegetative succession in the absence of periodic disturbances that makes habitat unsuitable for seedling establishment. Other threats to the Colorado butterfly plant are the spraying of broadleaf herbicides, agricultural conversion of riparian areas, water diversions, channelization, and urban development.

Competition from non-native invasive plants can be a significant threat to the Colorado butterfly plant. Invasive species can out-compete the Colorado butterfly plant and reduce population numbers. Efforts to control Canada thistle, leafy spurge, and other invasive species with chemicals can pose a direct threat to the species. In addition, many chemicals are restricted for use within riparian zones. Invasive species are often spread by livestock management and recreational activities, but can also be spread by other land uses and management activities.

Management Status Recovery and Conservation Planning

There are no management recovery or conservation plans for this species within the RMPPA. The following habitat conservation measures and species conservation measures will be implemented within the RFO in areas where there is the potential for the Colorado butterfly plant to occur.

Habitat Conservation Measures

Known habitat for the Colorado butterfly plant will be open to oil and gas leasing with a NSO stipulation. Construction of surface disturbing activities will be prohibited where the NSO is applicable.

Grazing will be intensively managed within known habitat containing populations from July through August to allow plants to bloom and go to seed.

Recreational site development will not be authorized in known Colorado butterfly plant habitat.

Species Conservation Measures

Place mineral supplements, hay, or other feeds for livestock at least ½ mile from known occupied Colorado butterfly plant habitat.

Projects that alter the natural hydrology, change the vegetation of riparian ecosystem, or may cause direct ground disturbance will be redesigned to ensure that adverse affects to the plant do not occur.

Best Management Practices

Maintain and restore the dynamics of stream systems, including the movement of streams within their floodplains, which are vital for the life cycle of this plant. Flow timing, flow quantity, and water table characteristics should be evaluated to ensure that the riparian system is maintained where these plants occur.

Prescribed fire and grazing activities shall be coordinated between biologists, rangeland management specialists, and fire personnel to ensure that no damage occurs to the plant habitat when being used to maintain the habitat for the species.

Maintain and restore the natural species composition and structural diversity of plant communities in riparian zones and wetlands.

Recreational foot trails that may be located adjacent to Colorado butterfly plant habitat should be constructed to reduce impacts to this species.

The BLM should continue water use in a manner that maintains suitable habitat for the Colorado butterfly plant to benefit the species.

The BLM will develop and implement a monitoring plan in known and potential habitat, which will include population trends, and participate in the species recovery plan.

Collect and bank Colorado butterfly plant seed at local and regional arboreta, seed banks, and botanical gardens, including the Denver Botanical Garden and the Cheyenne Botanical Garden, as insurance against catastrophic events, for use in biological studies, and for possible introduction into new habitat.

Colorado Butterfly Plant Critical Habitat

Listing Status: Critical Habitat identified September 2004

Species Description

Critical habitat identified specific areas, both occupied and unoccupied, that are essential to the conservation of a listed species and that may require special management considerations or protection. Critical habitat for the Colorado butterfly plant receives protection under section 7 of the ESA through the prohibition against destruction or adverse modification of critical habitat with regard to actions carried out, funded, or authorized by a Federal agency. Section 7 also requires consultation with the USFWS on federal actions that are likely to result in the destruction or adverse modification of proposed critical habitat. Critical habitat identified by the USFWS must be essential to the conservation of the species and are areas that provide essential life cycle needs of the species. Not all areas that can be occupied by a species will be designated critical habitat. The USFWS designates those areas as critical habitat only if they are essential for that species.

Habitat is dynamic, and a species may move from one area to another over time. Designation of critical habitat may not include all habitat eventually determines as necessary to recover the species. Critical habitat designations do not signal that habitat outside the critical habitat designation is unimportant or may not be required for recovery. Areas outside the critical habitat designations will continue to be subject to conservation actions that may be implemented under section 7 and section 9 of the ESA (USFWS, 2002).

Life History

The life history of the Colorado butterfly plant is described above; this section discusses critical habitat, as identified and authorized by the USFWS, for the plant. Critical Habitat is defined in Section 3(5)(A) of the ESA as: 1) the specific areas within the geographic area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features essential to conserve the species and that may require special management considerations for protection; and 2) specific areas outside the geographic area occupied by a species at the time it is listed, upon determination that such areas are essential to conserve the species. The USFWS defines conservation as the use of all methods and procedures that are necessary bring an endangered or threatened species to the point at which listing under the ESA is no longer necessary (USFWS, 2002).

Population Distribution

Critical habitat units include only river and stream reaches, and adjacent floodplains, that are within Laramie County, Wyoming, for the Colorado butterfly plant, have the primary constituent elements present, and based on the best available scientific information, are believed to currently support the plant.

Field Office Distribution

At this time there is no identified Critical Habitat for the Colorado butterfly plant located on BLM administered lands within the RMPPA.

Reproduction and Survivorship

There are no management recovery or conservation plans for this species within the RMPPA. The following habitat conservation measures and species conservation measures will be implemented within the RFO in areas where there is the potential for the Colorado butterfly plant to occur.

Management Status Recovery and Conservation Planning

The regulations identified in the Federal Register Volume 69, Number 185, September 24, 2004, Proposed Rules will be followed concerning management of activities that are located, or have the potential to be located, within critical habitat for the Colorado butterfly plant.

Habitat Conservation Measures

Designated critical habitat for the Colorado butterfly plant will be open to oil and gas leasing with a NSO stipulation. Construction of surface disturbing activities will be prohibited where the NSO is applicable.

Grazing will be intensively managed within designated critical habitat containing populations from July through August to allow plants to bloom and go to seed.

Recreational site development will not be authorized in designated critical habitat for the Colorado butterfly plant.

Species Conservation Measures

Place mineral supplements, hay, or other feeds for livestock at least ½ mile from designated critical habitat for the Colorado butterfly plant.

Projects that alter the natural hydrology, change the vegetation of riparian ecosystem, or may cause direct ground disturbance will be redesigned to ensure that adverse affects to the designated critical habitat do not occur.

Best Management Practices

Maintain and restore the dynamics of stream systems, including the movement of streams within their floodplains, which are vital for the life cycle of this plant. Flow timing, flow quantity, and water table characteristics should be evaluated to ensure that the riparian system is maintained within designated critical habitat.

Prescribed fire and grazing activities shall be coordinated between biologists, rangeland management specialists, and fire personnel to ensure that no damage occurs to the designated critical habitat when being used to maintain the habitat for the species.

Maintain and restore the natural species composition and structural diversity of plant communities in riparian zones and wetlands.

Recreational foot trails that may be located adjacent to designated critical habitat for the Colorado butterfly plant should be constructed to reduce impacts to this habitat.

The BLM should continue water use in a manner that maintains critical habitat for the Colorado butterfly plant to benefit the species.

The BLM will develop and implement a monitoring plan in designated critical habitat, which will include population trends, and participate in the species recovery plan.

Ute Ladies'-Tresses (*Spiranthes diluvialis*)

Listing Status: Federal Threatened, February 1992

Species Description

The Ute ladies'-tresses orchid is a perennial, terrestrial orchid with erect, glandular-pubescent stems 8 to 20 inches (12 to 50 cm) tall arising from tuberous-thickened roots. Its narrow leaves are about 11 inches (28 cm) long at the base of the stem and become reduced in size going up the stem. This species flowers from late- July to September. Plants probably do not flower every year and may remain dormant below ground during drought years. The flowers consist of 3 to 15 small white to ivory colored flowers clustered into a spike arrangement at the top of the stem. Whitish, stout, spirally arranged flowers characterize the species. The sepals and petals, except for the lip, are rather straight, although the lateral sepals are variably oriented, with these often spreading abruptly from the base of the flower. Sepals are sometimes free to the base. The lip lacks a dense cushion of trichomes on the upper surface near the apex. The rachis is sparsely to densely pubescent with the longest trichomes 0.008 inches (0.2mm) long or longer.

Life History

This plant typically blooms from late-July through August, in some cases through September. Blooms were recorded as early as early-July and as late as early-October. Reproduction is strictly sexual. Reproductively mature plants do not flower every year. These plants may take 5-10 years to reach reproductive maturity.

The Ute ladies'-tresses orchid is endemic to moist soils in mesic or wet meadows, subirrigated or seasonally flooded soils in valley bottoms, gravel bars, old oxbows, or floodplains bordering springs, lakes, rivers, or perennial streams between 1,780 and 6,800 feet in elevation (542 to 2074 m) (Fertig and Beauvais 1999). The species occurs primarily in areas where the vegetation is relatively open and not overly dense, overgrown or overgrazed. Populations have been documented from alkaline sedge meadows, riverine floodplains, flooded alkaline meadows adjacent to ponderosa pine-Douglas fir woodlands, sagebrush steppe, and streamside floodplains.

Known sites of this species often have low vegetative cover and may be subjected to periodic disturbances (e.g., flooding or grazing). Populations are often dynamic and shift within a watershed as disturbances create new habitat or succession eliminates old habitat (Fertig and Beauvais 1999). The Ute ladies'-tresses orchid is well adapted to disturbances from stream movement and is tolerant of other disturbances, such as light grazing, that are common to grassland riparian habitats and reduce competition between the orchid and other plants (USFWS 1995). It is known to establish in heavily disturbed sites, such as re-vegetated gravel pits, heavily grazed riparian edges and along well-traveled foot trails (USFWS 1995).

Population Distribution

The Ute ladies'-tresses orchid is known to occur from western Nebraska, southeastern Wyoming, north-central Colorado, northeastern and southern Utah, east-central Idaho, southwestern Montana, and north-central Washington (Moseley 1998). The total population is approximately 20,500 individuals.

In Wyoming, Ute ladies'-tresses populations are presently known from four locations. Fertig, in 1998-99, revisited all four populations and documented 800-1200 individuals in a total area of less than ten acres. Most of the populations in Wyoming occur in moist meadow communities dominated by redbud (*Agrostis stolonifera*), Baltic rush (*Juncus balticus*), switchgrass (*Panicum virgatum*), and foxtail barley (*Hordeum jubatum*) within a narrow band between emergent aquatic vegetation and adjacent dry upland prairie. Vegetative cover is typically 75-90%, but is usually short (under 45 cm tall) (Fertig, 2000). The only exception is the Converse County population which is associated with a cattail marsh, among tall, dense grasses.

Field Office Distribution

The Ute ladies'-tresses occur at four locations in Wyoming, one of these is in the Rawlins Field Office in Laramie County on private lands. The Goshen County population occurs on state and public land just north of the RFO administrative boundary within the BLM Casper Field Office administrative boundary. BLM-authorized searches (1994-2001) for the species have been performed at several locations in Wyoming with no additional populations being located. To date, no populations of Ute ladies'-tresses are known to occur on public lands within the RFO.

Reproduction and Survivorship

The species is threatened primarily by habitat loss and modification, though its small populations and low reproductive rate make it vulnerable to other threats. The riparian and wetland habitats required by this

species have been heavily impacted by urban development, heavy grazing, stream channelization, water diversions, and other watershed and stream alterations that reduce the natural dynamics of the stream system, recreation, and invasion of habitat by exotic plant species (USFWS, 1995).

Wyoming's populations of Ute ladies'-tresses are largely unthreatened under current management, but could become vulnerable by changes in land uses (Fertig, 2000). The following potential threats have been identified in the literature that may affect survivorship: (1) urbanization; (2) grazing; (3) mowing; (4) flood control; (5) pesticide use; (6) competition from introduced weeds; (7) natural herbivory; (8) loss of pollinators; (9) recreation; and (10) over-collection.

The effects of grazing are largely unknown. The largest populations of the species, in Utah and Colorado, are grazed during the winter, when it is dormant, with no noticeable effect on the species. It is plausible that moderate winter grazing may be beneficial to the species.

Due to the low reproductive rate, any loss of individual plants due to collection could have a major effect on the species' survival. If individual plants or flowers were collected, it could adversely impact the reproductive potential of the affected population significantly.

Management Status Recovery and Conservation Planning

There are no management recovery or conservation plans for this species within the RMPPA. The Ute Ladies'-tresses Agency Review Draft Recovery Plan was completed in 1995 and seeks to address the plant recovery by maintaining and restoring ecological processes that create and maintain good orchid habitat. The RFO biologists recognize and use this draft plan.

The following habitat conservation measures and species conservation measures will be implemented within the RFO in areas where there is the potential for the Ute ladies'-tresses plant to occur.

Habitat Conservation Measures

Known habitat for the Ute ladies'-tresses plant will be open to oil and gas leasing with a NSO stipulation. Construction of surface disturbing activities will be prohibited where the NSO is applicable.

Grazing will be intensively managed within identified populations from July through September to allow plants to bloom and go to seed.

Recreational site development will not be authorized in known Ute ladies'-tresses plant habitat.

Species Conservation Measures

Place mineral supplements, straw or other feeds for livestock at least ½ mile from known occupied Ute ladies'-tresses habitat.

Projects that alter the natural hydrology, change the vegetation of riparian ecosystem, or cause direct ground disturbance would be redesigned to ensure that adverse affects to the plant do not occur.

Best Management Practices

Maintain and restore the dynamics of stream systems to benefit Ute ladies'-tresses, including the movement of streams within their floodplains, which are vital for the life cycle of this plant. Flow timing, flow quantity, and water table characteristics should be evaluated to ensure that the riparian system is maintained where these plants occur.

Prescribed fire and grazing activities shall be coordinated between biologists, rangeland management specialists, and fire personnel to ensure that no damage occurs to the plant habitat when being used to maintain the habitat for the species.

Maintain and restore the natural species composition and structural diversity of plant communities in riparian zones and wetlands.

Recreational foot trails that may be located adjacent to Ute ladies'-tresses plant habitat should be constructed to reduce impacts to this species.

The BLM should continue water use in a manner that maintains suitable habitat for the Ute ladies'-tresses orchid to benefit the species.

The BLM should development and implement a monitoring plan in known and potential habitat, which will include population trends, and participate in the species recovery plan.

Collect and bank Ute ladies'-tresses plant seed at local and regional arboreta, seed banks, and botanical gardens, including the Denver Botanical Garden and the Cheyenne Botanical Garden, as insurance against catastrophic events, for use in biological studies, and for possible introduction into new habitat.

Analysis of the Effects of the Actions

The RFO RMP Draft EIS was reviewed to identify actions with potential to affect the listed species in the RFO planning area. The USFWS, Cheyenne, Wyoming and BLM RFO conferred for additional information on each species and actions occurring within the RMPPA area. In some cases, ground surveys and inventories have been conducted by BLM, USFWS, WYNDD, WGFD, and other consultants as part of other planning documents; and species recovery plans also were reviewed for further information on habitat, occurrences, life histories, and conservation measures.

Activity Description

Each major resource activity occurring on the public lands in the planning area where management prescriptions may affect listed species are identified in the following discussions and are located in Table 7.

Effects Analysis

The BA analyzes the impacts of a proposed, discretionary federal action. A federal action is defined as anything authorized, funded, or carried out by the federal agency. Direct impacts are those effects on the species or its habitat which are caused by an action, and occur at the same time and place as the action. Indirect impacts are those effects on the species or its habitat caused by an action, occurring later in time or further removed in distance than direct impacts, but which are still reasonably foreseeable. The analysis of all impacts includes the effects of interrelated and interdependent actions.

For the purposes of effects analysis under the ESA, cumulative effects are defined as effects on a species caused by other projects and activities unrelated to the action under consideration, and effects of future state or private activities not involving federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation. Future federal actions will be subject to the consultation requirements established in Section 7 of the ESA, and therefore, are not considered cumulative to the proposed action.

Factors considered when analyzing impacts include, among others: proximity of the action to the species or habitat of concern, geographic distribution of the action disturbance, timing of the action, nature of the action effect, action disturbance frequency, duration of the affecting action, action disturbance intensity, and action disturbance severity.

The BA process is focused primarily on adverse impacts to the species of concern. Even though impacts may have both a beneficial and detrimental effect on the subject species in either the long or short term, the effects determination of the assessment will be based on and controlled by the likelihood of adversely affecting the species. The impact analysis is not an averaging process.

Effects Determinations

The following determinations will be made following the BLM analysis of project activities as they affect each T&E and Special Status species. The determination categories located in table 1 are considered a part of this BA and include the following:

Threatened and Endangered Species

- No effect (NE)—The appropriate conclusion when the BLM RFO determines its proposed action will not affect listed species. The principle factor for this determination is that “suitable habitat” does not exist for the species in the area where the activity would occur.
- May affect, but is not likely to adversely affect (NL-b, -i, -d)—The appropriate conclusion when effects on listed species are expected to be discountable (-d), or insignificant (-i), or completely beneficial (-b). This type of effect requires informal Section 7 consultation with the USFWS and concurrence with the determination.
 - NL-b indicates that actions that result in this determination will have only beneficial impacts for the species.
 - NL-i indicates that actions that result in this determination will be so small or immeasurable that it would be considered insignificant.
 - NL-d indicates that actions that result in this determination will be so rare as to be considered discountable.
- Where further details are appropriate concerning these effects and determinations see the “Analysis of Management Actions and Effects Determinations” section. Individual determinations of analysis and effects determinations will be done on a case-by-case basis for individual projects.

(May affect, is likely to adversely affect (LAA)—The appropriate conclusion if any adverse effect to the listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial. In the event the overall effect of the proposed action is beneficial to the listed species, but also is likely to cause some adverse effects, then the proper effect determination for the proposed action “is likely to adversely affect” the listed species. An “is likely to adversely affect” determination requires formal section 7 consultation with the USFWS.

Proposed Species (includes Nonessential Experimental Populations)

- Is not likely to jeopardize proposed species (NJ)—the appropriate conclusion when the action agency identifies situations in which the proposed action is not likely to jeopardize the continued

existence of the proposed species. If this determination were reached, informal conference with the USFWS would be conducted on a case-by-case basis.

- Is likely to jeopardize proposed species (LJ)—the appropriate conclusion when the action agency identifies situations in which the proposed action is likely to jeopardize the continued existence of the proposed species. If this determination is reached, formal conference with the USFWS is required.

Candidate and BLM Sensitive Species

The ESA, Section 7 consultation process is not required for candidate species. However, since the three species identified above as candidate species may eventually become proposed or listed, there are advantages to addressing these candidate species as though they were already proposed for listing. Early technical coordination with the USFWS will also yield some collaborative management advantages. For these reasons, these species are included in this BA and will be analyzed as appropriate.

For the purposes of requesting technical assistance from the USFWS for the proposed action, the following language for Candidate and BLM sensitive species Effects Determinations will apply:

- No Impact (NI)—The appropriate conclusion when the BLM determines its proposed action will not impact candidate and BLM sensitive species or their essential habitat. This is based on the fact that the species habitat is not present and/or the impact would be so minimal in size that the species would not be affected. If this determination is reached, no coordination with the USFWS is apt to occur.
- May Impact, but not likely to contribute to the need for federal listing (MI)—the appropriate conclusion when the BLM identifies situations in which the proposed action is likely to have an impact on individuals, but will not likely impact the continued existence of the candidate and BLM sensitive species, either local or range-wide populations, and would not contribute to the need for the species to become listed under the ESA. If this conclusion is reached, coordination with the USFWS may be appropriate.

The BLM staff has reviewed potential actions associated with each program and the impacts to the individual species or their critical habitats to determine the impact to the species or their critical habitats, if those actions were to occur within suitable habitat for those species. Table 7, below, lists potential activities and associated effect determinations of each BLM action on the individual species or habitat.

This BA will describe in detail those potential actions that may affect listed species or its critical habitat. Other potential actions that have been determined to have no effect on a species or its critical habitat will not be further discussed in detail. Projects and/or activities that have a no effect determination (see table 7) have been found to not occur within species' habitat. In addition, projects and/or activities that will not impact (NI) candidate and BLM sensitive species or their essential habitat will not be discussed. Programs that do not have actions located within the habitat of a listed species have been identified as having "No Effect" on that species or its critical habitats.

The black-footed ferret population in the Shirley Basin is a non-essential experimental population and all program activities are determined to have *No Jeopardy (NJ)* on this species. Since this is an experimental population any activities associated with resource programs would not jeopardize this population.

Table 7. Biological Assessment on the Affects of BLM Actions within the Rawlins Field Office on Species Listed Under the ESA

Biological Assessment on the Affects of Bureau of Land Management actions within the Rawlins Field Office on Species listed under the Endangered Species Act	Black-footed Ferret (general population)	Black-footed Ferret (Shirley Basin Unit)	Prairie's Meadow Jumping Mouse (PMJ)	PMJ Critical Habitat	Canada Lynx	Bald Eagle	Western Yellow-billed Cuckoo	Wyoming Toad	Western Boreal Toad	Platte River Species Water Depletion	Colorado River Species Water Depletion	Blowout Penstemmon	Colorado Butterfly Plant (CBP)	CBP Critical Habitat	Ute Ladies'-Tresses
Air Quality															
Collect meteorological and/or air quality data	NL-i	NJ	NE	NE	NE	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Apply dust control measures	NL-i	NJ	NE	NE	NE	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Cover conveyors at mine sites	NL-i	NJ	NE	NE	NE	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Cultural															
Record cultural resources (including excavation)	NL-i	NJ	NL-i	NL-i	NL-d	NL-i	NI	NL-i	NI	NE	NE	NL-i	NL-i	NL-i	NL-i
Inventory cultural resources	NL-i	NJ	NL-i	NL-i	NL-d	NL-i	NI	NL-i	NI	NE	NE	NL-i	NL-i	NL-i	NL-i
Develop interpretive sites	NL-d	NJ	NL-d	NE	NL-d	NL-i	NI	NL-d	NI	NE	NE	NL-d	NL-d	NL-d	NL-d
Use hand tools, power tools, heavy machinery (surface disturbing)	NL-i	NJ	NL-d	NE	NL-i	NL-i	NI	NL-d	NI	NE	NE	NL-d	NL-d	NL-d	NL-d
Stabilize deteriorating buildings/resources	NL-i	NJ	NL-d	NE	NL-i	NL-i	NI	NL-d	NI	NE	NE	NL-d	NL-d	NL-d	NL-d
Fence cultural resources	NL-i	NJ	NL-d	NL-i	NE	NL-i	NI	NL-d	NI	NE	NE	NL-d	NL-d	NL-i	NL-d
Temporary campsites	NL-d	NJ	NL-d	NL-d	NE	NL-d	NI	NE	NI	NE	NE	NE	NE	NE	NE
Fire and Fuels Management															
Fire suppression	NL-d	NJ	NL-i	NL-i	NL-i	NL-i	NI	NL-d	NI	LAA	LAA	NL-i	NL-i	NL-i	NL-i
Damage rehabilitation	NL-i	NJ	NL-i	NL-i	NL-i	NL-d	NI	NL-d	NI	NE	NE	NL-i	NL-d	NL-d	NL-d
Prescribed burning	NL-i	NJ	LAA	LAA	NL-d	NL-i	NI	NL-d	NI	LAA	LAA	NL-b	NE	NE	NE
Construct firelines	NL-d	NJ	NL-i	NL-i	NL-d	NL-i	NI	NL-i	NI	LAA	LAA	NL-d	NL-i	NL-i	NL-i
Use off road vehicles	NL-d	NJ	NL-i	NL-i	NL-d	NL-d	NI	NL-i	NI	NE	NE	NL-d	NL-i	NL-i	NL-i
Use hand tools and heavy equipment	NL-d	NJ	NL-d	NL-d	NL-d	NL-d	NI	NL-d	NI	NE	NE	NL-i	NL-d	NL-d	NL-d
Use chemical fire suppression agents (ground based)	NL-d	NJ	NE	NE	NL-i	NL-d	NI	NL-d	NI	LAA	LAA	NL-i	NL-i	NL-i	NL-i
Fire retardant drops containing chemical dyes (aircraft dispersal)	NE	NJ	NE	NE	NL-i	NL-i	NI	NL-d	NI	LAA	LAA	NL-i	NL-i	NL-i	NL-i

Biological Assessment on the Affects of Bureau of Land Management actions within the Rawlins Field Office on Species listed under the Endangered Species Act	Black-footed Ferret (general population)	Black-footed Ferret (Shirley Basin Unit)	Prairie's Meadow Jumping Mouse (PMJ)	PMJ Critical Habitat	Canada Lynx	Bald Eagle	Western Yellow-billed Cuckoo	Wyoming Toad	Western Boreal Toad	Platte River Species Water Depletion	Colorado River Species Water Depletion	Blowout Penstemon	Colorado Butterfly Plant (CBP)	CBP Critical Habitat	Ute Ladies'-Tresses
Forest Management															
Rehabilitations surveys	NL-d	NJ	NE	NE	NE	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Timber harvesting	NL-d	NJ	NL-d	NL-d	NL-i	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Artificial regeneration (planting harvested areas, including new seedlings)	NL-d	NJ	NL-d	NL-d	NL-i	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Fencing regenerated areas	NE	NJ	NE	NE	NE	NL-i	NI	NE	NI	NE	NE	NE	NE	NE	NE
Clear cuts (including stand replacement)	NL-d	NJ	NE	NE	NL-i	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Selective cutting	NL-d	NJ	NE	NE	NL-b	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Slash disposal	NL-d	NJ	NE	NE	NL-b	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Site regeneration (natural)	NL-d	NJ	NE	NE	NL-b	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Precommercial thinning	NL-d	NJ	NE	NE	NL-i	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Firewood, posts, poles, Christmas trees, wildings	NL-i	NJ	NL-i	NE	NL-i	LAA	NI	NE	NI	NE	NE	NE	NE	NE	NE
Commercial thinning	NE	NJ	NE	NE	NL-b	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Skidder-type yarding	NE	NJ	NE	NE	NL-i	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Logging operations	NE	NJ	NL-i	NE	NL-i	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Cable yarding	NE	NJ	NL-d	NE	NL-i	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Road and landing construction	NL-i	NJ	NL-i/d	NL-i/d	NL-i	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Shearing	NE	NJ	NE	NE	NL-i	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Install drain culverts, water bars, or ditches	NL-d	NJ	NL-d	NL-d	NL-i	NE	NI	NE	MI	NE	NE	NE	NE	NE	NE
Cut and remove diseased trees	NE	NJ	NE	NE	NL-b	NL-d	NI	NE	NI	NE	NE	NE	NE	NE	NE
Slash lopped, scattered, roller chopped, or burned	NL-i	NJ	NL-d	NE	NL-b	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Helicopter logging	NE	NJ	NE	NE	NL-i	NL-d	NI	NE	NI	NE	NE	NE	NE	NE	NE
Disease treatment sprays	NL-d	NJ	NL-d	NL-d	NL-i	NL-d	NI	NE	MI	NE	NE	NE	NE	NE	NE
Lands and Reality															
Establish withdrawals	NL-b	NJ	NL-b	NL-b	NL-b	NL-b	NI	NL-b	NI	NE	NE	NL-b	NL-b	NL-b	NL-b

Biological Assessment on the Affects of Bureau of Land Management actions within the Rawlins Field Office on Species listed under the Endangered Species Act	Black-footed Ferret (general population)	Black-footed Ferret (Shirley Basin Unit)	Preble's Meadow Jumping Mouse (PMJ)	PMJ Critical Habitat	Canada Lynx	Bald Eagle	Western Yellow-billed Cuckoo	Wyoming Toad	Western Boreal Toad	Platte River Species Water Depletion	Colorado River Species Water Depletion	Blowout Penstemon	Colorado Butterfly Plant (CBP)	CBP Critical Habitat	Ute Ladies'-Tresses
Acquire conservation easements	NL-b	NJ	NL-b	NL-b	NL-b	NL-b	NI	NL-b	NI	NE	NE	NL-b	NL-b	NL-b	NL-b
Disposal or transfer of public lands through Desert Land Entry, public sale, exchange, Wyoming indemnity selection, or Recreation and Public Purposes (RPP), leases or patents	NL-d	NJ	NL-d	NL-d	NL-d	NL-d	MI	NL-d	MI	LAA	LAA	NL-d	NL-d	NL-d	NL-d
ROW/LEASE: utility transportation corridors	NL-d	NJ	LAA	LAA	NL-d	LAA	NI	NL-i	NI	NE	NE	NL-i	NL-d	NL-i	NL-i
ROW: powerlines	NL-d	NJ	NE	NE	NL-d	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
LEASE: communication sites	NL-d	NJ	NL-d	NL-d	NL-d	NL-i	NI	NL-i	NI	LAA	LAA	NL-d	NL-i	NL-i	NL-i
ROW: pipelines	NL-d	NJ	NL-d	NL-d	NL-d	NL-i	NI	NL-d	NI	LAA	LAA	NL-d	NL-i	NL-i	NL-i
ROW: ditches and canals	NL-d	NJ	NL-d	NL-d	NL-d	NL-i	NI	NL-d	NI	LAA	LAA	NE	NE	NE	NL-d
ROW: roads	NL-d	NJ	LAA	LAA	NL-d	LAA	NI	NL-d	MI	LAA	LAA	NL-d	NL-d	NL-d	NL-d
ROW: well pad	NL-d	NJ	NL-d	NL-d	NL-d	NL-d	NI	NL-i	NI	LAA	LAA	NL-d	NL-i	NL-i	NL-i
ROW: reservoirs	NL-d	NJ	LAA	LAA	NL-d	NL-b	NI	NL-d	MI	LAA	LAA	NE	NL-d	NL-d	NL-d
ROW: buried telephone and fiber optic lines	NL-d	NJ	NL-d	NL-d	NL-i	NL-i	NI	NL-i	NI	NE	NE	NL-d	NL-i	NL-i	NL-i
ROW: wind power generation farms and facilities	NL-d	NJ	NL-d	NL-d	NL-i	LAA	NI	NL-i	NI	NE	NE	NE	NL-i	NL-i	NL-i
ROW: Compressor stations and other facilities	NL-d	NJ	NL-d	NL-d	NL-i	NL-d	NI	NL-i	NI	NE	NE	NE	NL-i	NL-i	NL-i
Temporary use permits (i.e., staging areas, storage, permit of existing roads)	NL-d	NJ	NL-d	NL-d	NL-d	LAA	NI	NL-d	NI	LAA	LAA	NL-d	NL-d	NL-d	NL-d
Road closures / rehabilitation	NL-b	NJ	NL-b	NL-b	NL-b	NL-b	NI	NL-b	NI	NE	NE	NL-b	NL-b	NL-b	NL-b
Designate, cancel or change stock trail driveways	NL-i	NJ	NL-i	NL-i	NL-i	NE	NI	NL-i	NI	NE	NE	NL-i	NL-i	NL-i	NL-i
Livestock Management															
Livestock conversions	NL-i	NJ	NL-i	NL-d	NE	NL-d	NI	NL-i	NI	NE	NE	LAA	LAA	LAA	LAA

Biological Assessment on the Affects of Bureau of Land Management actions within the Rawlins Field Office on Species listed under the Endangered Species Act	Black-footed Ferret (general population)	Black-footed Ferret (Shirley Basin Unit)	Preble's Meadow Jumping Mouse (PMJ)	PMJ Critical Habitat	Canada Lynx	Bald Eagle	Western Yellow-billed Cuckoo	Wyoming Toad	Western Boreal Toad	Platte River Species Water Depletion	Colorado River Species Water Depletion	Blowout Penstemon	Colorado Butterfly Plant (GBP)	GBP Critical Habitat	Ute Ladies'-Tresses
Livestock grazing authorization (Adjust season of use, distribution, class, and numbers of livestock)	NL-i	NJ	NL-d	NL-d	NE	NL-d	NI	NL-d	NI	NE	NE	LAA	LAA	LAA	LAA
Construct exlosures	NL-i	NJ	NL-d	NL-i	NE	NL-i	NI	NL-d	NI	NE	NE	NL-d	NL-d	NL-i	NL-d
Design and implement grazing systems	NL-i	NJ	NL-d	NL-d	NE	NL-i	NI	NL-d	NI	NE	NE	LAA	LAA	LAA	LAA
Construct, maintain and modify fences	NL-i	NJ	NL-d	NL-d	NE	NL-i	NI	NL-d	NI	NE	NE	NL-i	NL-i	NL-i	NL-i
Develop water facilities (catchments, reservoirs, springs, pipelines, and wells)	NL-d	NJ	LAA	LAA	NL-b	NL-i	MI	NL-d	MI	LAA	LAA	NL-i	NL-d	NL-d	NL-d
Supplemental feeding authorization	NL-i	NJ	NE	NE	NE	NL-i	NI	NL-i	NI	NE	NE	NE	NE	NE	NE
Minerals															
Apply dust control measures	NE	NJ	NL-i	NL-i	NE	NE	NI	NE	NI	LAA	LAA	NL-i	NL-d	NL-d	NL-d
Restrict flaring of natural gas	NE	NJ	NE	NE	NE	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Control/limit emissions	NE	NJ	NE	NE	NL-i	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Construction and reclamation of well pads, access roads, and reserve pits	NL-d	NJ	NL-d	NL-d	NL-i	NL-i	NI	NL-i	NI	LAA	LAA	NE	NL-d	NL-d	NL-d
Reservoirs associated with water disposal	NL-d	NJ	NL-d	NL-d	NL-b	NE	NI	NL-b	NI	NE	NE	NE	NL-d	NL-d	NL-d
Compressor stations, product enhancement and disposal facilities	NL-d	NJ	NL-d	NL-d	NL-d	NL-d	NI	NL-i	NI	NE	NE	NE	NL-d	NL-d	NL-d
Pipelines associated with leases or units	NL-i	NJ	NL-i	NL-i	NL-d	NE	NI	NE	NI	LAA	LAA	NL-d	NL-d	NL-d	NL-d
Power lines associated with leases or units	NL-i	NJ	NL-i	NL-i	NL-d	LAA	NI	NE	NI	NE	NE	NE	NL-d	NL-d	NL-d
Wind power associated with leases or units	NL-i	NJ	NE	NE	NL-d	LAA	NI	NE	NI	NE	NE	NE	NE	NE	NE

Biological Assessment on the Affects of Bureau of Land Management actions within the Rawlins Field Office on Species listed under the Endangered Species Act	Black-footed Ferret (general population)	Black-footed Ferret (Shirley Basin Unit)	Preble's Meadow Jumping Mouse (PMJ)	Habitat	Canada Lynx	Bald Eagle	Western Yellow-billed Cuckoo	Wyoming Toad	Western Boreal Toad	Platte River Species Water Depletion	Colorado River Species Water Depletion	Penstemon	Colorado Butterfly Plant (GBP)	GBP Critical Habitat	Ute Ladies'-Tresses
Coal development	NE	NJ	NE	NE	NE	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Locatable mineral exploration and development (e.g., gold, silver, cobalt, etc.)	NL-i	NJ	NL-d	NL-d	NL-i	NL-i	NI	NE	NI	NE	NE	NE	NL-d	NL-d	NL-d
Mineral material sales (sand and gravel, decorative stone, aggregate)	NE	NJ	NL-i	NL-i	NE	NL-i	NI	NE	NI	LAA	LAA	NE	NL-d	NL-d	NL-d
Geophysical exploration	NL-i	NJ	NL-i	NL-i	NE	NL-i	NI	NE	NI	NE	NE	NL-i	NL-d	NL-d	NL-d
Off Highway Vehicle Use															
Designate and implement closed area for OHV use	NL-d	NJ	NL-d	NL-d	NL-d	NL-i	NI	NL-d	NI	NE	NE	NL-d	NL-d	NL-d	NL-d
Designate and implement limited areas for OHV use	NL-d	NJ	NL-d	NL-d	NL-d	NL-i	NI	NL-d	NI	NE	NE	NL-d	NL-d	NL-d	NL-d
Designate and implement open areas for OHV use	NL-d	NJ	NE	NE	NE	NE	NI	NE	NI	NE	NE	NL-d	NE	NE	NE
Post signs	NE	NJ	NE	NE	NE	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Allow use of motorized over-the-snow vehicles	NL-d	NJ	NE	NE	NL-d	NL-i	NI	NE	NI	NE	NE	NE	NL-d	NL-d	NL-d
Paleontology															
Surface disturbing activities to collect specimens (e.g., hand tools, power tools, heavy machinery)	NE	NJ	NL-i	NL-i	NL-i	NL-i	NI	NE	NI	NE	NE	NE	NE	NE	NE
Allow collection of invertebrate fossils	NE	NJ	NL-i	NL-i	NL-i	NL-i	NI	NE	NI	NE	NE	NE	NE	NE	NE
Inventory paleontological resources	NE	NJ	NL-i	NL-i	NL-i	NL-i	NI	NE	NI	NE	NE	NE	NE	NE	NE
Develop interpretive sites	NE	NJ	NE	NE	NE	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Stabilize erosion (e.g., bury exposed site)	NE	NJ	NL-i	NL-i	NL-i	NL-i	NI	NE	NI	NE	NE	NE	NE	NE	NE
Recreation Resources															
Restrict recreational use	NL-b	NJ	NL-b	NL-b	NL-b	NL-b	NI	NL-b	NI	NE	NE	NL-b	NL-b	NL-b	NL-b

Biological Assessment on the Affects of Bureau of Land Management actions within the Rawlins Field Office on Species listed under the Endangered Species Act	Black-footed Ferret (general population)	Black-footed Ferret (Shirley Basin Unit)	Preble's Meadow Jumping Mouse (PMJ)	PMJ Critical Habitat	Canada Lynx	Bald Eagle	Western Yellow-billed Cuckoo	Wyoming Toad	Western Boreal Toad	Platte River Species Water Depletion	Colorado River Species Water Depletion	Blowout Penstemon	Colorado Butterfly Plant (GBP)	GBP Critical Habitat	Ute Ladies'-Tresses
Permit competitive recreation events	NL-d	NJ	NE	NE	NE	NE	NI	NE	NI	NE	NE	NL-d	NE	NE	NE
Develop recreational trails	NE	NJ	NE	NE	NE	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Construct recreation sites	NE	NJ	NE	NE	NE	NL-d	NI	NE	NI	NE	NE	NE	NE	NE	NE
Maintain developed and undeveloped recreation sites	NE	NJ	NE	NE	NE	NL-d	NI	NE	NI	NE	NE	NE	NE	NE	NE
Place boundary signs and interpretive markers	NE	NJ	NE	NE	NE	NE	NI	NE	NI	NE	NE	NL-i	NE	NE	NE
Commercial recreation uses	NL-d	NJ	NL-d	NL-d	NL-i	NL-d	NI	NL-d	NI	NE	NE	NE	NL-d	NL-d	NL-d
Develop public water sources for recreation facilities	NL-i	NJ	NE	NE	NE	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
SMA															
Adobe Town WSA – continue present management	NL-b	NJ	NE	NE	NL-b	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Prospect Mountain WSA	NE	NJ	NE	NE	NL-b	NL-b	NI	NE	NI	NE	NE	NE	NE	NE	NL-b
Encampment River Canyon WSA – continue present management	NE	NJ	NE	NE	NL-b	NL-b	NI	NE	NI	NE	NE	NE	NE	NE	NL-b
Ferris Mountain WSA – continue present management	NE	NJ	NE	NE	NL-b	NL-b	NI	NE	NI	NE	NE	NE	NE	NE	NL-b
Bennett Mountains WSA – continue present management	NE	NJ	NE	NE	NL-b	NL-b	NI	NE	NI	NE	NE	NE	NE	NE	NL-b
Sandhills ACEC/proposed JO Ranch expansion	NL-b	NJ	NE	NE	NL-b	NL-b	NI	NE	NI	NE	NE	NE	NE	NE	NL-b
Jep Canyon Wildlife Habitat Management Area	NL-b	NJ	NE	NE	NL-b	NE	NI	NE	NI	NE	NE	NE	NE	NE	NL-b
Shamrock hills Wildlife Habitat Management Area	NL-b	NJ	NE	NE	NE	NE	NI	NE	NI	NE	NE	NE	NE	NE	NL-b
Laramie Plains Lakes Wildlife Habitat Management Area	NE	NJ	NE	NE	NE	NE	NI	NL-b	NI	NE	NE	NE	NL-b	NL-b	NL-b
Blowout Penstemon ACEC	NE	NJ	NE	NE	NE	NE	NI	NE	NI	NE	NE	NL-b	NE	NE	NL-b
North Platte River SRMA	NE	NJ	NE	NE	NE	NL-b	NI	NE	NI	NE	NE	NE	NE	NE	NL-b

Biological Assessment on the Affects of Bureau of Land Management actions within the Rawlins Field Office on Species listed under the Endangered Species Act	Black-footed population)	otted erret (Shirley Basin Unit)	Preble's Meadow Jumping Mouse (PMJ)	PMJ Critical Habitat	Canada Lynx	Bald Eagle	Western Yellow-billed Cuckoo	Wyoming Toad	Western Boreal Toad	Platte River Species Water Depletion	Colorado River Species Water Depletion	Blowout Penstemon	Colorado Butterfly Plant (GBP)	GBP Critical Habitat	Ute Ladies'-Tresses
	NL-d	NJ	NL-d	NL-d	NL-i	NL-i	NI	NL-d	NI	NE	NE	NL-d	NL-d	NL-d	NL-d
Transportation and Access Management															
Acquire access easements	NL-d	NJ	NL-d	NL-d	NL-i	NL-i	NI	NL-d	NI	NE	NE	NL-d	NL-d	NL-d	NL-d
Vegetation (including weed control)															
Implement planting and seeding	NL-i	NJ	NL-b	NL-b	NL-i	NL-b	NI	NE	NI	NE	NE	NL-i	NL-d	NL-d	NL-d
Use biological controls including species-specific insects and livestock grazing	NL-i	NJ	NL-d	NL-d	NE	NL-i	NI	NL-d	NI	NE	NE	NL-i	NL-i	NL-i	NL-i
Use light mechanical control, including cutting and thinning with hand tools	NL-i	NJ	NE	NE	NL-i	NL-i	NI	NL-i	MI	NE	NE	NE	NL-d	NL-d	NL-d
Use heavy mechanical control, including brush beating, cutting, and thinning with machinery	NL-d	NJ	NE	NE	NL-i	NL-i	NI	NL-d	NI	NE	NE	NE	NE	NE	NE
Use chemical control (including aerial spraying)	NL-i	NJ	NE	NE	NL-i	NL-i	NI	NE	NI	NE	NE	NE	NE	NE	NE
VRM															
Require facilities to blend with the natural environment	NE	NJ	NE	NE	NE	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Water Quality, Watershed and Soils Management															
Allow for surface discharge of produced water	NE	NJ	NL-i	NL-i	NE	NL-i	NI	NE	NI	NE	NE	NE	NL-i	NL-i	NL-i
Restrict surface disturbance near water resources and sensitive soils	NE	NJ	NL-b	NL-b	NL-b	NL-b	NI	NL-b	NI	NE	NE	NE	NL-b	NL-b	NL-b
Limit surface disturbance and prohibit new permanent structures in the Encampment River watershed	NE	NJ	NE	NE	NL-b	NL-b	NI	NE	NI	NE	NE	NE	NE	NE	NL-b
Close areas, including roads, where accelerated erosion is occurring	NL-b	NJ	NL-b	NL-b	NL-b	NL-b	NI	NL-b	NI	NE	NE	NL-b	NL-b	NL-b	NL-b

Biological Assessment on the Affects of Bureau of Land Management actions within the Rawlins Field Office on Species listed under the Endangered Species Act	Black-footed Ferret (general population)	Black-footed Ferret (Shirley Basin Unit)	Prairie's Meadow Jumping Mouse (PMJ)	PMJ Critical Habitat	Canada Lynx	Bald Eagle	Western Yellow-billed Cuckoo	Wyoming Toad	Western Boreal Toad	Platte River Species Water Depletion	Colorado River Species Water Depletion	Blowout Penstemon	Colorado Butterfly Plant (GBP)	GBP Critical Habitat	Ute Ladies'-Tresses
Install stream crossings for appropriate sediment and flow passage (culverts, bridges)	NE	NJ	NL-d	NL-d	NL-i	NL-b	NI	NL-i	NI	NE	NE	NE	NL-d	NL-d	NL-d
Develop riparian/wetland exclosures	NE	NJ	NL-d	NL-i	NE	NL-i	NI	NL-d	NI	NE	NE	NE	NL-d	NL-i	NL-d
Channel restoration using heavy equipment	NE	NJ	LAA	LAA	NL-i	NL-b	MI	NL-d	MI	LAA	LAA	NE	NL-d	NL-d	NL-d
Cutting, planting, and seeding to restore function in riparian/wetland areas	NE	NJ	NL-b	NL-b	NL-i	NL-b	NI	NE	NI	NE	NE	NE	NL-d	NL-d	NL-d
Wildlife and Fish															
Predator control (cooperation with the APHIS)	LAA	NJ	NE	NE	NL-d	LAA	NI	NE	NI	NE	NE	NE	NE	NE	NE
Construction of artificial structures for raptors	NL-d	NJ	NE	NE	NE	NL-b	NI	NE	NI	NE	NE	NE	NE	NE	NE
Guzzler development	NL-i	NJ	NE	NE	NE	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Modify fences	NL-i	NJ	NL-i	NL-i	NE	NL-i	NI	NE	NI	NE	NE	NL-d	NL-d	NL-i	NL-d
Develop islands	NE	NJ	NE	NE	NE	NL-i	NI	NE	NI	NE	NE	NE	NE	NE	NE
Road closure (permanent/seasonal)	NL-b	NJ	NL-b	NL-b	NL-b	NE	NI	NL-b	NI	NE	NE	NL-b	NL-b	NL-b	NL-b
Construct exclosures	NL-i	NJ	NL-d	NL-i	NE	NL-i	NI	NL-d	NI	NE	NE	NL-d	NL-d	NL-i	NL-d
Construct reservoirs and pits	NL-i	NJ	NL-d	NE	NL-b	NL-i	NI	NL-d	NI	LAA	LAA	NE	NL-d	NL-d	NL-d
Chemically remove non-native fish species	NE	NJ	NL-i	NL-i	NE	NL-i	NI	NE	NI	NE	NE	NE	NE	NE	NE
Remove or replace barriers to fish passage (e.g., culverts, in-stream structures)	NE	NJ	NL-d	NL-b	NE	NL-i	NI	NE	MI	NE	NE	NE	NE	NE	NE
Wild Horse Management															
Construction of short-term temporary facilities (e.g., traps and holding facilities)	NE	NJ	NE	NE	NE	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE
Construction of long-term	NL-i	NJ	NE	NE	NE	NE	NI	NE	NI	NE	NE	NE	NE	NE	NE

Biological Assessment on the Affects of Bureau of Land Management actions within the Rawlins Field Office on Species listed under the Endangered Species Act	Black-footed Ferret (general population)	Black-footed Ferret (Shirley Basin Unit)	Preble's Meadow Jumping Mouse (PMJ)	PMJ Critical Habitat	Canada Lynx	Bald Eagle	Western Yellow-billed Cuckoo	Wyoming Toad	Western Boreal Toad	Platte River Species Water Depletion	Colorado River Species Water Depletion	Blowout Penstemon	Colorado Butterfly Plant (CBP)	CBP Critical Habitat	Ute Ladies'-Tresses
permanent facilities (e.g. boundary fences and water development)															
Gatherings using helicopters and riders	NE	NJ	NE	NE	NE	NL-i	NI	NE	NI	NE	NE	NE	NE	NE	NE

Threatened, Endangered, and Proposed Species

NE = No Effect LAA = May Affect, Likely to Adversely Affect NJ = No Jeopardy JP = Jeopardy

NLAA = Not Likely to Adversely Affect (NL-) the following acronyms apply:

- NL-b = due to beneficial effects
- NL-d = due to discountable effect
- NL-i = Insignificant effects

Candidate Species

- NI = No Impact
- MI = May Impact, but not likely to contribute to the need for federal listing

Analysis of Management Actions and Effects Determinations

Manpower and budgetary restrictions, and changes in biological and technological information, may affect the extent to which RFO may engage in the following program activities. Therefore, the likelihood of these potentially authorized activities to occur is largely undeterminable at this scale over the life of the plan. Site-specific analysis and determinations and section 7 consultations, where appropriate, will be conducted on a case-by-case basis throughout the life of the plan.

The BLM programs within the RMPPA occur in a diversity of habitat types that occur throughout the RMPPA and site-specific projects are analyzed at the project level to determine if habitat exists for all T&E and Special Status species identified within the RFO. If habitat is not present for a particular T&E and Special Status species, then a No Effect determination is made at that level. In addition, analysis completed at the site specific project level include determinations of insignificant, discountable, and beneficial affects for each T&E and Special Status species that may occur or have the potential to occur, or have habitat present within the project area.

A T&E analysis worksheet (Determination of Need for T&E Conference/Consultation and Biological Evaluation on Other Wildlife Species) is completed for every surface disturbing or disruptive activity that may occur on BLM administered public lands; these forms are modified periodically to comply with changes in the ESA. These forms are kept on file at the BLM field office in Rawlins, WY and those forms associated with projects that require conferencing and/or consultation are forwarded to the USFWS in Cheyenne, WY.

General Effects Determinations for Each Species and Each BLM-Administered Program

Black-Footed Ferret

Threats from Human Activity

Past animal damage control programs probably have had the greatest impact on ferret mortality. From the 1920s until the mid-1970s, predator control through trapping and poisoning resulted in significant black-footed ferret mortality (67 percent of positive ferret reports). Secondary poisoning of ferrets is also known to have occurred from rodenticides used in prairie dog eradication programs. Widespread poisoning of prairie dogs and conversion of their habitat to agricultural cultivation, drastically reduced prairie dog abundance and distribution in the last century. This severe decline of prairie dogs resulted in a concomitant and near-fatal decline in ferrets.

Varmint hunters seek out prairie dog colonies for target shooting. Because few people can distinguish between a ferret, a burrowing owl, or a prairie dog peering over a prairie dog mound, it is assumed that target shooters have killed some black-footed ferrets accidentally.

Land use activities such as rights-of-ways, energy developments, use permits, urban expansion, mineral extraction, and range improvement projects can reduce or fragment ferret habitat and therefore require inventory and clearances. Habitat losses have been minimized through coordination and management prescriptions requiring surveys and avoidance of potential black-footed ferret habitat.

Effects of the Proposed Rawlins Field Office RMP

Black-footed ferrets have the potential to exist within the RMPPA at locations other than the Shirley Mountain experimental unit. Black-footed ferrets are known to be very closely associated with prairie

dogs, and their long-term welfare is dependent on healthy prairie dog populations and colony complexes. The restrictions applied to prairie dog colonies will provide a significant measure of protection to black-footed ferrets.

These protections include stipulations on surface occupancy within and near prairie dog colonies, seasonal restrictions, range improvement restrictions and others.

Determination: Under the Rawlins Field Office Resource Management Plan it is determined that the following impacts have been determined for black-footed ferret:

- Wildlife and Fish—LAA
- Air Quality, Cultural, Fire and Fuels Management, Forestry, Lands and Realty, Livestock Management, Minerals, OHV Use, Recreation Resources, Vegetation, Wild Horse Management, Special Management Areas, Transportation and Access Management, and Water Quality, Watershed, and Soils Management —NL-i
- Paleontology and Visual —NE

For a further clarification on these determinations refer to the “Analysis of Management Actions and Effects Determinations” section.

Shirley Basin Habitat

The Shirley Basin ‘Nonessential Experimental Population’ was established under the “Cooperative Management Plan for Black-footed Ferrets – Shirley Basin/Medicine Bow, Wyoming” August 21, 1991.

Preble’s Meadow Jumping Mouse

Threats from Human Activity

Loss of habitat, especially riparian, is the major impact to this species. Urban and suburban developments in and adjacent to riparian areas are the primary threats (Pague and Grunau 2000). Such development directly eliminates habitat. It can also reduce the quality of remaining habitat by increasing disturbance, reducing water quality, channelizing streams, and increasing densities of exotic predators such as Norway rats, domestic dogs and cats. Densities of human-commensal predators (e.g., skunk, raccoon, red fox) may also increase in response to local elimination of larger carnivores (e.g., mountain lion, coyote, black bear).

Over grazing of stream banks also reduces habitat quality (Brown 1967, Clark and Stromberg 1987, Compton and Hugie 1993), as does conversion of wetlands to croplands. The effects of noxious and invasive weeds on *Zapus* have not been studied, but if such weeds replace important seed producers they could reduce forage quantity. Pesticides may directly contaminate mice and could also reduce their insect prey base.

Effects of the Proposed Rawlins Field Office RMP

Mitigation actions and conservation measures are discussed in the “Analysis of Management Actions and Effects Determinations” section of this BA.

Determination: Under the Rawlins Field Office Resource Management Plan it is determined that the following impacts have been determined for Preble’s jumping meadow mouse:

- Fire and Fuels Management, Lands and Realty, Livestock Management, and Water Quality, Watershed, and Soils Management —LAA
- Cultural, Forestry, Minerals, and Paleontology —NL-i
- OHV Use, Recreation Resources, Vegetation, Wildlife and Fish, and Transportation and Access Management —NL-d
- Air Quality, Visual, Wild Horse Management, and Special Management Areas —NE

For a further clarification on these determinations refer to the “Analysis of Management Actions and Effects Determinations” section.

Preble’s Meadow Jumping Mouse Critical Habitat

Determination: Under the Rawlins Field Office Resource Management Plan it is determined that the following impacts have been determined for Preble’s meadow jumping mouse critical habitat:

- Fire and Fuels Management, Lands and Realty, and Livestock Management —LAA
- Cultural, Forestry, Minerals, Paleontology, Wildlife and Fish, and Water Quality, Watershed, and Soils Management —NL-i
- OHV Use, Recreation Resources, Vegetation, and Transportation and Access Management —NL-d
- Air Quality, Visual, Wild Horse Management, and Special Management Areas—NE

For a further clarification on these determinations refer to the “Analysis of Management Actions and Effects Determinations” section.

Canada lynx

Threats from Human Activity

The Canada Lynx BA cites the following risk factors (Ruediger et al. 2000) for the Northern Rockies geographic area:

- Timber Management – harvest and precommercial thinning that reduce denning or foraging habitat or converts habitat to less desirable tree species;
- Wildland Fire Management – where exclusion changes the vegetation mosaic maintained by natural disturbance processes;
- Livestock Management – where forage for lynx prey is reduced;
- Recreation – where roads and winter recreation trails facilitate access to historical lynx habitat by competitors;
- Incidental trapping and shooting;
- Predation;
- Highways – vehicle strikes or obstructions to lynx movements; and
- Development of private lands.

Factors affecting lynx habitat include human alteration of the distribution and abundance, species composition, successional stages, and connectivity of forests, and the resulting changes in the forest’s capacity to sustain lynx populations. People change forests through timber harvest, fire suppression and conversion of forestlands to agriculture. Forest fragmentation may eventually become severe enough to isolate habitat into small patches, thereby reducing the viability of wildlife that are dependent on larger areas of forest habitat (Levities and Harrison 1989). In all regions of the lynx range in the contiguous United States, timber harvest and its related activities are a predominant land use affecting lynx habitat. Timber harvest and associated forest management can be benign, beneficial, or detrimental to lynx

depending on harvest methods, spatial and temporal specifications, and the inherent vegetation potential of the site.

One of the primary reasons for the listing of the lynx was based on the conclusion that the low numbers in the contiguous United States were the residual effect of over-trapping that was believed to have occurred in the 1970s and 1980s; this was in response to unprecedented high pelt prices. Human-induced mortality was generally believed to be the most significant source of lynx mortality (Ward and Krebs 1985). Trapping mortality was considered to be entirely additive (i.e., in addition to natural mortality) rather than compensatory (taking the place of natural mortality) (Brand and Keith 1979). However, Canadian researchers determined that natural mortality during the declining phase of the lynx cycle is high; therefore, trapping mortality during some portions of the cyclic decline may compensate for natural mortality (Poole 1994; Slough and Mowat 1996). Thus, trapping of lynx can be both additive and compensatory, depending on when it occurs in the cycle.

Lynx movements may be negatively influenced by high traffic volume on roads that bisect suitable lynx habitat. Given the distances and locations where known lynx within the southern boreal forest have moved, lynx successfully cross many types of roads, including unpaved forest roads, secondary paved roads, as well as Interstate highways (Mech 1980; Smith 1984; Brainerd 1985; Squires and Laurion 2000). Highways with high volumes of traffic and associated suburban developments inhibit lynx home range movement and dispersal, and may contribute to loss of habitat connectivity. However, no information currently exists to determine the level at which traffic volume or roadway design may influence lynx movements or create an impediment to movement. Roads do not appear to be a significant direct cause of lynx mortality (Staples 1995; Ruggiero et al. 2000).

Disease and predation are not known to be factors threatening lynx.

Evidence indicates that lynx tolerate some level of human disturbance (Staples 1995; Aubry et al. 1999; Mowat et al. 2000). For most areas of the contiguous United States, there is no evidence that human-caused factors have significantly reduced the ability of lynx to disperse or have resulted in the loss of genetic interchange. Likewise, no evidence exists that human presence displaces lynx. Lynx have been documented using some types of roads for hunting and travel (Parker 1981; Koehler and Brittell 1990; Koehler and Aubry 1994). No information is available demonstrating that forest roads negatively impact resident lynx populations.

Lynx are taken during legal trapping and hunting for other species, such as wolverine and bobcat (McKay 1991; Staples 1995). While lynx were likely captured incidentally in the past during regulated and unregulated trapping for other predators, the lynx have persisted throughout much of their historic range.

Coyote, bobcat, and mountain lion are hypothesized to be potential lynx competitors (Brocke 1982; McCord and Cardoza 1982; Parker et al. 1983; Quinn and Parker 1987; Aubry et al. 2000; Buskirk et al. 2000; Ruggiero et al. 2000). In Wyoming, the ranges of these species all overlap. Lynx are highly evolved for hunting in deep snow: they have a morphological advantage because they are able to walk on snow rather than sink into it as do these other species with higher foot loads (Murray and Boutin 1991; Buskirk et al. 2000). Traditionally, where these species' ranges overlap with that of lynx, snow conditions exclude them from the winter habitats occupied by lynx (McCord and Cardoza 1982; Parker et al. 1983; Buskirk et al. 2000). However, snow trails packed by humans (i.e., by snowmobiles, cross-country skiing) or snowplowing have facilitated the movement of potential lynx competitors into the deep snow habitats of the lynx (USFS and BLM 1999). Yet, there is a lack of evidence that competition with coyotes, mountain lions or bobcats is negatively affecting lynx at a population-level scale. Direct lynx mortality from mountain lions is reported by Squires and Laurion (2000). Other potential predators

include the gray wolf (*Canis lupus*) and wolverine (*Gulo gulo*) (Poole 1994; Slough and Mowat 1996; O'Donoghue et al. 1997; Apps 2000; Squires and Laurion 2000).

The USFWS concluded in the Federal Register Canada lynx listing document that the single factor threatening the contiguous United States, Distinct Population Segments (DPS) of lynx is the inadequacy of existing regulatory mechanisms, specifically the lack of guidance for conservation of lynx in National Forest Land and Resource Plans and BLM Land Use Plans. Until Plans adequately address risks such as those identified in the LCAS (Ruediger et al. 2000), there is a significant threat to the contiguous DPS of lynx.

Effects of the Proposed Rawlins Field Office RMP

Since the lynx does not have a significant population within the Rawlins field office and is noted as using the riparian zones only as a migration corridor or traverse route from one forested area to another, there are no significant effects on the lynx from BLM management actions within the field office.

Determination: Under the Rawlins Field Office Resource Management Plan it is determined that the following impacts have been determined for Canada lynx:

- Cultural, Fire and Fuels Management, Lands and Realty, Minerals, Paleontology, Recreation Resources, Vegetation, Transportation and Access Management, and Water Quality, Watershed, and Soils Management —NL-i
- Forestry, OHV Use, and Wildlife and Fish —NL-d
- Livestock Management and Special Management Areas —NL-b
- Air Quality, Visual, and Wild Horse Management —NE

For a further clarification on these determinations refer to the “Analysis of Management Actions and Effects Determinations” section.

Bald Eagle

Threats from Human Activity

The accelerated decline in numbers of the species since World War II has been attributed to several factors. Some of the factors contributing to the decline of the bald eagle are: unauthorized poison baits on public lands, shooting, electrocution, and chemicals in the environment.

Effects of the Proposed Rawlins Field Office RMP

Implementation of the Rawlins Field Office RMP would not change any potential effects on the bald eagle that may result from current non-federal actions.

The RMPPA includes descriptions of each management prescription applied within the FO. The following text briefly summarizes the activities and any specific mitigation measures associated with each management prescription. The Wyoming BLM Mitigation Guidelines for Surface Disturbing and Disruptive Activities will be applied to all surface disturbing or disruptive activities. As described previously, these guidelines include timing limitations and restrictions on surface occupancy that will minimize potential effects to bald eagles and their habitats. Refer to the Bald Eagle Biological Assessment for a complete explanation of each prescription.

Determination: Under the Rawlins Field Office Resource Management Plan it is determined that the following impacts have been determined for bald eagle:

- Forestry, Lands and Realty, Minerals, and Wildlife and Fish —LAA
- Cultural, Fire and Fuels Management, Livestock Management, Paleontology, Vegetation, Wild Horse Management, Special Management Areas, and Water Quality, Watershed, and Soils Management —NL-i
- Recreation Resources, OHV Use, and Transportation and Access Management —NL-d
- Air Quality and Visual—NE

For a further clarification on these determinations refer to the “Analysis of Management Actions and Effects Determinations” section.

Western Yellow-billed Cuckoo

Threats from Human Activity

Loss of habitat is probably the greatest threat facing the cuckoo. Dams and river flow management, overgrazing, land conversions associated with agriculture, and infestations of exotic plants have severely impacted riparian habitat throughout the West, including Wyoming (Laymon 1987; Hughes 1999; UDSI FWS 2000, 2001).

Effects of the Proposed Rawlins Field Office RMP

Possible adverse effects to the western population of the yellow-billed cuckoo (cuckoo) could occur from activities such as grazing, water depletions and/or diversions associated with oil and gas or livestock water development, and noxious and invasive weed invasion from grazing and surface disturbing activity. Grazing and surface disturbing activities could result in soil compaction and loss of vegetative cover and therefore reduced infiltration and increased runoff and sedimentation of surface waters. Promotion of invasive plant species would also occur with grazing and surface disturbing activities. Other potential, adverse impacts from livestock management activities could include channel destabilization and nutrient loading of surface waters. Water depletions and diversions would also occur in potential habitat, however because potential habitat for the cuckoo in the planning area is within the Little Snake River drainage, depletions and diversions would be minimal and therefore would not significantly adversely affect the cuckoo (see the following section for an in-depth discussion on depletions).

Determination: Under the Rawlins Field Office Resource Management Plan it is determined that the following impacts have been determined for western yellow-billed cuckoo:

- Lands and Realty, Livestock Management, and Water Quality, Watershed, and Soils Management —MI
- Air Quality, Cultural, Fire and Fuels Management, Forestry, Minerals, OHV Use, Paleontology, Recreation Resources, Vegetation, Visual, Wildlife and Fish, Wild Horse Management, Special Management Areas, and Transportation and Access Management—NI

For a further clarification on these determinations refer to the “Analysis of Management Actions and Effects Determinations” section.

Wyoming Toad

Threats from Human Activity

Loss of habitat is probably the greatest threat facing the Wyoming Toad. Dams and river flow management, overgrazing, land conversions associated with agriculture, and infestations of exotic plants

have severely impacted riparian habitat throughout the West, including Wyoming (Laymon 1987; Hughes 1999; UDSI FWS 2000, 2001).

Effects of the Proposed Rawlins Field Office RMP

Mitigation actions and conservation measures are discussed in the “Analysis of Management Actions and Effects Determinations” section of this BA.

Determination: Under the Rawlins Field Office Resource Management Plan it is determined that the following impacts have been determined for Wyoming toad:

- Cultural, Fire and Fuels Management, Lands and Realty, Livestock Management, Minerals, Vegetation, Wildlife and Fish, Transportation and Access Management, and Water Quality, Watershed, and Soils Management —NL-i
- OHV Use and Recreation Resources —NL-d
- Special Management Areas—NL-b
- Air Quality, Forestry, Paleontology, Visual, and Wild Horse Management —NE

For a further clarification on these determinations refer to the “Analysis of Management Actions and Effects Determinations” section.

Western Boreal Toad

Threats from Human Activity

Activities on BLM lands which include, but are not limited to, recreation (hiking, camping, wildlife viewing, and fishing), livestock management, mineral development, timber and vegetation management, and wildfire suppression may lead to habitat alterations for the toad. Although declines in toad numbers have not been directly linked to habitat alteration, activities that destroy, modify, or curtail habitat likely contribute to the continued decline in toad numbers.

Recreational activities such as hiking, camping, wildlife viewing, non-motorized boating, and fishing may occasionally disrupt breeding pairs or trample recently metamorphosed juveniles along shorelines (Campbell 1970). No evidence suggests that these activities have been major factors in the overall decline of boreal toads in the southern Rocky Mountains.

Timber management activities such as sales may alter or cause the destruction of boreal toad habitat. Marshes, wet meadows and intermittent wetlands can be altered by timber sales or other management activities and allow increased evaporation, altered seepage flow (through reduced snow pack on exposed cut areas or road bed diversion of waters) and physical destruction of wetland vegetation.

Livestock management activities may also impact adults, particularly when they are present in concentrations at breeding sites due to trampling. Eggs, larvae and juveniles may also be vulnerable to livestock trampling.

Water development projects may destroy boreal toad breeding habitat and summer foraging areas. The long-term effects of elevated water levels and dispersal of toads into different habitats is not known. The overall impact of water retention projects on the southern Rocky Mountain population of the boreal toad is not thought to be significant. Although construction of new reservoirs may impact localized breeding sites or localities, range-wide declines cannot be attributed to reservoir construction.

Activities on BLM managed lands have the potential to spread disease among amphibian populations. Recent information points strongly towards chytrid fungus as the cause for boreal toad decline in the 1970's and presently. This fungus (*Batrachochytrium dendrobatidis*) appears to have impacted at least 50 percent of the known range of the Rocky Mountain boreal toad. Chytrid fungus appears to have affected breeding localities in Wyoming southward into Colorado. Chytrid fungi attack the skin of toads and other amphibians but are not always lethal. An international chytrid fungus working group has been formed to address the fungus problem since declines have been noted in Central America and Australia as well as the United States. Members of the international working group and the Boreal Toad Recovery Team and Technical Advisory Group are working on determining the life history of the fungus and infection pathways. Specifically, work is proposed to determine if temperature, heavy metals, ultra-violet (UV-B) radiation, pH, and perhaps pesticides are impacting anti-microbial peptides on toads' skin which, if so, would allow the chytrid fungus to invade and cause death in boreal toads (C. Carey, pers. comm. 2000). A test is also being developed to detect the chytrid fungus on the toads and, hopefully, in the environment.

Internal parasites have been recorded from boreal toads in several locations. Nematodes, cestodes, and trematodes were found from toads in California (Koller and Gaudin 1977). In Colorado, trematodes were found in toads in Garfield County (Tiekotter and Mantor 1977). Protozoans, trematodes, and nematodes also were found in Utah boreal toads (Frandsen and Grundmann 1960) and Idaho boreal toads were infected with trematodes (Waitz 1961). However, none of these discoveries suggests that helminth parasites affected toad survival.

Numerous studies and discussions have been presented that implicate the introduction of bullfrogs (*Rana catesbeiana*) to regional declines in certain western amphibian species (Moyle 1973, Hammerson 1982, Hayes and Jennings 1986). Bullfrogs have not contributed to the decline of boreal toads, because they have not established populations in montane regions of the Rocky Mountains (Bury and Whelan 1984, Hammerson 1986).

The introduction of nonnative fish, and their subsequent predation on amphibian larvae, also has been widely reported to affect amphibian populations (Voris and Bacon 1966, Cochran 1983, Hayes and Jennings 1986, Bradford 1989). However, toad eggs and tadpoles reduce predation by producing chemical toxins that make them unpalatable (Licht 1968, Formanowicz and Brodie 1982, Hews 1988). In two studies, *Bufo sp.* eggs were unpalatable to two species of sunfish (*Lepomis spp.*), catfish (*Ictalurus melas*), stickleback (*Gasterosteus aculeatus*), and cutthroat trout (*Salmo clarkii*) (Licht 1968, 1969). A similar study found that larval forms of *Bufo sp.* were eaten less frequently by *Lepomis spp.* when offered with tadpoles of other genera (Voris and Bacon 1966). Declining toad numbers in trout-free waters suggests that *Salmo spp.* introductions in the montane regions of the southern Rocky Mountains are not responsible for declines in toad populations.

Several native predators tolerate boreal toad toxins and eat boreal toad eggs, tadpoles, recently metamorphosed juveniles, and adults (Olson 1989). Giant waterbugs (*Lethocerus americanus*), dragonfly naiads (*Aeshna umbrosa*) (Hews 1988), and gray jays (*Perisoreus canadensis*) (Beiswenger 1981) prey on toad larvae. Metamorphosed juveniles are susceptible to predation by garter snakes (*Thamnophis spp.*) (Arnold and Wassersug 1978) and spotted sandpipers (*Actitis macularia*) while ravens (*Corvus corax*) have been observed to prey on breeding adult toads (Olson 1989). Recent work by Livo (1999) investigated predacious diving beetle larvae (*Dytiscus sp.*), tiger salamander larvae (*Ambystoma tigrinum*), and western terrestrial garter snake (*Thamnophis elegans*) predation and influences on boreal toad tadpoles. The beetle larvae were discovered to not only eat the tadpoles, but also affect their foraging behavior, timing of metamorphosis, and size of young toads. Boreal toads appeared to occur more frequently at ponds without tiger salamanders and predacious diving beetles.

Though occasionally and locally catastrophic, predation of boreal toad life stages is a naturally occurring association between predator and prey. Small breeding sites could be impacted by predation, but there is no evidence that predation or the introduction of nonnative predators has resulted in the range-wide decline in toad numbers. If toad numbers continue to decline localized predator control may be desirable.

Available data indicate that boreal toad populations have decreased substantially over the past 15 years. Additionally, declines in several other pond-breeding amphibians have been noted (Hayes and Jennings 1986; Stolzenburg 1989) and several causes have been proposed, including acid precipitation (Harte and Hoffman 1989), application of fish toxicants (Burruss 1982), droughts (Corn and Fogleman 1984), pollution, increased incidence of ultraviolet radiation (Carey 1993), and natural population fluctuations (Pechman et al. 1991).

Several of these factors may be relevant to the decline of boreal toad populations. For instance, drought has been implicated in localized amphibian reproductive failures and extinctions, but it is unlikely that it can be applied as the underlying factor responsible for declines in a wide-ranging, long-lived amphibian such as the boreal toad. Weather conditions could not be determined to be a factor in the toad declines over the last 30 years. Research into a combination of pH, metal contamination, and water temperature was conducted (Carey et al. 1999), but it concluded that temperature in the study was so low as to mask any effects from pH or metals. A similar study with warmer temperatures was determined to be needed. Further research is proposed to determine if temperature plays a role in infection of the chytrid. In the 1980's, researchers examined inputs of acid-producing anions to the mountains of Colorado and Wyoming and concluded that acid precipitation was unlikely to have caused or contributed to the decline of boreal toads (Corn and Vertucci 1992). However, proposed research will examine pH effects on infection of the chytrid fungus.

Fish toxicants are used widely in Wyoming to manage sport fisheries and reestablish native fish populations. Extremely high concentrations of rotenone (5 :1/l) have been shown to cause mortality in larval leopard frogs (*Rana pipiens*) in controlled conditions (Burruss 1982). The effect of rotenone use under field conditions and concentrations on boreal toads is unknown.

Another fish toxicant, antimycin, was used in Lost Lake, Rocky Mountain National Park, during 1986. Information on the presence of boreal toad larvae and the effects of antimycin treatment were not gathered, but subsequent amphibian surveys of Lost Lake since 1990 indicate a large adult population and reproductive effort over the next several years. Antimycin was also used in 1990 to eradicate fish in Spruce Lake, Rocky Mountain National Park. After treatment, late stage larval boreal toads were found dead, but the overall effect on the 1990-year class was unknown (David Stevens, Rocky Mountain National Park, pers. comm. 1993).

The potential effects of pollution, ultraviolet radiation and natural population fluctuations remain unknown and may be working synergistically with other environmental or anthropogenic factors to cause declines in toad populations. Research on the effects of UV-B radiation determined that current levels of UV-B in the environment do not affect boreal toads. Additional studies are proposed to determine if UV-B facilitates chytrid fungus invasion.

Effects of the Proposed Rawlins Field Office RMP

Mitigation actions and conservation measures are discussed above and in the “Analysis of Management Actions and Effects Determinations” section of this BA.

Determination: Under the Rawlins Field Office Resource Management Plan it is determined that the following impacts have been determined for western boreal toad:

- Forestry, Lands and Realty, Livestock Management, Vegetation, Wildlife and Fish, and Water Quality, Watershed, and Soils Management —MI
- Air Quality, Cultural, Fire and Fuels Management, Minerals, OHV Use, Paleontology, Recreation Resources, Visual, Wild Horse Management, Special Management Areas, and Transportation and Access Management—NI

For a further clarification on these determinations refer to the “Analysis of Management Actions and Effects Determinations” section.

Blowout Penstemon

Threats from Human Activity

No long-term trend data is available on the Wyoming population. The cause of the sharp decline in the Nebraska population is also unknown, although wildfire control, severe drought, improvements in range management, leveling of sand dunes, and outbreaks of pyralid moths have all been identified as causes (Fertig, 2000).

Some evidence indicated drought might be the primary threat to the existence of the species. In years with lower than normal precipitation or in the end period of intensive grazing, livestock have been observed to closely graze almost every available plant when more favorable forage is limited.

Sand mining near Ferris Mountains occurs near the recreational area near Seminoe Road. Sand removed from the area is used for golf courses. Mining in habitats of known populations is not feasible due to the isolated and rugged terrain where known populations are found.

Oil and gas exploration and development have the potential to negatively impact the plants habitat. However, leasing activities within penstemon habitats would be avoided and companies would be required to move pads to adjacent areas and drill diagonally.

Invasive and noxious weeds have the potential to threaten habitat and populations of penstemon due to competition with weeds. Weed control activities could have a negative affect on the penstemon, and the use of pesticides could have the potential to negatively affect the penstemon’s pollinators.

OHV activity may have both beneficial and negative impacts to penstemon and its habitat. OHV activities may ensure continued soil disturbance and erosion possibly creating new habitat; however, driving over plants could cause mortality.

Effects of the Proposed Rawlins Field Office RMP

Although surveys of known potential habitat within the planning area concluded there were no populations of the blowout penstemon, effects from development activities (e.g. oil and gas, livestock management, or recreation) could occur because of the future possibility of finding additional habitat within the planning area.

Determination: Under the Rawlins Field Office Resource Management Plan it is determined that the following impacts have been determined for blowout penstemon:

- Livestock Management —LAA
- Air Quality, Cultural, Fire and Fuels Management, Lands and Realty, Minerals, Recreation Resources, Vegetation, Wildlife and Fish, Transportation and Access Management, and Water Quality, Watershed, and Soils Management —NL-i

- OHV Use—NL-d
- Special Management Areas—NL-b
- Forestry, Paleontology, Visual, and Wild Horse Management—NE

For a further clarification on these determinations refer to the “Analysis of Management Actions and Effects Determinations” section.

Ute Ladies’-Tresses

Threats from Human Activity

The species is threatened primarily by habitat loss and modification, though its small populations and low reproductive rate make it vulnerable to other threats.

The riparian and wetland habitats required by this species have been heavily impacted by urban development, heavy grazing, stream channelization, water diversions, and other watershed and stream alterations that reduce the natural dynamics of the stream system, recreation, and invasion of habitat by exotic plant species (USFWS 1995).

The effects of grazing are largely not known. The largest populations of the species, in Utah and Colorado, are grazed during the winter, when it is dormant, with no noticeable effect on the species. It is plausible that moderate winter grazing maybe beneficial to the species.

Due to the low reproductive rate, any loss of individual plants due to collection could have a major effect on the species’ survival. If individual plants or flowers were collected, it could reduce the reproductive potential of the affected population significantly.

Effects of the Proposed Rawlins Field Office RMP

Due to the fact that no known populations occur on lands managed by the Rawlins field office, there would No Effect (NE) to this plant. However, if populations were to be found within the RFO and on lands managed by BLM, additional measures would need to be taken to protect this plant and the effects would have to be re-determined. Further mitigation actions and conservation measures are discussed in the “Analysis of Management Actions and Effects Determinations” section of this BA.

Determination: Under the Rawlins Field Office Resource Management Plan it is determined that the following impacts have been determined for Ute ladies’-tresses:

- Livestock Management —LAA
- Cultural, Fire and Fuels Management, Lands and Realty, Vegetation, Wildlife and Fish, Transportation and Access Management, and Water Quality, Watershed, and Soils Management —NL-i
- Minerals, OHV Use, and Recreation Resources —NL-d
- Special Management Areas—NL-b
- Air Quality, Forestry, Paleontology, Visual, and Wild Horse Management—NE

For a further clarification on these determinations refer to the “Analysis of Management Actions and Effects Determinations” section.

Colorado Butterfly Plant

Threats from Human Activity

In general, threats to the species across its range include haying, grazing, herbicide spraying and urban expansion. Fertig (2001) suggests the primary threat may be vegetative succession in the absence of periodic disturbances that makes habitat unsuitable for seedling establishment. Other threats to the Colorado butterfly plant are the spraying of broadleaf herbicides, agricultural conversion of riparian areas, water diversions, channelization, and urban development.

Competition from non-native invasive plants can be a significant threat to the plant and reduce population numbers. Efforts to control Canada thistle and other invasive species with chemicals can pose a direct threat to the species. In addition, many chemicals are restricted for use within riparian zones. Invasive species are often spread by livestock management and recreational activities but can also be spread by other land management activities.

Effects of the Proposed Rawlins Field Office RMP

Activities that may occur on BLM lands that are likely to affect this plant include recreation, livestock management, vegetation management and cultural site development. However, these actions will be subject to review to prevent loss of populations or their habitat.

Determination: Under the Rawlins Field Office Resource Management Plan it is determined that the following impacts have been determined for Colorado butterfly plant:

- Livestock Management—LAA
- Cultural, Fire and Fuels Management, Forestry, Lands and Realty, Vegetation, Wildlife and Fish, Transportation and Access Management, and Water Quality, Watershed, and Soils Management—NL-i
- Minerals, OHV Use, and Recreation Resources—NL-d
- Special Management Areas—NL-b
- Air Quality, Paleontology, Visual, and Wild Horse Management—NE

For a further clarification on these determinations refer to the “Analysis of Management Actions and Effects Determinations” section.

Platte River Species Water Depletions

Threats from Human Activity

Threats to the Platte River Species will be identified under species listed below.

Effects of the Proposed Rawlins Field Office RMP

Activities that may occur on BLM lands that are likely to affect these species include water depletions from the following programs: fire and fuels management, lands and realty management, livestock management, minerals management, wildlife and fish management, and watershed management. However, these actions will be subject to review to prevent loss of their habitat.

Determination: Under the RFO RMP, it is determined that the following resource programs have the potential to cause water depletions to the Platte River system:

- Fire and Fuels Management, Lands and Realty, Livestock Management, Minerals, Wildlife and Fish, and Water Quality, Watershed, and Soils Management —LAA
- Air Quality, Cultural, Forestry, OHV Use, Paleontology, Recreation Resources, Vegetation, Visual, Wild Horse Management, Special Management Areas, and Transportation and Access Management—NE

For a further clarification on these determinations refer to the “Analysis of Management Actions and Effects Determinations” section.

Whooping Crane and Critical Habitat

Threats due to Human Activities

Primary threats due to human activities include draining wetland habitats, coastline development, and human activity near breeding and nesting sites.

Effects of the Proposed Rawlins Field Office RMP

Activities within the RMPPA that result in a water depletion to the Platte River system will have a negative affect on this species and its critical habitat downstream. Implementation of the Rawlins RMP is likely to adversely affect the Whooping Crane and is likely to adversely affect designated Critical Habitat for the Whooping Crane.

Eskimo Curlew

Threats due to Human Activities

The Eskimo Curlew appears near the brink of extinction. Any activity that disturbs migratory habitats (including wet meadows along the central Platte River in Nebraska) is detrimental to the persistence of this species.

Effects of the Proposed Rawlins Field Office RMP

Activities within the RMPPA that result in a water depletion to the Platte River system will have a negative affect on this species downstream. Implementation of the Rawlins RMP is likely to adversely affect the Eskimo Curlew.

Piping Plover and Critical Habitat

Threats due to Human Activities

Flood abatement activities such as water diversions that permit shoreline vegetation to flourish and human activity in general threaten piping plover habitats and populations. Alterations of water flow change the structure of sandbars preferred for nesting (though the birds nest on sandy shores as well), and irregular flows may flood nests, or leave the sandbar connected to the shore and more vulnerable to predation.

Effects of the Proposed Rawlins Field Office RMP

Activities within the RMPPA that result in a water depletion to the Platte River system will have a negative affect on this species and its critical habitat downstream. Implementation of the Rawlins RMP is likely to adversely affect the Piping Plover and is likely to adversely affect designated Critical Habitat for the Piping Plover.

Interior Least Tern

Threats due to Human Activities

Loss of gravel sand bars along rivers due to flow regulation threatens least tern populations. In addition, human disturbance in nesting areas negatively affects nesting success.

Effects of the Proposed Rawlins Field Office RMP

Activities within the RMPPA that result in a water depletion to the Platte River system will have a negative affect on this species downstream. Implementation of the Rawlins RMP is likely to adversely affect the Interior Least Tern.

Pallid Sturgeon

Threats due to Human Activities

Human activities such as recreation (e.g. fishing) and industrial and water development projects can adversely affect the viability of the Pallid sturgeon. Recreational activities such as fishing can cause unintended mortality to individual fish due to induced stress experienced during capture and release. In addition, industrial and water-development projects can degrade water quality conducive to supporting Pallid sturgeon life stages. Moreover, these projects and activities have drastically fragmented pallid sturgeon habitats and populations and they have substantially altered the habitat conditions that are preferred by the Pallid sturgeon.

Effects of the Proposed Rawlins Field Office RMP

Activities within the RMPPA that result in a water depletion to the Platte River system will have a negative affect on this species downstream. Implementation of the RFO RMP is likely to adversely affect the Pallid sturgeon.

Western Prairie Fringed Orchid

Threats from Human Activity

The major factor contributing to the decline of this species is the conversion of native prairie to croplands.

Effects of the Proposed Rawlins Field Office RMP

Activities within the RMPPA that result in a water depletion to the Platte River system will have a negative affect on this species downstream. Implementation of the RFO RMP is likely to adversely affect the Western Prairie Fringed Orchid.

Colorado River Species Water Depletions

Threats from Human Activity

Threats to the Colorado River Species will be identified under species listed below.

Effects of the Proposed Rawlins Field Office RMP

Activities that may occur on BLM lands that are likely to affect these species include water depletions from the following programs: fire and fuels management, lands and realty management, livestock

management, minerals management, wildlife and fish management, and watershed management. However, these actions will be subject to review to prevent loss of their habitat.

Determination: Under the RFO RMP, it is determined that the following resource programs have the potential to cause water depletions to the Colorado River system:

- Fire and Fuels Management, Lands and Realty, Livestock Management, Minerals, Wildlife and Fish, and Water Quality, Watershed, and Soils Management—LAA
- Air Quality, Cultural, Forestry, OHV Use, Paleontology, Recreation Resources, Vegetation, Visual, Wild Horse Management, Special Management Areas, and Transportation and Access Management—NE

For a further clarification on these determinations refer to the “Analysis of Management Actions and Effects Determinations” section.

Colorado Pikeminnow and Critical Habitat

Threats due to Human Activities

Colorado pikeminnow populations have been dramatically reduced throughout their historic range due to past and present human activities. Pervasive threats to this species are due to habitat alterations resulting from water development and diversions. However, non-native fish introductions are the most pressing impediment to the recovery of this species; predatory, non-native fishes profoundly affect recruitment by consuming juveniles (Minckley et al. 2003). Recovery efforts, however, are expanding the abundance and distribution of this species where the effects of habitat fragmentation and habitat alteration can be directly addressed.

Effects of the Proposed Rawlins Field Office RMP

Activities within the RMPPA that result in a water depletion to the Colorado River system will have a negative affect on this species and its critical habitat downstream. Implementation of the RFO RMP is likely to adversely affect the Colorado pikeminnow and is likely to adversely affect designated Critical Habitat for the Colorado pikeminnow.

Razorback Sucker and Critical Habitat

Threats due to Human Activities

The abundance and distribution of the razorback sucker has been dramatically reduced because of water developments such as dams and water diversions. In addition, the introduction of non-native trout into the historical habitats of the razorback sucker has almost eliminated their recruitment and survival (Minckley et al. 2003). Incidental catch by recreational anglers may pose a threat due to stress-caused direct and delayed mortality.

Effects of the Proposed Rawlins Field Office RMP

Activities within the RMPPA that result in a water depletion to the Colorado River system will have a negative affect on this species and its critical habitat downstream. Implementation of the RFO RMP is likely to adversely affect the razorback sucker and is likely to adversely affect designated Critical Habitat for the razorback sucker.

Bonytail and Critical Habitat

Threats due to Human Activities

The bonytail is the most imperiled fish among the federally-listed fish species native to the Colorado River drainage. Water development projects and activities such as dams and water diversions have caused a nearly catastrophic decline in bonytail populations and in preferred habitats. Further, the introductions of non-native trout in the Colorado River drainage have contributed to the decline in bonytail abundance and distribution due to predation.

Effects of the Proposed Rawlins Field Office RMP

Activities within the RMPPA that result in a water depletion to the Colorado River system will have a negative affect on this species and its critical habitat downstream. Implementation of the RFO RMP is likely to adversely affect the bonytail and is likely to adversely affect designated Critical Habitat for the bonytail.

Humpback Chub and Critical Habitat

Threats due to Human Activities

The humpback chub is not as abundant as it was historically. Water development and introduced trout have affected the abundance and distribution of the humpback chub. Dams have altered the timing, duration, and magnitude of annual flows that provided suitable and preferable habitats for the humpback chub. Further, non-native trout have affected humpback chub abundance due to predation.

Effects of the Proposed Rawlins Field Office RMP

Activities within the RMPPA that result in a water depletion to the Colorado River system will have a negative affect on this species and its critical habitat downstream. Implementation of the RFO RMP is likely to adversely affect the humpback chub and is likely to adversely affect designated Critical Habitat for the humpback chub.

Specific Effects Determinations for Each Species and Each BLM-Administered Program

Air Quality

Activity Description Summary

Gather meteorological and air quality data to monitor air quality components and conduct dust control measures. Individuals would be required to travel to various monitoring sites to collect meteorological and air quality data.

Surface disturbing and other activities associated with the air quality program include, but are not limited to, the following actions: collection of meteorological and/or air quality data, application of dust control measures, and covering of conveyor belts at mines sites (Table 7).

Impact Analysis and Effects Determination

Activities associated with the air quality program *May Affect, but are not Likely to Adversely Affect (NL-i)* the black-footed ferret. The collection of meteorological and/or air quality data, application of dust

control measures, and covering of conveyor belts at mines sites would have an insignificant effect on this species. This determination was reached because this program and its associated activities are generally not located in prairie dog towns, black-footed ferret habitat and as such they are not likely to have an adverse effect on the black-footed ferret. If a project is proposed within potential black-footed ferret habitat, the project will be relocated to avoid habitat or a survey will be completed to determine if ferrets are present.

Cultural Resources

Activity Description Summary

Record and inventory cultural resources (including excavation and photography), develop interpretive sites, use hand tools and power tools, stabilize deteriorating buildings and resources, fence cultural sites and manage historical trails.

Surface disturbing and other activities associated with the cultural resources program include, but are not limited to, the following actions: record cultural resources; inventory cultural resources; develop interpretive sites; use hand tools, power tools, heavy machinery (surface disturbing); stabilize deteriorating buildings/resources; fence cultural resources; and temporary campgrounds (Table 7).

Impact Analysis and Effects Determination

The identification and recordation of cultural resources including excavation with hand tools and power tools, photography, stabilization of deteriorating buildings/resources, fencing of cultural resources, development of interpretive sites and temporary camp sites within the Cultural Resource Program *May Affect, but are not Likely to Adversely Affect (NL-d or NL-i)* the black-footed ferret. Development may expose ferrets to increased human activity and surface disturbing activities associated with site development. This may result in displacement of ferrets, disruption of the animal's life activities, and harassment. However, these activities are highly unlikely to be located within black-footed ferret habitat because prairie dog towns are avoided by 50 meters or black-footed ferret surveys are completed if avoidance is not possible.

The identification and recordation of cultural resources including excavation with hand tools and power tools, photography, stabilization of deteriorating buildings/resources, fencing of cultural resources, development of interpretive sites and temporary camp sites within the Cultural Resource Program *May Affect, but are not Likely to Adversely Affect (NL-d or NL-i)* the Preble's meadow jumping mouse. In general, these activities are short-term in nature, lasting usually less than one day with individuals walking through the riparian areas. Archaeological inventory involves walking and scanning the ground surface constantly for cultural resources, thus individuals are always aware of where they are stepping; although a mouse could be stepped on or disturbed, highly unlikely to occur. Fencing activities are usually short in duration and temporary in nature. Camp sites would not be established within riparian areas, rather, within existing disturbance areas away from potential habitat; therefore it is highly unlikely that a mouse would be disturbed and/or impacted by this activity.

The identification and recordation of cultural resources, fencing of cultural resources, and temporary camp sites within the Cultural Resource Program *May Affect, but are not Likely to Adversely Affect (NL-d or NL-i)* the Preble's meadow jumping mouse critical habitat; these actions would have an insignificant affect on this species. In general, these activities are short-term in nature, lasting usually less than one day with individuals walking through the riparian areas. Archaeological inventory involves walking and scanning the ground surface constantly for cultural resources, thus individuals are always aware of where they are stepping; although a mouse could be stepped on or disturbed, it is highly unlikely to occur.

Camp sites would not be established within riparian areas, rather within existing disturbance areas away from potential habitat; therefore it is highly unlikely that a mouse would be disturbed and/or impacted by this activity.

The identification and recordation of cultural resources including excavation with hand tools and power tools, photography, and stabilization of deteriorating buildings/resources within the Cultural Resource Program *May Affect, but are not Likely to Adversely Affect (NL-I or NL-d)* the Canada lynx. In general, these activities are short-term in nature, lasting usually less than one day with individuals walking through the spruce/fir and/or riparian areas. Archaeological inventory involves walking and scanning the ground surface constantly for cultural resources, thus human activity at these sites may alter movement within migration corridors, however it is highly unlikely. These actions would have an insignificant affect on this species. Stabilization of buildings would occur in migration and transition corridors on an infrequent basis, thus human activity at these sites may alter movement within migration corridors; however it is highly unlikely and would have an immeasurable effect on the species. There is no identified Canada lynx habitat within the RFO, only migration corridors.

The identification and recordation of cultural resources including excavation with hand tools and power tools, photography, stabilization of deteriorating buildings/resources, fencing of cultural resources, development of interpretive sites and temporary camp sites within the Cultural Resource Program *May Affect, but are not Likely to Adversely Affect (NL-d or NL-i)* the bald eagle. In general, these activities are short-term in nature, lasting usually less than one day with individuals walking through the riparian areas. Archaeological inventory involves walking and scanning the ground surface constantly for cultural resources, thus human activity at these sites may temporarily displace bald eagles or reduce nest productivity, however it is highly unlikely. These actions would have an insignificant effect on this species. Stabilization of buildings would occur in nesting and roosting habitat on an infrequent basis, thus human activity at these sites may temporarily displace nesting and roosting bald eagles; however it is highly unlikely and would have an immeasurable effect on the species because of restrictions on disruptive activities within specified buffer zones and during sensitive periods.

The identification and recordation of cultural resources including excavation with hand tools and power tools, photography, stabilization of deteriorating buildings/resources, fencing of cultural resources, and development of interpretive sites within the Cultural Resource Program *May Affect, but are not Likely to Adversely Affect (NL-d or NL-i)* the Wyoming toad. In general, these activities are short-term in nature, lasting usually less than one day with individuals walking through the riparian areas. Archaeological inventory involves walking and scanning the ground surface constantly for cultural resources, thus human activity at these sites may temporarily displace toads, however the likelihood is insignificant because of avoidance measures to reduce disruptive activities within Wyoming toad habitat.

The identification and recordation of cultural resources including excavation with hand tools and power tools, photography, stabilization of deteriorating buildings/resources, fencing of cultural resources, and development of interpretive sites within the Cultural Resource Program *May Affect, but are not Likely to Adversely Affect (NL-d or NL-i)* the blowout penstemon, Colorado butterfly plant, and Ute ladies'-tresses; these actions would have an insignificant affect on these species. In general, these activities are short-term in nature, lasting usually less than one day with individuals walking through potential habitat. Archaeological inventory involves walking and scanning the ground surface constantly for cultural resources, thus the potential for stepping on, and destroying any of the species may occur; however, it is highly unlikely, and thus insignificant. Construction of fences, temporary campsites, development of interpretive sites, and stabilization activities would require plant surveys. Surveys would result in designation of avoidance areas to ensure protection of individual plants.

Fire and Fuels Management

Activity Description Summary

The two main programs include fuels treatments (including biological, chemical, prescribed burning and mechanical treatments) and wildfire suppression. Fuels treatments are used to enhance natural resources in the area, dispose of slash and residue from timber sales, reduce fuels levels before a treatment activity, and improve habitat and rangeland health. During these activities, the BLM evaluates areas on a case-by-case basis, writes activity plans, coordinates with interested parties and conducts the treatments.

Fire suppression activities are done on an emergency basis. Fire suppression activities include pre-planning, vary with intensity of the wildfire, and use equipment (off-road vehicles, hand tools, aviation, heavy equipment), use fire lines, use chemical fire suppression, and rehabilitates the sites (Burned Area Emergency Rehabilitation). Acres of wildfire fluctuate annually.

Surface disturbing and other activities associated with the fire and fuels management program include, but are not limited to, the following actions: fire suppression, damage rehabilitation, prescribed burning, construct firelines, use off road vehicles, use hand tools and heavy equipment (includes bulldozers), use chemical fire suppression agents (ground based), and the use of fire retardant drops containing chemical dyes (aircraft dispersal) (Table 7).

Impact Analysis and Effects Determination

Fire and fuels management activities *May Affect, but are not Likely to Adversely Affect (NL-d or NL-i)* the black-footed ferret. It is highly unlikely that management activities would occur in a prairie dog town. If these activities were to occur they would have an immeasurable effect on the species.

Prescribed burning activities within the fire and fuels management program *May Affect, and is Likely to Adversely Affect (LAA)* the Preble's meadow jumping mouse and critical habitat. The use of motorized vehicles and human traffic may result in the loss of an individual. Although there might be a temporary reduction in population through burn activities, overall habitat would be enhanced, resulting in long term increases in population.

Additional activities, including fire suppression, rehabilitation, fireline construction, use of off road vehicles, within the fire and fuels management program *May Affect, but are not Likely to Adversely Affect (NL-d or NL-i)* the mouse and critical habitat; these actions would have an insignificant effect on these species. Any displacement of species or damage to critical habitat would be immeasurable due to timing and proper distance restrictions of planned activities. Riparian areas are used as natural firebreaks during wildfires, so these actions rarely occur in this habitat.

The fire and fuels management program *May Affect, but is not Likely to Adversely Affect (NL-d or NL-i)* the Canada lynx. Human activities associated with fire and fuels management activities may lead to alterations in migration patterns of Canada lynx.

Fire and fuels management activities *May Affect, but are not Likely to Adversely Affect (NL-d)* the bald eagle. These actions would have an immeasurable effect on the species because of restrictions on disruptive activities within specified buffer zones and during sensitive periods.

Fire and fuels management actions, *May Affect, but are not Likely to Adversely Affect (NL-d or NL-i)* the Wyoming toad; these actions would have an insignificant affect on the species. Human activity associated with fire and fuels management may temporarily displace toads, however the likelihood is

insignificant because of avoidance measures to reduce disruptive activities within Wyoming toad habitat. Additionally, it is highly unlikely that these types of activities will occur within Wyoming toad habitat.

Fire suppression, prescribed burning, construction of fire lines, the use of chemical fire suppression agents (ground based) and fire retardant drops containing chemical dyes (aircraft dispersal) within the fire and fuels management program *May Affect, and is Likely to Adversely Affect (LAA)* the Platte River and Colorado River species. Fire and fuels management actions that require the drawing of water from the Platte or Colorado River systems would result in water depletion. Water depletion reduces minimum flows to downstream species, resulting in loss of habitat.

The fire and fuels management program activities except for prescribed burns *May Affect, but are not Likely to Adversely Affect (NL-d or NL-i)* the Blowout Penstemon, Colorado butterfly plant and Ute Ladies'-Tresses. Although there might be a temporary reduction in population through burn activities, overall habitat would be enhanced, resulting in long term increases in population. Prescribed burns in adjacent areas to known blowout penstemon stands would have a beneficial impact (*NL-b*) on species by allowing for the expansion of active dunes, which increases habitat.

Forestry

Activity Description Summary

The BLM's Forestry program activities include timber harvesting and managing the forest for other uses. Forest management activities for timber production includes 1) pre-harvesting practices: this includes cutting and removal of diseased trees; disease treatment by spraying; and pre-commercial thinning, chaining, and shearing; 2) timber harvesting practices: this includes timber harvesting; permits clearcuts; ensures slash disposal; allows commercial thinning, logging, skidder-type and cable yarding; construction of roads and landings; lopping, scattering, roller chopping, and burning of slash; and helicopter logging; 3) non-commercial timber harvesting practices: this includes: the collection and cutting of firewood, Christmas trees, posts, poles, and wildings; and 4) post-timber harvesting practices: this includes reclamation efforts including site regeneration and stand replacements; fencing regenerated areas; and rehabilitation surveys.

Forest management for other uses includes: assessment of forest health; livestock management; recreation management; wildlife habitat management; prescribed burning; acquisition of easements, pursuing legal access, allowing road development; and installing drain culverts and water bars.

Surface disturbing and other activities associated with the forestry management program include, but are not limited to, the following actions: rehabilitation surveys; timber harvesting; artificial regeneration (planting harvested areas, including new seedlings); fencing regenerated areas; clear cuts (including stand replacement); selective cutting; slash disposal; site regeneration (natural); pre-commercial thinning; collection of firewood, posts, poles, Christmas trees, and wildings; commercial thinning; skidder-type yarding; logging operations; cable yarding; road and landing construction; shearing; installation of drain culverts, water bars, or ditches; cut and remove diseased trees; lopped, scattered, roller chopped, or burned slash; helicopter logging; disease treatment sprayings; and spraying of grasses and shrubs (Table 7).

Impact Analysis and Effects Determination

Forestry management activities *May Affect, but are not Likely to Adversely Affect (NL-d or NL-i)* the black-footed ferret; these actions would have an insignificant affect on these species. In general, these activities do not occur within white-tailed or black-tailed prairie dog towns; however, there is the

potential to develop temporary access roads within or adjacent to these towns. It is highly unlikely that a black-footed ferret would be harmed, harassed and/or taken as a result of this action and these roads are temporary in nature and would be reclaimed. Disease treatment sprayings may occur within potential black-footed ferret habitat; however, these chemicals would not be toxic to ferrets, and towns would be avoided during application.

Forestry management activities *May Affect, but are not Likely to Adversely Affect (NL-d or NL-i)* Preble's meadow jumping mouse; these actions would have an insignificant affect on these species. Although highly unlikely, there is the potential that a person could step on a mouse during these activities or drive over a mouse in the lower elevations near riparian habitats. Disease treatment sprayings may occur within potential Preble's meadow jumping mouse habitat; however, these chemicals would not be toxic to the mice, and riparian habitat would be avoided during application.

The forest management program *May Affect, but are not Likely to Adversely Affect (NL-d or NL-i)* the Canada lynx. Timber harvesting, pre-commercial thinning, logging operations, road and landing construction, shearing, helicopter logging, disease treatments spraying and clear cuts would reduce cover associated with Canada lynx migration routes. These activities may occur within lynx travel corridors; however, the likelihood of disturbing a lynx is very low. Human activities associated with these actions may lead to short-term avoidance of these areas by Canada lynx

Selective cutting, slash disposal, site regeneration (natural), commercial thinning, cutting and removing diseased trees, and lopping, scattering, roller chopping, and burning of slash *May Affect, but is not Likely to Adversely Affect (NL-b)* the Canada lynx. These actions would improve forest health and result in having a beneficial affect on the species. Human activities associated with these actions may lead to short-term avoidance of these areas by Canada lynx; however, in general these actions may enhance habitat for prey species of the lynx.

The collection of firewood, posts, poles, Christmas trees, and wildings within the forest management program *May Affect, and is Likely to Adversely Affect (LAA)* the bald eagle. These activities are distributed throughout the RMPPA and may occur within the vicinity of bald eagle nests or roosts. These activities (except the collection of posts and poles) are casual use and are not limited to designated areas and may affect bald eagles by forcing them to seek other nesting and roosting sites. The collection of posts and poles occurs in designated areas and are located outside of known bald eagle habitat.

Forestry management actions that *May Affect, but are not Likely to Adversely Affect (NL-d or NL-i)* the bald eagle would not likely occur within riparian areas, nesting and roosting habitat for the bald eagle; therefore, impacts to this species as a result would not likely occur. Activities would be temporarily disruptive to bald eagles that may be nesting in the area. In addition, these actions may create habitat and hiding areas for some prey species for the eagles which would be a benefit. In general, mitigation practices would occur to prevent surface disturbing activities from occurring during nesting and roosting periods which would reduce and/or eliminate these impacts.

Installation of drain culverts, water bars or ditches and disease treatment sprayings within the forest management program *May Impact, but are not likely to contribute to the need for federal listing (MI)* of the Western boreal toad. Human disturbances associated with these activities could temporarily displace and disturb the Western boreal toad; and although an individual toad may be affected, the population as a whole would not be impacted. Depending on the type of chemical used for disease treatment sprayings, individual toads may be affected. However, forest health would be enhanced, resulting in long-term benefits to toad habitat.

Lands and Realty

Activity Description Summary

The lands and realty management program supports multiple-use management goals of the BLM resource programs; responds to public requests for land use authorizations. In support of other programs, the lands and realty program processes stock driveway and locatable mineral entry withdrawals, establishes protective withdrawals, pursues cooperative agreements, considers temporary use permits, considers new withdrawals, and leases acres for communication sites, recreation and public purposes. Authorizations include land tenure adjustment requests and land withdrawals. Right-of-way (ROW) authorizations include, but not limited to, access roads, well pads, pipelines, communication sites, ditches and canals, buried telephone lines, fiber optic lines and electrical distribution lines, wind energy sites, meteorological towers, and powerlines.

Surface disturbing and other activities associated with the lands and realty program include, but are not limited to, the following actions: establish withdrawals; acquisition of access easements; acquisition of conservation easements; disposal or transfer of public lands through Desert Land Entry, public sale, exchange, Wyoming indemnity selection, or Recreation and Public Purposes (RPP), leases, or patents; issue rights-of-ways (ROW) and leases; ROW powerlines; lease communication sites; ROW pipelines; ROW ditches and canals; ROW roads (includes stream crossings); ROW well pads; ROW reservoirs; ROW buried telephone and fiber optic lines; ROW wind power generation farms and facilities; ROW compressor stations and other facilities; temporary use permits; roads closures/rehabilitation; and designate, cancel or change stock trail driveways (Table 7).

Impact Analysis and Effects Determination

The lands and realty management actions *May Affect, and are not Likely to Adversely Affect (NL-d and NL-i)* the black-footed ferret. The disposal of public lands may impact black-footed ferret if there are prairie dog towns located in these parcels proposed for disposal. The overall goal of the RFO is to maintain lands that contain potential habitat for black-footed ferrets in public ownership; however, transfer of acreage due to land tenure actions may occur. Lands found to have black-footed ferret habitat would not be sold or exchanged unless it would benefit the species. Development of utility transportation corridors may increase the potential damage to the habitat for black-footed ferrets in these areas. ROWs and leases are evaluated to determine their impacts to black-footed ferret habitat, and where habitat is identified black-footed ferret surveys are completed to determine presence prior to surface disturbing activities. The issuance of temporary use permits will be evaluated to determine their impacts on habitats that may be associated with black-footed ferrets. Temporary use permits require an analysis to determine if black-footed ferrets are present in potential habitat areas. Designating stock driveways would potentially concentrate livestock to potential black-footed ferret habitat; however, these activities are short term in duration and impacts are determined to be minimal. As a result of these conservation practices impacts to black-footed ferret populations would not occur or would be immeasurable.

Establish withdrawals, acquisition of conservation easements, and roads closures/rehabilitation activities within lands and realty management program *May Affect, but are not Likely to Adversely Affect (NL-b)* the black-footed ferret; these actions would have a beneficial affect on these species. These actions close areas to surface disturbing activities that could have a negative affect on black-footed ferrets and their habitat and reduce potential for habitat fragmentation.

Rights-of-way/leases for powerlines, roads (includes stream crossings), and reservoirs within the lands and realty management program *May Affect, and is Likely to Adversely Affect (LAA)* the Preble's meadow jumping mouse and critical habitat. The crossing of streams may result in accidental loss of a Preble's

meadow jumping mouse; however the impacts to the populations would be immeasurable. Construction activities associated with issuance of rights-of-way (ROW) and leases may increase the potential for the loss of a Preble's meadow jumping mouse and may impact critical habitat in these areas. There would be localized impacts to populations and habitat in areas where construction and maintenance occurs. Large scale reservoirs would inundate mouse habitat; however, there are few reservoirs that have the potential to be constructed in these habitat types and are highly unlikely to occur. ROWs and leases are evaluated to determine their impacts to Preble's meadow jumping mouse and critical habitat, and where habitat are identified surface disturbing and destructive activities will be limited during critical time periods and within 300 feet of the 100 year flood plain reducing disturbance and loss to the mouse and the habitat.

Lands and realty management actions *May Affect, but are not Likely to Adversely Affect (NL-d)*, Preble's meadow jumping mouse and critical habitat. Livestock use of driveways usually occurs along roads and it is unlikely that Preble's meadow jumping mouse habitat would be disturbed. In the event that livestock cross riparian habitat it would be highly unlikely that they would step on a mouse and or a burrow. Disposal or transfer of public lands through Desert Land Entry, public sale, exchange, Wyoming indemnity selection, or Recreation and Public Purposes (RPP), leases or patents, and all other ROWs would have the potential to cause the loss of habitat or individuals. The issuance of temporary use permits would be evaluated to determine their impacts on habitats that may be associated with the Preble's meadow jumping mouse and their critical habitat. Temporary use permits require an analysis to determine if they are present in potential habitat areas. ROWs and leases are evaluated to determine their impacts to Preble's meadow jumping mouse and critical habitat, and where habitat are identified surface disturbing and disruptive activities will be limited during critical time periods and within 300 feet of the 100 year flood plain reducing disturbance and loss to the mouse and the habitat.

Establish withdrawals, acquisition of conservation easements, and roads closures/rehabilitation activities, *May Affect, but are not Likely to Adversely Affect (NL-b)* in Preble's meadow jumping mouse and critical habitat. These actions would have a beneficial affect on this species by closing areas and reducing vehicle access, thereby minimizing human presence and creating undisturbed habitat for mouse. These areas would also be reclaimed which would create additional habitat over the long-term.

The lands and realty management actions *May Affect, and is not Likely to Adversely Affect (NL-d and NL-i)* the Canada lynx. Livestock use of driveways usually occurs along roads and it is unlikely that Canada lynx would be disturbed. Disposal or transfer of public lands through Desert Land Entry, public sale, exchange, Wyoming indemnity selection, or Recreation and Public Purposes (RPP), leases or patents, and all other ROWs would have the potential to cause the loss of habitat or individuals. ROWs and leases are evaluated to determine their impacts to Canada lynx corridors and where habitat corridors are identified surface disturbing and disruptive activities will be limited. Disposal of lands with potential lynx habitat may affect the Canada lynx's ability to utilize travel corridors linking more desirable habitats found on the Medicine Bow National Forest. The overall goal of the RMPPA is to maintain lands that contain potential habitat for the Canada lynx; however, large transfer of acreage due to land tenure actions may occur. Temporary use permits require an analysis to determine if they are present in potential habitat areas and travel corridors. These impacts are short term and have limited impacts to the Canada lynx populations.

Establish withdrawals, acquisition of conservation easements, and roads closures/rehabilitation activities within lands and realty management program *May Affect, but are not Likely to Adversely Affect (NL-b)* Canada lynx. These actions would have a beneficial affect on this species by closing areas to surface disturbance, creating undisturbed habitat for lynx.

Rights-of-way/leases for utility transportation corridors, powerlines, roads (includes stream crossings), wind power generation facilities, and the issuance of temporary use permits within lands and realty

management program *May Affect, and are Likely to Adversely Affect (LAA)* the bald eagle. The issuance of temporary use permits will be evaluated to determine impacts on bald eagle habitats. Direct impacts may occur from construction activities and also from collisions with power lines, vehicles, and wind power generators. Eagles may avoid areas due to increased human presence.

Lands and realty management actions *May Affect, but are not Likely to Adversely Affect (NL-i and NL-d)* the bald eagle. The disposal of public lands may impact bald eagles if habitat were located in parcels proposed for disposal; however, the overall goal of the RFO is to maintain lands that contain habitat for bald eagles in public ownership. Lands found to have bald eagle habitat would not be sold or exchanged unless it would benefit the species. Although eagles may be displaced from increased human presence during construction, activity would not be allowed during critical time periods or within established buffer zones for roost and nest sites. After projects are constructed, there would be minimal disturbance.

Lands and realty management actions *May Affect, but are not Likely to Adversely Affect (NL-b)* the bald eagle. Establishment of withdrawals, acquisition of conservation easements, and road closures/rehabilitation activities would minimize human activity in roost or nest areas. Reservoirs may provide additional foraging areas which would have a beneficial affect to this species.

Lands and realty management actions *May Affect, but are not Likely to Adversely Affect (NL-i and NL-d)* the Wyoming toad. Disposal of lands with potential Wyoming toad habitat may affect the toad by the loss of federal protection afforded to riparian and wetland habitats for breeding and life strategies. Construction activities associated with ROWs may result in the direct loss of individuals and habitat. Most ROW projects are either buried beneath the surface, bored beneath riparian areas, and/or are located 500 feet from riparian habitat; therefore, the affects on the Wyoming toad are insignificant. Other ROW projects are unlikely to be constructed within the 100 year floodplain or within 100 feet of ephemeral channels as these are designated avoidance areas. Lands and realty management actions *May Affect, but are not Likely to Adversely Affect (NL-b)* the Wyoming toad. Establishment of withdrawals, acquisition of conservation easements, and road closures/rehabilitation activities would minimize human activity and increase Wyoming toad habitat. Rehabilitation of roads would replace habitat and withdrawals would ensure no mining activities occurred in toad habitat.

Rights-of-way/leases for utility transportation corridors, pipelines, roads (including stream crossings), well pads, reservoirs, and the issuance of temporary use permits within lands and realty management program *May Affect, and is Likely to Adversely Affect (LAA)* the Platte River and Colorado River species. In addition, ROWs for ditches and canals within lands and realty management program *May Affect, and is Likely to Adversely Affect (LAA)* the Colorado River species. Lands and realty management actions requiring the drawing of water from the Platte or Colorado River systems would result in water depletion. Water depletion reduces minimum flows to down stream species, resulting in loss of habitat. Disposal of lands that contain the headwaters of the Platte River and Colorado River systems may affect the Platte River and Colorado River species by increasing water depletion activities on disposed lands.

Disposal of lands, issuance of ROWs and leases, specifically ROWs for pipelines, roads, well pads, buried telecommunication lines, wind power generation farms and facilities, compressor stations, temporary use permits, and stock driveways, and the issuance of temporary use permits within the lands and realty management program *May Affect but are not Likely to Adversely Affect (NL-i and NL-d)* the blowout penstemon plant species. Disposal of lands that contain potential habitat for the blowout penstemon may affect the plants' ability to survive and reproduce depending upon the new management regime the land would be under. This would only occur if the State exercised its right to indemnity selection of land. No lands with identified habitat would be otherwise sold or exchanged; therefore the potential for this to occur is minimal. Issuance of ROWs and leases, specifically ROWs for pipelines, roads, well pads, buried telecommunication lines, temporary use permits, and stock driveways may

directly affect the blowout penstemon plant. Impacts may occur from construction or other surface disturbing activities and the resultant loss of habitat or individual plants. It may also result in the taking of these plants by collectors. The issuance of temporary use permits will be evaluated to determine their impacts on habitats that may be associated with the blowout penstemon plants. All ROWs require an analysis to determine if potential habitat is present in project areas. Areas containing known populations will be designated as an ACEC, therefore no actions will be authorized which would result in a negative impact to known plants or their habitat.

Establishment of withdrawals; acquisition of conservation easements; and road closures/rehabilitation activities within lands and realty management program *May affect, but are not likely to adversely affect (NL-b)* the blowout penstemon plant species; these actions would have a beneficial affect to this species. The withdrawals would ensure that no mining activity occurred in identified habitat. The rehabilitation activities would help restore habitat for the penstemon. These actions would enhance the ACEC management actions to protect the plants and their habitat.

Disposal of lands, issuance of ROWs and leases, specifically ROWs for pipelines, roads, well pads, buried telecommunication lines, wind power generation farms and facilities, compressor stations, temporary use permits, and stock driveways, and the issuance of temporary use permits within the lands and realty management program *May Affect but are not Likely to Adversely Affect (NL-i and NL-d)* the Colorado butterfly plant and Ute ladies'-tresses plant species. Disposal of lands that contain potential habitat for these species may affect the plants' ability to survive and reproduce depending upon the new management regime the land would be under. This would only occur if the State exercised its right to indemnity selection of land. No lands with identified habitat would be otherwise sold or exchanged; therefore the potential for this to occur is minimal. Issuance of ROWs and leases, may directly affect these species. Impacts may occur from construction or other surface disturbing activities and the resultant loss of habitat or individual plants. It may also result in the taking of these plants by collectors. The issuance of temporary use permits will be evaluated to determine their impacts on habitats that may be associated with these plants. In general, these activities, if authorized, would be constructed 500 feet from riparian habitat; therefore, impacts to the Colorado butterfly plant and the Ute ladies'-tresses as a result of implementing these projects would be insignificant. An analysis would be completed and mitigation identified prior to authorization for those projects that are located within habitat to prevent disturbance to these plants. All ROWs require an analysis to determine if potential habitat is present in project areas.

Establishment of withdrawals; acquisition of conservation easements; and road closures/rehabilitation activities within lands and realty management program *May affect, but are not likely to adversely affect (NL-b)* the Colorado butterfly plant and the Ute ladies'-tresses plant species; these actions would have a beneficial affect to this species. The withdrawals and easements would ensure that no mining activity or other surface disturbing activity occurred in identified habitat. The rehabilitation activities would help restore habitat for these plants and may increase potential habitat. These actions would have a beneficial affect on the two plant species by leaving habitat intact and reducing and/or eliminating the potential for disturbance.

The disposal or transfer of public lands through Desert Land Entry, public sale, exchange, Wyoming indemnity selection, or Recreation and Public Purposes (R&PP) leases or patents or designating utility transportation corridors within the lands and realty management program *May Impact, but are not likely to contribute to the need for federal listing (MI)* of the Western yellow-billed cuckoo. Surface disturbing activities resulting from the located within cuckoo habitat has the potential to affect the birds; however, the likelihood is minimal due to standard operating practices, required mitigation, and the lack of identified habitat in the RMPPA. These activities will be located outside a 500 foot buffer from riparian areas containing habitat; therefore, impacts to the species would be minimal. No surface disturbing or

disruptive activities will be allowed within ½ mile of identified habitat during the nesting period. This will further reduce any potential impact to the birds or their habitat.

The disposal or transfer of public lands through Desert Land Entry, public sale, exchange, Wyoming indemnity selection, or Recreation and Public Purposes (R&PP) leases or patents; issuance of right-of-ways (ROW) and leases for (utility transportation corridors), roads (includes stream crossings), and reservoirs within the lands and realty management program *May Impact, but are not likely to contribute to the need for federal listing (MI)* of the Western boreal toad. Surface disturbing activities resulting from these actions within toad habitat have the potential to result in the loss of a toad or its habitat; however, the likelihood is minimal due to standard operating practices and required mitigation. In general, most of these activities are located outside riparian habitat; therefore, impacts to the species would be minimal. Where toad habitat is present, construction activities located within 500 ft of open water and/or 100 ft of intermittent or ephemeral channels would only be allowed on a case-by-case basis. Stream crossings for roads and pipelines will be constructed during the period of lowest flow (i.e., late summer or fall) and perpendicular to flow. These measures will further reduce any potential impact to the Western boreal toad or its habitat.

Livestock Management

Activity Description Summary

The livestock management program includes the following management actions: livestock management, vegetation treatments, and range improvements. Livestock management includes authorizing livestock grazing, livestock conversions; permit authorizations, placements of salt and mineral supplements, and herding of livestock. Vegetation treatments include the use of prescribed fire; chemical, mechanical, and biological treatments; noxious and invasive weed control. Range improvements include fence construction and maintenance, water developments, and in-stream structures.

Surface disturbing and other activities associated with the livestock management program include, but are not limited to, the following actions: 1) livestock conversion; 2) livestock grazing authorization (adjust season of use, distribution, kind, class, and numbers of livestock); 3) construct exclosures; 4) design, implement, and monitor grazing systems; 5) construct, maintain, and modify fences; 6) develop water facilities (catchments, reservoirs, springs, pipelines, in-stream structures, and wells); 7) supplemental feeding authorization (Table 7).

Impact Analysis and Effects Determination

The livestock management program *May Affect, but are not Likely to Adversely Affect (NL-i and NL-d)* the black-footed ferret. The development of water facilities may affect the black-footed ferret during construction and maintenance of these catchments, reservoirs, springs, pipelines, in-stream structures and wells due to the displacement of prey habitat and human presence during construction. There is the possibility of drowning in water tanks. There is also the possibility that these habitat modifications would result in greater presence of predators to black-footed ferrets (e.g. coyotes). Livestock grazing authorization (adjust season of use, distribution, kind, class, and numbers of livestock); construction of exclosures; implementation and monitoring of grazing systems; construction, maintenance, and modification of fences; and supplemental feeding authorization would have an insignificant affect on these species. Surveys would be conducted in potential ferret habitat prior to any activity which would potentially affect ferrets to minimize the chance of harming or disturbing them. Also, at this time, no ferrets have been located outside the Shirley Basin in the RMPPA; therefore, the chance is further reduced of disturbing ferrets.

Developing water facilities (catchments, reservoirs, springs, pipelines, in-stream structures, and wells) within the livestock management program *May Affect, and is Likely to Adversely Affect (LAA)* the Preble's meadow jumping mouse and critical habitat. Developing these water facilities in Preble's habitat would disturb or inundate habitat and possibly result in the loss of individuals. Increased human activity during water facility construction operations could temporarily displace the Preble's meadow jumping mouse. Vehicle and equipment use during construction activities may result in the loss of a Preble's meadow jumping mouse. Additionally, indirect impacts to habitat could occur from the concentration of livestock in new areas, increasing disturbance in certain areas and reducing disturbance in others. The concentration of livestock would result in degradation or loss of habitat including loss of cover, soil compaction, however, off-channel water developments would reduce these impacts to the riparian areas and mouse habitat. To reduce this possibility, there will be no surface disturbing or other activities within identified or known breeding habitat between May 15 and August 15 and activity within identified hibernaculum between August 16 and May 14 would be intensively managed. There is also the possibility that these habitat modifications would result in greater presence of predators to Preble's meadow jumping mice, e.g. coyotes.

The livestock management program *May Affect, and is not Likely to Adversely Affect (NL-d)* the Preble's meadow jumping mouse and critical habitat. Increased human activity during fence and enclosure construction operations could temporarily displace the Preble's meadow jumping mouse. Vehicle use during construction and maintenance activities may result in the loss of a Preble's meadow jumping mouse. Riparian enclosures would improve riparian health by removing negative affects from livestock grazing, thereby maintaining or enhancing Preble's habitat. Additionally, indirect impacts to habitat could occur from the concentration of livestock in new areas, increasing disturbance in certain areas and reducing disturbance in others. The concentration of livestock (e.g. funneling of activity along fences) would result in degradation or loss of habitat including loss of cover, soil compaction, however, livestock conversions may affect Preble's meadow jumping mouse and their critical habitat based on the change in forage utilization that may potentially reduce amount of cover used by these species. Currently, in potential Preble's habitat and designated critical habitat, there are no grazing authorizations for sheep. New sheep authorizations will not be permitted within nine miles of Bighorn sheep habitat which will eliminate cattle to sheep conversions in Preble's habitat. Cattle use riparian zones and would trample these areas, reducing habitat available for these mice. However, the implementation of grazing systems, (including changes in season of use, distribution, kind and number of livestock) would incorporate Standards for Rangeland Health which would maintain or enhance riparian areas. For all range improvement projects, no surface disturbing activity will be allowed in identified or known breeding habitat between May 15 and August 15, or in identified hibernaculum between August 16 and May 14, to reduce disturbance to the mouse or its habitat.

The livestock management program *May Affect, but is not Likely to Adversely Affect (NL-b)* the Canada lynx. The development of water facilities (catchments, reservoirs, springs, pipelines, in-stream structures, and wells) would have a beneficial affect on lynx. Increased human activity during water facility construction operations could temporarily alter the lynx migration routes, however, off-channel water developments would provide water when and if lynx are moving between occupied habitats.

The livestock management program *May Affect, but is not Likely to Adversely Affect (NL-i and NL-d)* the bald eagle. The implementation and monitoring of grazing systems would result in improved rangeland health and would not generally disturb nesting and foraging eagles; there could be incidences of individual eagle disturbance from human presence. The construction, maintenance, modification fences and enclosures; and the development of water facilities would potentially result in disturbance to eagles. Maintenance on these projects may increase human disturbance near nests and/or wintering habitat. Supplemental feeding would be authorized on a case-by-case basis under emergency conditions only and would potentially disturb nesting or roosting eagles. All these impacts would be short term and minimal.

Changes in livestock management practices are approved on a case-by-case basis only when the change maintains or improves rangeland health, including riparian systems. Riparian exclosures would improve riparian health by removing negative affects from livestock grazing there by improving recruitment of new trees for potential nesting habitat. Timing stipulations for activities potentially affecting eagles would remove disturbances from these activities during critical time periods.

The livestock management program activities *May Affect, but are not Likely to Adversely Affect (NL-i and NL-d)* the Wyoming toad. Increased human activity during fence and exclosure construction operations could temporarily displace the Wyoming toad. Vehicle use during construction and maintenance activities may result in the loss of a Wyoming toad. Riparian exclosures would improve riparian health by removing negative affects from livestock grazing, thereby maintaining or enhancing Wyoming toad habitat. Additionally, indirect impacts to habitat could occur from the concentration of livestock in new areas, increasing disturbance in certain areas and reducing disturbance in others. The concentration of livestock (e.g. funneling of activity along fences) would result in degradation or loss of habitat including loss of cover, soil compaction, however, livestock conversions may affect Wyoming toad and their habitat based on the change in forage utilization that may potentially reduce amount of cover used by these species. Currently, in potential Wyoming toad habitat, there are no grazing authorizations for sheep. Cattle use riparian zones and would trample these areas, reducing habitat available for these toads. However, the implementation of grazing systems, (including changes in season of use, distribution, kind and number of livestock) would incorporate Standards for Rangeland Health which would maintain or enhance riparian areas. Supplemental feeding would be authorized on a case-by-case basis under emergency conditions only and would potentially disturb hibernating toads. All these impacts would be short term and minimal. Also, currently, there are no known toad populations located on BLM lands which further reduces the likelihood of these impacts occurring. Future reintroductions or expansions of toad populations may occur on BLM lands.

The development of water facilities (catchments, reservoirs, springs, pipelines, in-stream structures, and wells connected to the surface aquifer) within the livestock management program *May Affect, and Likely to Adversely Affect (LAA)* the Platte River and Colorado River species. Direct impacts may occur from water depletion associated with construction, development and operation of these activities and facilities. The increased water surface area of catchments and reservoirs will lead to increased evaporative loss of water thereby causing additional depletions to the systems.

Livestock conversions, livestock grazing authorizations, or implementing grazing systems within the livestock management program *May Affect, and are Likely to Adversely Affect (LAA)* the blowout penstemon plant. Livestock management activities generally benefit the habitat necessary for these plants if timed to occur up to one month prior to flowering. Livestock grazing may affect these plants by crushing or removing individual plants. A beneficial affect from livestock presence may occur due to sand dune disturbance from livestock movement which helps maintain habitat requirements for the plant. Conservation measures to protect this plant will include intensive management of livestock use during critical time periods to allow the plants to flower and set seed. Intensive management includes distance restrictions, seasonal or timing restrictions, rehabilitation standards, use of BMPs for grazing, and/or fencing. Cattle usually avoid these soft sand dune areas, but may step on and crush very few individual plants or consume them along with other forage as they move through these areas to better foraging sites. Also, the blowout penstemon is seldom grazed due to low palatability to cattle. Although individual plants may be damaged, and while the fitness of the plants may be affected for the season, the plants usually recover, and the overall population is minimally affected (Stubbendieck et al, 1997). Grazing is recognized as a beneficial activity that maintains the habitat for these plants (Fertig, 1999).

Construction of fences, exclosures, and water developments within the livestock management program *May Affect, but are not Likely to Adversely Affect (NL-i and NL-d)* the blowout penstemon. would be

intensively managed in occupied habitat. Vehicle use during construction activities may result in the loss of an individual plant. Additionally, indirect impacts to habitat could occur from the concentration of livestock (e.g. funneling of activity along fences) in new areas, increasing disturbance in certain areas and reducing disturbance in others. The penstemon requires early successional, disturbed habitat (shifting sand dunes), therefore increased sand dune disturbance from livestock use maintains and/or increases these conditions.

Livestock conversions, livestock grazing authorizations, or implementing grazing systems within the livestock management program *May Affect, and are Likely to Adversely Affect (LAA)* the Colorado butterfly and Ute ladies'-tresses plants. Livestock management activities generally benefit the habitat necessary for these plants if timed to occur up to one month prior to flowering. Livestock conversion or livestock grazing authorizations may affect these plants by crushing or removing individual plants. A beneficial affect from livestock use may occur due to clearing of dense vegetation which reduces or eliminates competition with other species. Conservation measures to protect these plants will include intensive management of livestock use during critical time periods to allow the plants to flower and set seed. Intensive management includes distance restrictions, seasonal or timing restrictions, rehabilitation standards, use of BMPs for grazing, and/or fencing. Livestock are attracted to riparian areas and may step on and crush very few individual plants or consume them along with other forage. Although individual plants may be damaged, and while the fitness of the plants may be affected for the season, the plants usually recover, and the overall population is minimally affected. Grazing is recognized as a beneficial activity that maintains the habitat for these plants.

Livestock management activities *May Affect, but are not Likely to Adversely Affect (NL-i and NL-d)* the Colorado butterfly plant and Ute ladies'-tresses plants. Construction of fences, exclosures, and water developments would be intensively managed in occupied habitat. Vehicle use during construction and maintenance activities may result in the loss of an individual plant. Riparian exclosures would improve riparian health by removing negative affects from livestock grazing, thereby maintaining or enhancing plant habitat habitat. Additionally, indirect impacts to habitat could occur from the concentration of livestock in new areas, increasing disturbance in certain areas and reducing disturbance in others. The concentration of livestock (e.g. funneling of activity along fences) would result in degradation or loss of habitat including loss of cover, soil compaction, however, livestock conversions may affect these plants and their habitat based on the change in forage species utilization. Also, currently, there are no known plant populations located on BLM lands which further reduces the likelihood of these impacts occurring.

The development of water facilities, primarily catchments and reservoirs, within the livestock management program *May Impact, but are not likely to contribute to the need for federal listing (MI)* of the Western yellow-billed cuckoo. These actions have the potential to flood habitat and alter stream flows required for cottonwood/willow re-establishment. Proposed projects will be designed and locations selected to minimize disturbances to habitat essential for the Western yellow-billed cuckoo. Surface-disturbing or disruptive activities will be prohibited within ½-mile of identified habitat during the period of April 15 to August 15 for the protection of nesting Western yellow-billed cuckoos. There have been no sightings of this bird, but there is potential habitat. These conservation measures would minimize any potential impact to the cuckoos or their habitat.

The development of water facilities, primarily catchments and reservoirs, within the livestock management program *May Impact, but are not likely to contribute to the need for federal listing (MI)* of the Western boreal toad. These actions have the potential to flood habitat. Proposed projects will be designed and locations selected to minimize disturbances to habitat essential for the Western boreal toad. For the protection of the western boreal toad and its identified habitat, surface-disturbing activities will be avoided in the following areas above 7500 feet: (a) identified 100-year flood plains; (b) areas within 500 feet from perennial waters, springs, wells, and wetlands; and (c) areas within 100 feet from the inner

gorge of ephemeral channels. There have been no recent sightings of this toad on BLM lands, but there is potential habitat. These conservation measures would minimize any potential impact to the toads or their habitat.

Minerals

Activity Description Summary

The minerals program is divided into three categories: salable minerals, leasable minerals, and locatable minerals.

Salable minerals include sand, gravel, sandstone, shale, limestone, dolomite, and other material considered a variety. Uses for these materials include road development and maintenance; building materials; decorative stone; and site reclamation which includes removing all man-made debris, re-contouring, reducing steep slopes, topsoil, and seeding and planting vegetation.

Leasable minerals include coal, oil, gas, and coalbed methane (bentonite is currently under reconsideration on BLM lands). Mineral exploration includes opening new areas to geophysical exploration; leasing; and potentially drilling for oil, gas, coalbed methane, and other leasable minerals. Mineral development includes expanding the exploration phase and constructing roads, pads, and other facilities; constructing above ground and buried pipelines; and reclamation activities.

Locatable minerals include bentonite, uranium, gypsum, silver, gold, platinum, cobalt, and other precious metals. Actions associated with the extraction of these materials include surface disturbance; construction of roads, buildings, and utility lines; and reclamation.

Surface disturbing and other activities associated with the minerals program include, but are not limited to, the following actions: apply dust control measures; restrict flaring of natural gas; control/limit emissions; construct and reclaim of well pads, access roads, and reserve pits; construct reservoirs associated with water disposal; construct compressor stations, product enhancement and disposal facilities; build pipelines associated with leases or units; install powerlines associated with leases or units; build wind power facilities and turbines associated with leases or units; develop coal reserves; explore for and develop locatable minerals (gold, silver, cobalt, etc.); mine for mineral materials (sand and gravel, decorative stone, aggregate); and conduct geophysical exploration (Table 7).

Impact Analysis and Effects Determination

Minerals program activities *May Affect, but are not Likely to Adversely Affect (NL-i and NL-d)* the black-footed ferret. The construction and reclamation of well pads, access roads and reserve pits; reservoirs associated with water disposal; and compressor stations, product enhancement and disposal facilities will displace black-footed ferrets by the increased human presence associated with these activities. These facilities provide raptor perches and nesting sites that may indirectly lead to increased predation of prairie dogs, affecting the prey base of ferrets. In general, pipeline, powerline, and windpower projects are not located within potential black-footed ferret habitat so there would be no direct impact to the ferret. Pipeline and powerline projects that are located within prairie dog towns would usually be buried and would potentially result in an inadvertent loss of a ferret. Pipeline construction results in disturbed soils (easier to dig in) which may attract prairie dogs and create additional habitat and subsequent prey base for the ferret. Windpower projects associated with oil production would be a minor occurrence, are located on high ridges or benches, and generally are not placed within existing prairie dog towns. Locatable mineral development rarely occurs within potential black-footed ferret habitat; therefore, impacts to this species would be insignificant. Geophysical projects may be located within potential habitat; these

projects would potentially damage the habitat (by driving over and collapsing burrows) or result in an incidental loss of a ferret (by crushing). Suitable prairie dog towns will be avoided if at all possible. If suitable prairie dog town/complex avoidance is not possible, surveys of towns/complexes for black-footed ferrets will be conducted in accordance with USFWS guidelines and requirements.

Minerals program activities *May Affect, but are not Likely to Adversely Affect (NL-i and NL-d)* the Preble's meadow jumping mouse and critical habitat. Leasable mineral development (well pads, water disposal reservoirs, and associated facilities) has the potential to disturb Preble's in upland habitats within 300 feet of the 100-year floodplain immediately adjacent to the riparian zones where these mice are thought to occur. However, the potential for leasable minerals to occur in potential Preble's habitat is very low and conservation measures would minimize disturbance to the mouse and the critical habitat. Locatable mineral exploration/development and mineral material extraction activities, and associated human presence within and adjacent to Preble's meadow jumping mouse habitat, may result in the loss of habitat and displacement of the local mouse population. Vehicle use associated with dust control measures and all minerals management activities has the potential to kill mice, although this is unlikely to occur. Geophysical projects may be located within potential habitat; these projects would potentially damage the habitat (by driving over) or result in an incidental loss of a mouse (by crushing). Surface-disturbing and disruptive activities will be intensively managed to maintain or enhance designated critical habitat for the Preble's meadow jumping mouse. Timing and distance restrictions will also be applied to identified habitat during the breeding season and hibernation to minimize disturbance during sensitive time periods. These conservation measures, combined with the minimal amount of identified critical habitat in the RFO would significantly reduce potential disturbance to Preble's mice and their habitat.

The control/limit of emissions; construction and initial reclamation of well pads, access roads, and reserve pits; compressor stations, product enhancement and disposal facilities; pipelines, powerlines, and wind power associated with leases or units; and locatable mineral exploration and development (gold, silver, cobalt, etc.); within the minerals management program *May Affect, but are not Likely to Adversely Affect (NL-d and NL-i)* the Canada lynx. These actions would have an insignificant affect on these species. These activities would be extremely unlikely to occur within lynx habitat due to the low potential of most mineral activity within riparian and spruce-fir habitat. Locatable mineral exploration would be more likely to occur; however, construction activities located within 500 ft of open water and/or 100 ft of intermittent or ephemeral channels in potential and/or known habitat for Canada lynx will be avoided. In potential lynx habitat (spruce/fir), the RFO biologists will conduct surveys (following established protocol), or assume species presence, for all likely affected T&E and Special Status species habitat, or potential habitat prior to authorizing surface disturbing activities. Proposed projects will be designed and locations selected to minimize disturbances to species and habitat and if avoidance is not possible, informal consultation with the USFWS will be initiated. With the implementation of these conservations measures and the low likelihood of these types of projects in potential lynx habitat, the impacts would be discountable and/or insignificant.

Reservoirs associated with water disposal within the minerals management program *May Affect, but are not Likely to Adversely Affect (NL-b)* the Canada lynx; these actions would have a beneficial affect on these species. Although these activities would be extremely unlikely to occur within spruce-fir and riparian habitat, due to the low potential of associated mineral activity within this area; if they were to occur, reservoirs would benefit this species by providing an additional water source.

Powerlines and wind power associated with leases or units within the minerals program *May Affect, and is Likely to Adversely Affect (LAA)* the bald eagle. This may cause short-term behavioral avoidance of these areas by the eagles. It may also result in the taking of eagles by vehicles during construction and/or use of the roads associated with these actions, as well as other human activities. To avoid collisions and electrocution of bald eagles, any power line construction will follow recommendations by the Avian

Power Line Interaction Committee (APLIC) (1994, 1996). Power lines will be placed underground and/or in locations necessary to avoid impacts to bald eagles on a case-by-case basis. Although conservation measures will be implemented, there is always the chance that an eagle could be electrocuted or collide with a line.

Construction and reclamation of well pads, access roads, and reserve pits; compressor stations, product enhancement and disposal facilities; locatable mineral exploration and development (gold, silver, cobalt, etc.); mineral material sales (sand and gravel, decorative stone, aggregate); and geophysical exploration within the minerals management program *May Affect, but are not Likely to Adversely Affect (NL-d and NL-i)* the bald eagle. These actions would have an insignificant and/or discountable affect on these species. Due to the limited extent of bald eagle habitat within the field office and implementation of the general conservation measure “Construction activities located within 500 ft of open water and/or 100 ft of intermittent or ephemeral channels in potential and/or known habitat for T&E and Special Status species will be avoided”, impacts to this species would be insignificant.

The construction and reclamation of well pads, access roads, and reserve pits; compressor stations, product enhancement and disposal facilities within the minerals management program *May Affect, but are not Likely to Adversely Affect (NL-i)* the Wyoming toad; these actions would have an insignificant affect on these species. There is a very low potential for mineral development within the very limited Wyoming toad habitats. Also, implementation of conservation measures would require projects to be relocated outside of toad habitat thereby reducing impacts to species and their habitat.

Reservoirs associated with water disposal within the minerals management program *May Affect, but are not Likely to Adversely Affect (NL-b)* the Wyoming toad; these actions would have a beneficial affect on these species. Although the potential for mineral development within this area is very low, if a reservoir were constructed, it would provide additional habitat for the toad and benefit these species.

Application of dust control measures; construction and initial reclamation of well pads, access roads, and reserve pits; pipelines associated with leases or units; and mineral material sales (sand and gravel, decorative stone, aggregate) within the minerals program *May Affect, and is Likely to Adversely Affect (LAA)* the Platte River and Colorado River species. In general, mineral development within the Platte or Colorado River systems does not allow for water depletion; however, some activities, such as dust control measures, may result in a depletion of water within these watersheds. Water depletion reduces minimum flows to down stream species, resulting in loss of habitat.

The application of dust control measures; pipelines associated with leases or units; and geophysical exploration within the minerals management program *May Affect, but are not Likely to Adversely Affect (NL-d and NL-i)* the blowout penstemon plant; these actions would have an insignificant affect on these species. The application of dust control measures is highly unlikely to occur within sand dunes; therefore, the affect of this action on the blowout penstemon is insignificant. Constructing pipelines and permitting geophysical projects have the potential to occur within potential habitat; however, conservation measures, such as “Known habitat for the blowout penstemon plant will be open to oil and gas leasing with a NSO stipulation” and intensive management within identified populations, would be applied to these actions to maintain or enhance habitat for the plant.

Construction and initial reclamation of well pads, access roads, and reserve pits; the application of dust control measures; reservoirs associated with water disposal; compressor stations, product enhancement and disposal facilities; pipelines associated with leases or units; locatable mineral exploration and development (gold, silver, cobalt, etc.); mineral material sales (sand and gravel, decorative stone, aggregate); and geophysical exploration, powerlines associated with leases or units within the minerals management program *May Affect, but are Not Likely to Adversely Affect (NL-d)* the Colorado butterfly

plant and Ute ladies'-tresses plant; these actions would have a discountable affect on these species. These actions would be extremely unlikely to occur within the species habitat due to the low potential of mineral activity within these riparian habitats. In addition, if mineral activity were to occur, surface disturbing activities would unlikely to be authorized within 500 feet of riparian areas which would protect the habitat for the plants.

Off-Highway Vehicle Use

Activity Description Summary

Designate and implement closed, limited, and open areas for OHV use, post signs, permit OHV events, allow use of motorized over-the-snow vehicles (snowmobiles).

Surface disturbing and other activities associated with the OHV program include, but are not limited to, the following actions: 1) Designate, implement, and monitor closed area for OHV use, 2) designate, implement, and monitor limited areas for OHV use, 3) designate, implement, and monitor open areas for OHV use, 4) post signs, maps, and brochures, 5) allow use of motorized over-the-snow vehicles.

Impact Analysis and Effects Determination

Human presence within these habitat types may affect these species by surface disturbing activities, snow compaction which alters habitat, associated snow mobile activity and increased human activity, leading to behavioral avoidance and stress to individual animals.

The designation and implementation of closed and limited areas for OHV use and allowing the use of motorized over-the-snow vehicles within the OHV use program *May Affect, but are not Likely to Adversely Affect (NL-d)* the black-footed ferret. These actions would have a discountable affect on the species. Closing and designating limited areas would reduce disturbance to potential black-footed ferret habitat since OHV use would be restricted to designated routes. In addition, where two tracks traverse prairie dog towns, there is the potential for a black-footed ferret to be hit. However, this is highly unlikely due to the nature of the ferret and its nocturnal behavior. The use of over-the-snow vehicles has the potential to occur in black-footed ferret habitat, however, it is highly unlikely that this would result in the loss of a ferret because generally use occurs during the daylight hours when ferrets are below ground.

The designation and implementation of closed and limited areas for OHV use within the OHV use program *May Affect, but is not Likely to Adversely Affect (NL-d)* the Preble's meadow jumping mouse and its critical habitat. Closing and designating limited areas would reduce disturbance to potential mouse habitat since OHV use would be restricted to designated routes. In addition, where two tracks traverse mouse habitat, there is the potential for a mouse to be killed. Although this may occur, it is highly unlikely for this to take place.

The designation and implementation of closed and limited areas for OHV use and allowing the use of motorized over-the-snow vehicles within the OHV use program *May Affect, but are not Likely to Adversely Affect (NL-d)* the Canada lynx. These actions would have a discountable affect on the species. Closing and designating limited areas would reduce disturbance to Canada lynx travel corridors since OHV use would be restricted to designated routes. In addition, where two tracks traverse lynx travel corridors, there is the potential for a lynx to be hit. However, this is highly unlikely due to the secretive nature of the lynx and its rarity on BLM administered lands. The use of over-the-snow vehicles has the potential to occur in Canada lynx travel corridors, and human presence within these habitat types may affect these species by increased activity. This would lead to behavioral avoidance and stress to individual animals; however, it is highly unlikely that this would result in the loss of a lynx because of

lynx rarity. In allowing these activities, it is very unlikely that a lynx would be encountered due to their nature; therefore, impacts to this species as a result of implementing these actions are discountable.

The designation and implementation of closed and limited areas for OHV use and allowing the use of motorized over-the-snow vehicles within the OHV use program *May Affect, but are not Likely to Adversely Affect (NL-i)* the bald eagle. These actions would have an immeasurable affect on the species. Closing and designating limited areas would reduce disturbance to bald eagle nesting and communal/winter roost sites since OHV use would be restricted to designated routes. In addition, where two tracks are located adjacent to nests and communal/winter roost sites, there is the potential for an eagle to be disturbed. The use of over-the-snow vehicles has the potential to occur in bald eagle habitat and it is likely that this would result in disturbance of an eagle. In both of these cases, the disturbance would be short-term and the eagle would return.

The designation and implementation of closed and limited areas for OHV use within the OHV use program *May Affect, but is not Likely to Adversely Affect (NL-d)* the Wyoming toad. Closing and designating limited areas would reduce disturbance to potential toad habitat since OHV use would be restricted to designated routes. In addition, where two tracks are adjacent to toad habitat, there is the potential for a toad to be killed. Although this may occur, it is highly unlikely for this to take place; therefore, impacts to the Wyoming toad would be discountable.

The designation and implementation of closed, limited, and open areas for OHV use within the OHV use program *May Affect, but are not Likely to Adversely Affect (NL-d)* the blowout penstemon. Closing and designating limited areas would reduce disturbance to penstemon populations since OHV use would be restricted to designated routes. Currently, the only open area is the Dune Ponds Area where no population currently exists. However, this is still potential habitat and if, at some future date, this area supported a population, it would then be designated an ACEC and the OHV designation would be changed. This would reduce the impact to discountable.

The designation and implementation of closed and limited areas for OHV use and allow use of motorized over-the-snow vehicles within the OHV use program *May Affect, but are not Likely to Adversely Affect (NL-d)* the Colorado butterfly plant and the Ute ladies'-tresses plant. Closing and designating limited areas would reduce disturbance to potential plant habitat since OHV use would be restricted to designated routes.

Paleontology

Activity Description Summary

The paleontology program includes a variety of activities to preserve, protect, and restore paleontological resources. During inventories, the BLM inventories, categorizes, and preserves resources; conducts field activities; performs excavations; maps and collects surface materials; researches records; photographs sites and paleontological resources; uses hand tools, power tools, and heavy machinery. Management activities include managing sites for scientific and public uses; developing interpretive sites; implementing land use restrictions; closing areas to surface disturbing activities; preparing interpretive materials; collecting fossils; pursuing withdrawals; designating avoidance areas; and pursuing cooperative agreements.

Surface disturbing and other activities associated with the paleontology program include, but are not limited to, the following actions: 1) surface disturbing activities to collect specimens (hand tools, power tools, heavy machinery); 2) allow collection of invertebrate fossils; 3) inventory paleontological resources; 4) develop interpretive sites; and 5) stabilize erosion (bury exposed sites) (Table 7).

Impact Analysis and Effects Determination

Surface disturbing activities to collect specimens (hand tools, power tools, heavy machinery), the collection of invertebrate fossils, inventory of paleontological resources, and stabilizing erosion (bury exposed sites) within the paleontology management program *May Affect, but are not Likely to Adversely Affect (NL-i)* the Preble's meadow jumping mouse and critical habitat. These actions would have an insignificant affect on these species. It is unlikely that the sites conducive for finding paleontological resources would correspond to habitat for Preble's meadow jumping mouse; therefore, impacts to this species as a result of implementing these actions would be insignificant. Surface-disturbing and disruptive activities will be intensively managed to maintain or enhance habitat for the Preble's meadow jumping mouse. Intensive management includes the use of inventory, proper distance restrictions, and seasonal or timing restrictions.

Surface disturbing activities to collect specimens (hand tools, power tools, heavy machinery), the collection of invertebrate fossils, inventory of paleontological resources, and stabilize erosion (bury exposed sites) within the paleontology management program *May Affect, but are not Likely to Adversely Affect (NL-i)* the Canada lynx. These actions would have an insignificant affect on the species. It is unlikely that the sites conducive for finding paleontological resources would correspond to habitat for the Canada lynx. Therefore, impacts to the species as a result of implementing these actions would be insignificant.

Surface disturbing activities to collect specimens (hand tools, power tools, heavy machinery), the collection of invertebrate fossils, inventory of paleontological resources, and stabilize erosion (bury exposed sites) within the paleontology management program *May Affect, but are not Likely to Adversely Affect (NL-i)* the bald eagle. These actions would have an insignificant affect on the species. It is unlikely that the sites conducive for finding paleontological resources would correspond to the nesting and roosting habitat for bald eagles. Conservation measures including the use of inventory, proper distance restrictions, and seasonal or timing restrictions would be implemented. Therefore, impacts to the species as a result of implementing these actions would be insignificant.

Recreation Resources

Activity Description Summary

Recreation management activities include allowing and improving recreation access, building and maintaining developed recreation sites, ensuring public safety, protecting the resources, assessing recreation use, managing recreation activities on BLM lands (hiking, hunting, biking, floating, fishing, OHV use, horseback riding, backpacking, rock hounding, camping, large recreation events), recreation site development (facilities), monitoring OHV use, contacting visitors in the field, places signs, identifies hazards, restricts recreation use, conducts inventories of recreation use, monitors recreation use, develops management plans, and evaluates recreation potential.

Surface disturbing and other activities associated with the recreation resources program include, but are not limited to, the following actions: 1) restrict recreational use, 2) permit competitive recreation events, 3) develop recreational trails, 4) construct recreation sites, 5) maintain developed and undeveloped recreation sites (campgrounds), 6) place boundary signs and interpretive markers, 7) commercial recreation uses, and 8) develop public water sources for recreation facilities. (Table 7).

Impact Analysis and Effects Determination

Permitting competitive recreation events, commercial recreation uses, and developing public water sources for recreation within the recreation resources program *May Affect, but are not Likely to Adversely*

Affect (NL-d/NL-i) the black-footed ferret. Commercial recreation (outfitters) that may take place near prairie dog towns and other ferret habitat may displace black-footed ferrets through behavioral avoidance associated with the presence of humans and their associated activities. Developing public water sources in general, would not occur within prairie dog towns. If this were to occur, it would not be in prairie dog towns that qualify as black-footed ferret habitat. In addition, prairie dogs do move and have the potential into areas prior to the development of the project. If this occurs the project will be moved or a black-footed ferret survey will be completed. Permitting competitive events would have a discountable affect on these species. These activities would not be permitted within potential black-footed ferret habitat and participants are required to remain on designated roads and trails; however, there is the possibility that people may leave the roads and trails and disturb ferrets if present.

Restricting recreational use within the recreation resources program *May Affect, but is not Likely to Adversely Affect (NL-b)* the black-footed ferret since the BLM would restrict use within existing black-footed ferret habitat which would protect this species.

Permitting competitive recreation events, and commercial recreation uses within the recreation resources program *May Affect, but are not Likely to Adversely Affect (NL-d)* the Preble's meadow jumping mouse and critical habitat. However, surface-disturbing and disruptive activities will be intensively managed to maintain or enhance identified potential (within 300 feet of the identified 100-year floodplain) or known habitat for the Preble's meadow jumping mouse. Intensive management may vary from year to year and includes the use of inventory, proper distance restrictions, and seasonal or timing restrictions. Therefore, these activities would have an immeasurable impact on Preble's meadow jumping mice as a result of trampling of riparian and upland vegetation associated with their critical habitats.

Restricting recreational use within the recreation resources program *May Affect, but is not Likely to Adversely Affect (NL-b)* the Preble's meadow jumping mouse since the BLM would restrict use within riparian habitat which would protect this species.

Commercial recreation uses within the recreation resources program *May Affect, but are not Likely to Adversely Affect (NL-i)* the Canada lynx. This actions would have an insignificant affect on these species. The vast majority of BLM lands are not forested and do not contain suitable lynx habitat; therefore, impacts to these species as a result of authorizing recreational activities on BLM-administered lands would be insignificant.

Restricting recreational use within the recreation resources program *May Affect, but is not Likely to Adversely Affect (NL-b)* the Canada lynx since restrictions within riparian corridors would protect this species.

Construct recreation sites, maintain developed and undeveloped recreation sites (campgrounds), and commercial recreation uses within the recreation resources program *Affect, but is not Likely to Adversely Affect (NL-d)* the bald eagle. During construction, the use of inventory, proper distance restrictions (NSO for nests and winter communal roosts), and seasonal or timing restrictions would restrict disturbance to eagles during critical time periods. Recreational activities that occur as a result of these projects, such as camping and maintenance of recreational sites, may lead to the avoidance of roosting and nesting eagles due to increased human activity.

Restricting recreational use within the recreation resources program *May Affect, but is not Likely to Adversely Affect (NL-b)* the bald eagle since restrictions within riparian corridors would protect this species.

Commercial recreation uses within the recreation resources program *May Affect, but is not Likely to Adversely Affect (NL-d)* the Wyoming toad. This activity may lead to the increased human use causing trampling of toad habitat and accidental loss of toads. The habitat for this species is very limited and it is highly unlikely to occur.

Restricting recreational use within the recreation resources program *May Affect, but is not Likely to Adversely Affect (NL-b)* the Wyoming toad. This action would have a beneficial affect on this species since restrictions within riparian corridors would protect this species.

Permitting competitive recreation events and placing boundary signs and interpretive markers within the recreation resources program *May Affect but is not Likely to Adversely Affect (NL-d /NL-i)* the blowout penstemon plant. These actions would have an insignificant affect on the species. These activities usually do not occur within sand dunes with blowouts; therefore, impacts to the plant would be insignificant. Competitive events are usually restricted to designated roads and would not occur within the sand dune areas where the plants are located; therefore, impacts to the plant would be discountable.

Restricting recreational use within the recreation resources program *May Affect, but is not Likely to Adversely Affect (NL-b)* the blowout penstemon plant. This action would have a beneficial affect on the species since restrictions within sand dunes would protect this species.

Commercial recreation uses within the recreation resources program *May Affect, but is not Likely to Adversely Affect (NL-d)* the Colorado butterfly plant and Critical habitat and Ute ladies'-tresses plant. Commercial users may lead to trampling and soil compaction of plant habitat, accidental taking of plants and loss of useable habitat through campsite development. This use is relatively light and dispersed; therefore impacts to these plants would be discountable.

Restricting recreational use within the recreation resources program *May Affect, but is not Likely to Adversely Affect (NL-b)* the Colorado butterfly plant and critical habitat, and the Ute ladies'-tresses plant. This action would have a beneficial affect on these species since restrictions within riparian corridors would protect these species.

Special Management Areas

Activity Description Summary

The Special Management Areas program includes Special Recreation Management Areas, Wild and Scenic River management, and Wilderness management. The BLM implements closures and restrictions to protect the resources found within these areas.

Authorization of the special management areas program include management within the following areas: Adobe Town WSA, Prospect Mountain WSA, Encampment River Canyon WSA, Ferris Mountains WSA, Bennett Mountains WSA, Sandhills ACEC/Proposed JO Ranch Expansion, Jep Canyon Wildlife Habitat Management Area, Shamrock Hills Wildlife Habitat Management Area, Laramie Plains Lakes Wildlife Habitat Management Area, Blowout Penstemon ACEC, Continental Divide National Scenic Trail SRMA, and North Platte River SRMA. (Table 7).

Impact Analysis and Effects Determination

Adobe Town WSA (continue present management), Sandhills ACEC/Proposed JO Ranch Expansion, Jep Canyon Wildlife Habitat Management Area, and Shamrock Hills Wildlife Habitat Management within the SMA program *May Affect, but are not Likely to Adversely Affect (NL-b)* the black-footed ferret. These SMAs would be managed for wildlife species conservation and would have a beneficial affect on black-

footed ferrets. Individual plans will be implemented for each area and specific protection measures will be applied.

Adobe Town WSA (continue present management), Prospect Mountain WSA, Encampment River Canyon WSA (continue present management), Ferris Mountain WSA, Bennett Mountains WSA, Sandhills ACEC/Proposed JO Ranch Expansion, Jep Canyon Wildlife Habitat Management Area within the SMA program *May Affect, but are not Likely to Adversely Affect (NL-b)* the Canada lynx. These SMAs would be managed for wildlife species conservation and would have a beneficial affect on lynx travel corridors. Individual plans will be implemented for each area and specific protection measures will be applied.

Prospect Mountain WSA, Encampment River Canyon WSA (continue present management), Ferris Mountain WSA, Bennett Mountains WSA, Sandhills ACEC/Proposed JO Ranch Expansion, and North Platte River SRMA within the SMA program *May Affect, but is not Likely to Adversely Affect (NL-b)* the bald eagle. These SMAs would be managed for wildlife species conservation and would have a beneficial affect eagles. Individual plans will be implemented for each area and specific protection measures will be applied.

Laramie Plains Lakes Wildlife Habitat Management Area within the SMA program *May Affect, but is not Likely to Adversely Affect (NL-b)* the Wyoming toad. These SMAs would be managed for wildlife species conservation and would have a beneficial affect on the Wyoming toad. Individual plans will be implemented for each area and specific protection measures will be applied.

The Blowout Penstemon ACEC within the SMA program *May Affect, but is not Likely to Adversely Affect (NL-b)* the blowout penstemon plant. This SMA would be managed for wildlife species conservation and would have a beneficial affect on the plant. Individual plans will be implemented for each area and specific protection measures will be applied.

The Laramie Plains Lakes Wildlife Habitat Management Area within the SMA program *May Affect, but is not Likely to Adversely Affect (NL-b)* the Colorado butterfly plant and Critical habitat. This SMA would be managed for wildlife species conservation and would have a beneficial affect on the plant. Individual plans will be implemented for each area and specific protection measures will be applied.

Prospect Mountain WSA, Encampment River Canyon WSA (continue present management), Ferris Mountain WSA, Bennett Mountains WSA, Sandhills ACEC/Proposed JO Ranch Expansion, Jep Canyon Wildlife Habitat Management Area, Shamrock Hills Wildlife Habitat Management Area, Laramie Plains Lakes Wildlife Habitat Management Area, Blowout Penstemon ACEC, and North Platte River SRMA within the SMA program *May Affect, but is not Likely to Adversely Affect (NL-b)* the Ute ladies'-tresses plant. These SMAs would be managed for wildlife species conservation and would have a beneficial affect on the plant. Individual plans will be implemented for each area and specific protection measures will be applied.

Transportation and Access Management

Activity Description Summary

The Transportation and Access Management program and associated activities is generally in support of other resource management programs. The BLM rehabilitates access roads no longer needed, proposes access easement acquisitions, and pursues legal access across private and state lands.

Surface disturbing and other activities associated with the transportation and access management program include, but are not limited to, the following actions: acquire access easements (Table 7).

Impact Analysis and Effects Determination

Acquisition of access easements within the transportation and access management program *May Affect, but is not Likely to Adversely Affect (NL-d)* the black-footed ferret. Acquisition of access easements that will traverse potential black-footed ferret habitat (i.e. prairie dog towns), may cause a loss of a ferret from collisions with vehicles and an indirect disturbance from human activities. Due to the nocturnal behavior of ferrets, the chance of this is highly unlikely. Acquisition of access easements will open new areas to the public that may expose black-footed ferret habitat (prairie dog towns) to additional use. This may increase the “target shooting” of prairie dogs in these new areas, which would reduce the prey source for black-footed ferret and reduce the overall quality of their habitat. Overall, shooting has not been shown to have a negative impact to the prey base.

Acquisition of access easements within the transportation and access management program *May Affect, but is not Likely to Adversely Affect (NL-d)* the Preble’s meadow jumping mouse and critical habitat. Acquisition of access easements that traverse potential Preble’s meadow jumping mouse and their critical habitat, may cause the loss of a mouse from vehicles and an indirect disturbance from human activities.

Acquisition of access easements within the transportation and access management program *May Affect, but is not Likely to Adversely Affect (NL-i)* the Canada lynx. Although easements increase public access and there is a slight possibility of disturbance to a lynx within travel corridors; this action would have an insignificant affect on this species due to its secretive nature.

Acquisition of access easements within the transportation and access management program *May Affect, but is not Likely to Adversely Affect (NL-i)* the bald eagle. Although easements increase public access and there is a slight possibility of disturbance to an eagle, this action would be short-term, and birds should return.

Acquisition of access easements within the transportation and access management program *May Affect, but is not Likely to Adversely Affect (NL-d)* the Wyoming toad. Acquisition of access easements that traverse potential toad habitat, may cause the loss of a toad from vehicles and an indirect disturbance from human activities.

Acquisition of access easements within the transportation and access management program *May Affect, but is not Likely to Adversely Affect (NL-d)* the blowout penstemon plant, Colorado butterfly plant and critical habitat, and Ute ladies’-tresses plant. Acquisition of access easements that traverse potential plant habitat, may cause the loss of a plant from vehicles.

Vegetation Management

Activity Description Summary

Maintain or improve the diversity of plant communities to support multiple use for such programs as livestock management, wildlife habitat management, forestry management, watershed management and visual resources management. In addition, the vegetation management program works to control the spread of weeds and the protection of important habitats for special status plants species.

Surface disturbing and other activities associated with the vegetation program (including noxious and invasive weed control) include, but are not limited to, the following actions: 1) implement planting and seeding, 2) use biological controls including species-specific insects and livestock grazing, 3) use of light

mechanical control, including cutting and thinning with hand tools, 4) use of heavy mechanical control, including brush beating, cutting, and thinning with machinery and 5) use chemical control (including aerial).

Impact Analysis and Effects Determination

The implementation of planting and seeding, the use of biological controls (including species-specific insects and livestock grazing), the use of light mechanical control, (including cutting and thinning with hand tools), the use of heavy mechanical control, (including brush beating, cutting, and thinning with machinery), and the use of chemical control (including aerial spraying) within the vegetation program *May Affect, but is not Likely to Adversely Affect (NL-d/NL-i)* the black-footed ferret. These activities within or adjacent to white-tailed and black-tailed prairie dog towns could impact a black-footed ferret. However, if prairie dog towns/complexes suitable as black-footed ferret habitat are present at the proposed project level, attempts will be made to locate all project components at least 50 m (up to 200 meters pursuant to FLPMA) from these towns/complexes to avoid direct impact to towns. All white-tailed prairie dog towns/complexes greater than 200 acres in size and black-tailed prairie dog towns/complexes greater than 80 acres will be avoided. If avoidance is not possible, these areas will be assessed and mapped at the proposed project level. Associated burrow densities of potentially affected towns will be determined, and when habitat is present, a black-footed ferret survey will be conducted, pursuant to Service & Bureau approved techniques.

The use of biological controls (including species-specific insects and livestock grazing) within the vegetation management program *May Affect, but is not Likely to Adversely Affect (NL-d)* the Preble's meadow jumping mouse and its critical habitat. Use of biological controls, including species-specific insects and livestock grazing, within Preble's meadow jumping mouse habitat and their critical habitat, may have a discountable impact from the loss of a mouse or the removing of forage and cover required for the mouse.

Implementing planting and seeding of sites within the vegetation management program *May Affect, but is not Likely to Adversely Affect (NL-b)* the Preble's meadow jumping mouse and its critical habitat. These activities will be intensively managed to maintain or enhance identified potential (within 300 feet of the identified 100-year floodplain) or known habitat for the Preble's meadow jumping mouse. Intensive management may vary from year to year and includes the use of inventory, proper distance restrictions, and seasonal or timing restrictions. In general these actions would improve habitat for the species.

Implement planting and seeding, the use of light mechanical control (including cutting and thinning with hand tools), the use of heavy mechanical control (including brush beating, cutting, thinning), and the use of chemical control (including aerial spraying) within the vegetation management program *May Affect, but are not Likely to Adversely Affect (NL-i)* the Canada lynx. These actions would have an insignificant affect on lynx using travel corridors, due to the secretive nature of the species. Noise and human activity associated with these activities are short-term in nature.

The use of biological controls (including species-specific insects and livestock grazing), the use of light mechanical control (including cutting, thinning with hand tools), and the use of heavy mechanical control (including brush beating, cutting, and thinning with machinery), and the use of chemical control (including aerial spraying) within the vegetation management program *May Affect, but is not Likely to Adversely Affect (NL-i)* the bald eagle. These actions would have an insignificant affect on these species. Noise and human activity associated with these activities are short-term in nature. During these activities the use of inventory, proper distance restrictions (NSO for nests and winter communal roosts), and seasonal or timing restrictions would reduce disturbance to eagles during critical time periods.

Implement planting and seeding within the vegetation management program *May Affect, but are not Likely to Adversely Affect (NL-b)* the bald eagle. This action would have a beneficial affect on these species by improving future nesting habitat with the planting of vegetation. During these activities the use of inventory, proper distance restrictions (NSO for nests and winter communal roosts), and seasonal or timing restrictions would reduce disturbance to eagles during critical time periods.

The use of biological controls (including species-specific insects and livestock grazing), the use of light mechanical control (including cutting, thinning with hand tools), and the use of heavy mechanical control (including brush beating, cutting, and thinning with machinery) within the vegetation management program *May Affect, but is not Likely to Adversely Affect (NL-i/NL-d)* the Wyoming toad. Mechanical control may alter the toads' habitat by reducing hiding cover temporarily. The reduction of noxious and invasive weeds within the area of disturbance would in the long-term improve toad habitat. Equipment activity and the use of livestock as a biological control would displace or potentially cause the loss of a toad.

The use of light mechanical control (including cutting and thinning with hand tools) within the vegetation management program *May Impact, but is not likely to contribute to the need for federal listing (MI)* of the Western boreal toad. Proposed projects will be designed and locations selected to minimize disturbances to habitat essential for the Western boreal toad. For the protection of the western boreal toad and its identified habitat, surface-disturbing activities will be avoided in the following areas above 7500 feet: (a) identified 100-year flood plains; (b) areas within 500 feet from perennial waters, springs, wells, and wetlands; and (c) areas within 100 feet from the inner gorge of ephemeral channels. There have been no recent sightings of this toad on BLM lands, but there is potential habitat. These conservation measures would minimize any potential impact to the toads or their habitat.

Implement planting and seeding, use biological controls (including species-specific insects, and livestock grazing) within the vegetation management program *May Affect, but are not Likely to Adversely Affect (NL-i)* the blowout penstemon. These actions are highly unlikely to occur in sand dune habitat and as such would have an insignificant affect on these species. Intensive management, including the use of proper distance and timing restrictions would reduce impacts during the reproductive time period for the plant. Insects used in biological control are genera specific and would not affect this species since this genera is different than known weed species.

The implementation of planting and seeding, the use of biological controls (including species-specific insects, livestock grazing), and the use of light mechanical control (including cutting, thinning with hand tools) within the vegetation management program *May Affect, but are not Likely to Adversely Affect (NL-i/NL-d)* the Colorado butterfly plant and Critical habitat, and Ute Ladies'-tresses. Planting and seeding along riparian habitats would possibly lead to direct loss of the species through trampling from increased human activity or may lead to indirect loss from increased competition from other plant species. This is highly unlikely because the area would be surveyed prior to project implementation in potential habitat. The use of light mechanical control within riparian habitats of where either Colorado butterfly plant or Ute ladies'-tresses may occur and would possibly lead to loss of the species though surface disturbing activities. The use of biological controls would possibly lead to direct loss or injury to a plant, through trampling or consumption from livestock and from increased human activity. Insects used in biological control are genera specific and would not affect these species since these genera are different than known weed species.

Visual

Activity Description Summary

The BLM maintains or improves scenic values and visual quality, establishes visual resource management priorities in conjunction with other resource values, completes visual resource inventories and classification processes.

Activities associated with the visual program require facilities to blend with the natural environment (Table 7).

Impact Analysis and Effects Determination

Requiring facilities to blend with the natural environment (using colors which blend with the background and topographic screening to reduce visual impacts) within the visual management program would have no effect, no jeopardy, or no impact to any of the species listed in this BA.

Water Quality, Watershed, and Soils Management

Activity Description Summary

The BLM performs a variety of activities designed to preserve and protect soil, water, and watershed quality. Some of these activities are implementation of watershed plans, identification of heavy sediment loads, monitoring and minimizing soil erosion, evaluating and restricting surface development activities, and monitoring water quality. These activities at times involve field activities and the use of heavy equipment and hand tools.

Through water resource management the BLM seeks to maintain or improve surface and groundwater quality consistent with existing and anticipated uses and applicable state and federal water quality standards, provide for the availability of water to facilitate authorized uses, and to minimize harmful consequences of erosion and surface runoff. Water resources are also to be protected or enhanced through site-specific mitigation guidelines.

During watershed management activities, the BLM develops pollution prevention plans, ensures water rights are filed for water-related projects, designs activities to reduce channel erosion, and restores damaged wetlands or riparian areas. The BLM also provides technical expertise on other activities such as livestock ponds, waterfowl monitoring activities, and provides impact analyses of oil and gas development or any surface disturbance projects. The BLM provides technical expertise in reestablishing floodplains or other disturbed sites.

Surface disturbing and other activities associated with the Water Quality, Watershed and Soils Management program include, but are not limited to, the following actions: 1) Allow for surface discharges of produced water; 2) Restrict surface disturbance near water resources and sensitive soils; 3) Limit surface disturbance and prohibit new permanent structures in the Encampment River watershed; 4) Close areas, including roads, where accelerated erosion is occurring; 5) Install stream crossings for appropriate sediment and flow passage (culverts, bridges); 6) Develop riparian/wetland exclosures; 7) Channel restoration using heavy equipment; and 8) Cutting, planting, and seeding to restore function in riparian/wetland areas.

Impact Analysis and Effects Determination

Closing areas, including roads, where accelerated erosion is occurring, within the Water Quality, Watershed and Soils Management program *May Affect, but are not Likely to Adversely Affect (NL-b)* the black-footed ferret. This activity will reduce human presence and allow for habitat restoration in areas of accelerated erosion.

Channel restoration using heavy equipment within the Water Quality, Watershed and Soils Management program *May Affect, and is Likely to Adversely Affect (LAA)* the Preble's meadow jumping mouse and its Critical Habitat. The use of motorized equipment and human activity associated with this surface disturbing activity may affect Preble's meadow jumping mice during construction activities and indirectly by modifying their critical riparian habitats and may result in the occasional loss of a mouse.

Allowing surface discharge of produced water from oil and gas activities, installing stream crossings for appropriate sediment and flow passage (culverts, bridges), and developing riparian/wetland enclosures within the Water Quality, Watershed and Soils Management program *May Affect, and is Not Likely to Adversely Affect (NL-i, NL-d)* the Preble's meadow jumping mouse. Where discharges take place in conjunction with Preble's habitat it could affect the vegetation and function of riparian systems where Preble's occur. Depending on the method of surface discharge, small streams or creeks would most likely receive impacts, however habitat along larger rivers such as the Laramie would not be impacted. These impacts would be channel readjustment which could make banks unstable and would result in temporary loss of riparian plants in these locations. If water tables are raised with channel stability, the overall health of riparian systems could be improved in some locations. Surface discharge in some cases will change the local hydrologic condition, but impacts to the species and habitat will be considered when determining discharge locations. The remaining activities improve the health and function of riparian habitat in the long-term. In the short-term, there may be light impacts to this species from human activity and construction; however, surface-disturbing and disruptive activities will be intensively managed to maintain or enhance identified potential (within 300 feet of the identified 100-year floodplain) or known habitat for the Preble's meadow jumping mouse. Intensive management may vary from year to year and includes the use of inventory, proper distance restrictions, and seasonal or timing restrictions.

Restrict surface disturbance near water resources in sensitive soils, close areas, including roads, where accelerated erosion is occurring, and cutting, planting, and seeding to restore function in riparian/wetland areas within the Water Quality, Watershed and Soils Management program *May Affect, and is Not Likely to Adversely Affect (NL-b)* the Preble's meadow jumping mouse and its Critical Habitat. These activities will improve the habitat for this species in the long-term and will reduce disturbance to the animals and their habitat.

Installing stream crossings for appropriate sediment and flow passage (culverts, bridges), channel restoration using heavy equipment, and cutting, planting, and seeding to restore function in riparian/wetland areas within the Water Quality, Watershed and Soils Management program *May Affect, but are not Likely to Adversely Affect (NL-i)* the Canada lynx. These actions would have a insignificant affect on these species. These activities could result in temporary displacement of Canada lynx using riparian areas as travel corridors.

The restrict surface disturbance near water resources and sensitive soils, limit surface disturbance and prohibit new permanent structures in the Encampment River watershed, and close areas, including roads, where accelerated erosion is occurring within the Water Quality, Watershed and Soils Management program *May Affect, but are not Likely to Adversely Affect (NL-b)* the Canada lynx. These actions would have a beneficial affect on these species. Most of these actions improve habitat used as travel corridors or for hunting where they occur in high elevations suitable for Canada lynx.

The allow for surface discharge of produced water, and develop riparian/wetland exclosures within the Water Quality, Watershed and Soils Management program *May Affect, but are not Likely to Adversely Affect (NL-i)* the bald eagle. In some cases the discharge of water would provide additional flow to surface waters and could improve the health of some riparian systems. The development of riparian/wetland exclosures could have surface disturbing impacts in riparian areas in the short-term however long-term impacts would improve the habitat for bald eagles. During construction, the use of inventory, proper distance restrictions (NSO for nests and winter communal roosts), and seasonal or timing restrictions would restrict disturbance to eagles during critical time periods.

The restriction of surface disturbance near water resources and sensitive soils; limiting surface disturbance and prohibiting new permanent structures in the Encampment River watershed; closing areas, including roads, where accelerated erosion is occurring; installing stream crossings for appropriate sediment and flow passage (culverts, bridges); channel restoration using heavy equipment; and cutting, planting, and seeding to restore function in riparian/wetland areas within the Water Quality, Watershed and Soils Management program, *May Affect, but are not Likely to Adversely Affect (NL-b)* the bald eagle. These actions would have a beneficial affect on these species. During construction, the use of inventory, proper distance restrictions (NSO for nests and winter communal roosts), and seasonal or timing restrictions would restrict disturbance to eagles during critical time periods. These actions would improve the physical conditions and water quality in areas where they occur and therefore would generally be beneficial for bald eagle habitat.

Channel restoration using heavy equipment within the water quality, watershed and soils management program *May Impact, but is not likely to contribute to the need for federal listing (MI)* of the Western yellow-billed cuckoo. Impacts would largely be concentrated in the channel; however where restoration activities occur, there could be some impacts to the uplands adjacent to the stream. There could be some habitat loss from inundation to cottonwood/willow communities and surface disturbance if these projects occurred within habitat used by the Western yellow-billed cuckoo. There could be potential new habitat created by increasing the water table in some areas making it more suitable for willow establishment.

Installing stream crossings for appropriate sediment and flow passage (culverts, bridges); developing riparian/wetland exclosures; and channel restoration using heavy equipment within the Water Quality, Watershed and Soils Management program *May Affect, but are not Likely to Adversely Affect (NL-i/NL-d)* the Wyoming toad. The identified habitat for this species is in the Laramie Plains Lakes and, if projects did occur in these areas there could be impacts to the habitat and potential loss of a toad. These activities would be designed to improve the hydrologic condition of these sites and therefore would have long-term beneficial affects that would make the overall impact insignificant.

Restricting surface disturbance near water resources and sensitive soils; and closing areas, including roads, where accelerated erosion is occurring within the Water Quality, Watershed and Soils Management program *May Affect, but are not Likely to Adversely Affect (NL-b)* the Wyoming toad. These actions would have a beneficial affect on toads, by reducing surface disturbance in habitat for the Wyoming toad. Construction activities located within 500 ft of open water and/or 100 ft of intermittent or ephemeral channels in potential and/or known toad habitat will be avoided.

Construction of artificial in-stream structures using heavy equipment and would utilize steel, geo-textile fabrics, and other materials within the water quality, watershed and soils management program *May Impact, but is not likely to contribute to the need for federal listing (MI)* of the Western boreal toad. Where these activities occur in proximity to toad habitat, there could be impacts from changes in hydrology and surface disturbance. If these areas can not be avoided during planning, there could be loss of individuals.

The construction of artificial in-stream structures using heavy equipment within the Water Quality, Watershed and Soils Management program *May Affect, and is Likely to Adversely Affect (LAA)* the Platte River and Colorado River species. These activities could result in a depletion of water to the Platte River system and would have an indirect negative impact on identified downstream species. Water depletion reduces minimum flows to down stream species, resulting in loss of habitat.

Close areas, including roads, where accelerated erosion is occurring within the Water Quality, Watershed and Soils Management program *May Affect, but are not Likely to Adversely Affect (NL-b)* the blowout penstemon. This action would have a beneficial affect on this species. Reducing surface disturbance in locations where this plant occurs would generally benefit the success of individuals. Natural disturbance from active dunes is part of the life history of these plants and sufficient to meet the needs of this species.

Allowing for surface discharges of produced water; installing stream crossings for appropriate sediment and flow passage (culverts, bridges); developing riparian/wetland exclosures; channel restoration using heavy equipment; and cutting, planting, and seeding to restore function in riparian/wetland areas within the Water Quality, Watershed and Soils Management program *May Affect, but are not Likely to Adversely Affect (NL-i/NL-d)* the Colorado butterfly plant and Critical habitat, and Ute Ladies'-tresses. Where these activities occurred in proximity to these plants, there could be impacts from changes in hydrology and surface disturbance. If these areas can not be avoided during planning, there would be loss of individuals. Developing riparian/wetland exclosures excludes grazing and would have beneficial impacts to some individual plants. Surface discharge could potentially improve hydrologic conditions for these species; however it is uncertain if the positive effects would out-weigh the negative impacts from increased channel instability and potential increases in sediment loads.

Restricting surface disturbance near water resources and sensitive soils; and closing roads and areas where accelerated erosion is occurring within the Water Quality, Watershed and Soils Management program *May Affect, but are not Likely to Aversely Affect (NL-b)* Colorado butterfly plant and Critical habitat, and Ute Ladies'-tresses. These actions would have a beneficial affect on these species. Reducing surface disturbance in locations where this plant occurs would generally benefit the success of individuals.

Limiting surface disturbance and prohibiting new permanent structures in the Encampment River watershed within the Water Quality, Watershed and Soils Management program *May Affect, but are not Likely to Aversely Affect (NL-b)* the Ute Ladies'-tresses. These actions would have a beneficial affect on these species by limiting the surface disturbance and therefore the negative impacts to individuals where these actions would have occurred.

Wildlife and Fish

Activity Description Summary

Through wildlife and fisheries habitat management program the BLM maintains and enhances habitat for a diversity of wildlife and fish species and provides habitat for threatened, endangered, candidate, proposed, and special status animal and plant species in compliance with the ESA and approved recovery plans. Additionally, the BLM wildlife habitat management program supports population objective levels in the WGFD strategic plan.

Activities associated with the wildlife and fish program include, but are not limited to, the following actions: 1) Predator control (cooperation with APHIS); 2) construction of artificial structures for raptors; 3) guzzler development; 4) modify fences; 5) develop islands; 6) road closure (permanent/seasonal); 7)

construct enclosures; 8) construct reservoirs and pits; 9) chemically remove non-native fish species; 10) remove or replace barriers to fish passage (e.g., culverts, in-stream structures).

Impact Analysis and Effects Determination

Predator control (in cooperation with APHIS) within the wildlife and fish program *May Affect, and is Likely to Adversely Affect (LAA)* the black-footed ferret. Predator control actions may cause a direct loss of a black-footed ferret as the result of using poisons that may accidentally become ingested by the ferrets. The use of traps and snares for target species (i.e., coyotes) could accidentally injure or kill a ferret.

Construction of artificial structures for raptors, guzzler development, modify fences, construction of reservoirs and pits within the Wildlife and Fish Management Program *May Affect, but are not Likely to Adversely Affect (NL-i/NL-d)* the black-footed ferret. Artificial structures for raptors that are too close to prairie dog towns may cause excess depredation of prairie dogs the primary prey source for black-footed ferrets. Also, these structures will provide perching opportunities for raptors and owls to prey on black-footed ferrets; especially great-horned owl predation at night. Water developments could result in greater presence of predators that prey upon black-footed ferrets, e.g. coyotes. However, the potential increased predation would not have a significant impact on the populations of the prairie dog/black-footed ferret. The development of guzzlers, water facilities (reservoirs and pits), and modifying fences may impact the black-footed ferret during construction and maintenance of these projects due to the temporary displacement of prey habitat and human presence during construction. There is also the possibility of drowning however the likelihood is very low.

Road closure (permanent/seasonal) within the Wildlife and Fish Management Program *May Affect, but are not Likely to Adversely Affect (NL-b)* the black-footed ferret. Road closures reduce and/or eliminate human activity, temporary displacement, and possible harm and/or death of a ferret.

Modification of fences; construction of enclosures; construction of reservoirs and pits; chemically remove non-native fish species; removing or replacing barriers to fish passage (e.g., culverts, in-stream structures) within the Wildlife and Fish Management Program *May Affect, but are not Likely to Adversely Affect (NL-i/NL-d)* the Preble's meadow jumping mouse and its critical habitat. Construction of reservoirs and pits and human presence may temporarily displace or result in the loss of a mouse during construction. Preble's habitat may be lost from construction and subsequent change of water table from a reservoir up or down stream. There is also the possibility that these habitat modifications would result in greater presence of predators that prey upon Preble's meadow jumping mouse, e.g. coyotes. Human activity and actions associated with habitat improvement techniques including chemically removing non-native fish species, the removal and replacement of fish passage barriers, and other associated habitat modification activities may also temporarily displace or result in the loss of a mouse during these activities. Some habitat may be altered during construction or as a result of human presence along these riparian areas. Increased human activity during fence modification and enclosure construction operations could temporarily displace the Preble's meadow jumping mouse. Vehicle use during construction and maintenance activities may result in the loss of a mouse or altering of habitat. In the short-term, there may be minimal impacts to this species from human activity and construction; however, surface-disturbing and disruptive activities will be intensively managed to maintain or enhance identified potential (within 300 feet of the identified 100-year floodplain) or known habitat for the Preble's meadow jumping mouse.

Road closures (permanent/seasonal) within the Wildlife and Fish Management Program *May Affect, but are not Likely to Adversely Affect (NL-b)* the Preble's meadow jumping mouse and its critical habitat. These actions would have a beneficial affect on this species by closing areas and reducing vehicle access,

thereby minimizing human presence and creating undisturbed habitat for mouse. Areas closed permanently would also create additional habitat over the long-term as the roads revegetated.

Road closures (permanent/seasonal), construct reservoirs and pits within the Wildlife and Fish Management Program *May Affect, but are not Likely to Adversely Affect (NL-b)* the Canada lynx. These actions would have a beneficial affect on this species by closing areas and reducing vehicle access, thereby minimizing human presence and creating undisturbed habitat for lynx.

Predator control (in cooperation with APHIS) within the Wildlife and Fish Management Program *May Affect, and is Likely to Adversely Affect (LAA)* the bald eagle. Predator control actions may cause an indirect loss of a bald eagle through ingesting poisoned prey. The use of traps and snares for target species (i.e., coyotes) could accidentally injure or kill a bald eagle.

Modifying fences, developing islands, constructing reservoirs and pits, chemically removing non-native fish species, and remove or replace barriers to fish passage (e.g., culverts, in-stream structures) within the Wildlife and Fish Management Program *May Affect, but are not Likely to Adversely Affect (NL-i)* the bald eagle. Fish, native and non-native, compose a significant portion of a bald eagles diet. The loss of fish populations and the associated macro-invertebrates they feed upon, through chemical treatment of water to remove non-native fish, may force bald eagles to select other foraging areas. The modification of fences, development of islands, construction of reservoirs and pits, and the removal or replacement of barriers to fish passage would cause temporary displacement of eagles from human and equipment presence. However, development of islands and reservoirs would have a long-term beneficial impact by providing improved habitat.

Construction of artificial structures for raptors within the Wildlife and Fish Management Program *May Affect, but are not Likely to Adversely Affect (NL-b)* the bald eagle. Structures would be installed away from active nests and outside critical time periods for the eagle. These structures would expand use areas for the eagle.

Construction of reservoirs, pits, and exclosures within the Wildlife and Fish Management Program *May Affect, but are not Likely to Adversely Affect (NL-i/NL-d)* the Wyoming toad. Increased human activity during exclosure construction could temporarily displace the Wyoming toad. Vehicle use during construction activities may result in the loss of a Wyoming toad. Reservoirs and pits may be constructed to expand Wyoming toad habitat, however, the likelihood of this is remote due to the lack of BLM lands within the vicinity of potential habitat.

Road closures (permanent/seasonal) within the Wildlife and Fish Management Program *May Affect, but are not Likely to Adversely Affect (NL-b)* the Wyoming toad. This action would have a beneficial affect on this species by closing areas and reducing vehicle access, thereby minimizing human presence and creating undisturbed habitat for the toad.

The construction of reservoirs and pits within the Wildlife and Fish Management Program *May Affect, and is Likely to Adversely Affect (LAA)* the Platte River Species and the Colorado River Species. The construction of reservoirs and pits may affect Platte River and Colorado River species directly from water depletion. Also, the increased surface area of these developments will lead to increased evaporative loss of water thereby causing additional depletions to the systems.

Modifying fences and constructing exclosures within the Wildlife and Fish Management Program *May Affect, but are not Likely to Adversely Affect (NL-d)* the blowout penstemon. Vehicle use and human presence during modification activities may result in the loss of an individual plant; however, the likelihood of this is remote due to the number of actual fences located within or near habitat and the

ability for the BLM to implement conservation measures to reduce and/or eliminate impacts to the plant within potential or known habitat.

Road closures (permanent/seasonal), within the Wildlife and Fish Management Program *May Affect, but are not Likely to Adversely Affect (NL-b)* the blowout penstemon. This action would have a beneficial affect on this species by closing areas and reducing vehicle access, thereby minimizing human presence and protecting habitat for the plants.

Modifying fences, constructing exclosures, reservoirs, and pits within the Wildlife and Fish Management Program *May Affect, but are not Likely to Adversely Affect (NL-i/NL-d)* the Colorado butterfly plant and its Critical habitat and Ute ladies'-tresses. Human activity during the modification and construction of fences, reservoirs, and pits may cause the loss of habitat or of an individual plant.

Road closure (permanent/seasonal), and *May Affect, but are not Likely to Adversely Affect (NL-b)* the butterfly plant and Ute ladies'-tresses. This action would have a beneficial affect on this species by closing areas and reducing vehicle access, thereby minimizing human presence and protecting habitat for the plants.

Removing or replacing barriers to fish passage (e.g., culverts, in-stream structures) within the wildlife and fish program *May Impact, but are not likely to contribute to the need for federal listing (MI)* of the Western boreal toad. These projects would be implemented only if they resulted in maintaining or enhancing the toad habitat. The use of heavy equipment to achieve these goals may result in the loss of a toad or the short term loss of habitat. Also, the following conservation measure would be implemented: "For the protection of the western boreal toad and its identified habitat, surface-disturbing activities will be avoided in the following areas above 7500 feet: (a) identified 100-year flood plains; (b) areas within 500 feet from perennial waters, springs, wells, and wetlands; and (c) areas within 100 feet from the inner gorge of ephemeral channels." which would further reduce the likelihood of harming a toad.

Wild Horse Management

Activity Description Summary

The BLM wild horse program uses herding; corralling; transporting; monitoring; and roundups, which uses traps (temporary and permanent corrals), helicopters, and wranglers during roundups for wild horse management. The program considers range capability, trends in utilization, and public support.

Surface disturbing and other activities associated with the wild horse management program include, but are not limited to, the following actions: 1) construction of short-term temporary facilities (traps and holding facilities); 2) construction of long-term permanent facilities (corrals, boundary fences, water development); 3) and gatherings using helicopters and riders. (Table 7).

Impact Analysis and Effects Determination

Construction of long-term permanent facilities (boundary fences or water development) *May Affect, but is not Likely to Adversely Affect (NL-i)* the black-footed ferret.

Gatherings using helicopters and riders *May Affect, but is not Likely to Adversely Affect (NL-i)* the bald eagle. This would potentially disturb an eagle in the vicinity of the gather, but the bird should return upon completion of this short-term activity. However, surface-disturbance or disruptive activities potentially disruptive to nesting bald eagles will be prohibited within one mile of a bald eagle nest during the period of February 1 and July 15 for the protection of nesting areas. Also, there are no Herd Management Areas

within 2.5 miles of any known nest which further reduces the possibility of disturbing an eagle from this activity.

Cumulative Effects

Cumulative effects according to ESA 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 assessment. 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. This is different from NEPA cumulative effects.

The BLM is the majority landowner in the western portion (Carbon County) of the RFO, but is a minority landowner in the eastern portion (Albany and Laramie Counties). The BLM does control the majority of public access to the western portion of the RFO, while it only controls limited access in the eastern portion. In the eastern portion of the RFO, the cumulative impacts of BLM actions that would be taken under these alternatives are minor in proportion to potential impacts from actions on state and private lands. The wildlife habitat values of the public land parcels are important as undeveloped areas, usable by certain wildlife species (particularly T&E and Special Status species) that are located mostly on the BLM parcels.

The exact cumulative effect on T/E species is not known due to the lack of specific information on future state, local, or private actions in the planning area. Since most impacts to special status species are human related (e.g., recreational use), or the result of human activities (e.g., livestock management, mineral development, housing development), and the human pressures in the planning area may be expected to change over the foreseeable future, the scope and scale of the impacts are not known.

The cumulative effects of actions under these BLM programs and their activities may have local impacts to populations. If this occurs, then a determination of “May Affect” as the cumulative affect is obligatory. This would result in a request for a special consultation with the USFWS to ensure that appropriate analysis is conducted to minimize impacts to a species.

Analysis for T&E species will include no loss of critical habitats or their function. “Habitat function” means the arrangement of habitat features, and the capability of those features to sustain species, populations, and diversity of wildlife over time (a quantitative measure of habitat). Sites warranting this level of protection cannot be replaced or mitigated. Other extremely significant sites or habitats may also be designated irreplaceable. Recommendations to include additional sites within this category will be evaluated on a case-by-case basis and must be approved by the USFWS.

Where non-critical, but crucial habitats are present, and restoration or replacement may not be possible, analysis must be within the same location, have the same essential features, and support the same species. Habitat in this category directly limits a community, population, or subpopulation, and restoration or replacement may not be possible. Some modification of habitat characteristics may occur, provided habitat function is maintained (i.e., the location, essential features, and species supported are unchanged). These will be evaluated as part of the consultation with the USFWS.

REFERENCES

- Alexander, A.M. 1932. Control, not extermination of *Cynomys ludovicianus arizonensis*. *Journal of Mammalogy* 13(2): 302.
- Apple, L. 2001. Wyoming Game and Fish Department Meeting on Black-Footed Ferret Notes. October 20, 2001.
- Apps, C.D. 2000. Space-use, diet, demographics, and topographic associations of lynx in the southern Canadian Rocky Mountains: a study. Chapter 12 In Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, et al., tech eds. *Ecology and conservation of lynx in the United States*. Univ. Press of Colorado. Boulder, CO. 480pp.
- Armbruster, M. J. 1990. Characterization of habitat used by whooping cranes during migration. *Biological Report* 90(4):1-16.
- Armstrong, D. M. 1972. Distribution of mammals in Colorado. *Museum of Natural History Monograph*, University of Kansas, Lawrence. 415 pp.
- Armstrong, D.M., M.E. Bakeman, N.W. Clippinger, A. Deans, M. Marseilles, C. A. Meaney, C. Miller, M. O'Shea-Stone, T.R. Ryon and M. Sanders. 1997. Report On Habitat Findings of the Preble's Meadow Jumping Mouse. Report to U.S. Fish and Wildlife Service and the Colorado Division of Wildlife. Edited by M.E. Bakeman.
- Arnold, S.J., and R.J. Wassersug. 1978. Differential predation on metamorphic anurans by garter snakes (*Thamnophis*): social behavior as a possible defense. *Ecol.* 59:1014-1022.
- Aubry, K.B., G. Koehler, and J.R. Squires. 2000 Ecology of Canada lynx in southern boreal forests. Chapter 13 In Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, et al., tech eds. *Ecology and conservation of lynx in the United States*. Univ. Press of Colorado. Boulder, CO. 480pp.
- Aubry, K.B. and Associate. 1994. Pages 74-98 In Ruggiero and others 1994. *The scientific basis for conserving forest carnivores: American marten, fisher, lynx and wolverine in the western United States*. USDA Forest Service, Rocky Mountain Forest and Range Experiment Station. General Tech. Rep. RM-254. 184pp.
- Avian Power Line Interaction Committee. 1996. Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996. Edison Electric Institute/Raptor Research Foundation, Washington D.C.
- Baird, S.F., and C. Girard. 1852. Descriptions of new species of reptiles, collected by the U.S. Exploring Expedition under the command of Capt. Charles Wilkes, U.S.N.. *Proc. Acad. Nat. Sci. Phila.* 6:174.
- Bakeman, M. E. and A. Deans. 1997. Habitat of the Preble's meadow jumping mouse at Rocky Flats, Colorado. Pp. 19-35 in Report on habitat findings on the Preble's meadow jumping mouse (ed. M. Bakeman). Unpublished report to the U.S. Fish and Wildlife Service and the Colorado Division of Wildlife. 91 pp.
- Baldwin, P.H. 1971. "Diet of the Mountain Plover at the Pawnee National Grassland, 1970-71." Tech. Report. 134. Grassland Biome, U.S. International Biological Program.
- Baxter, G.T. and M.D. Stone. 1985. Amphibians and reptiles of Wyoming. Wyoming Game and Fish Dept., Cheyenne. 137pp.
- Beiswenger, R.E. 1981. Predation by gray jays on aggregating tadpoles of the boreal toad (*Bufo boreas*). *Copeia* 1981:274-276.
- Beauvais, G.P. 2001. Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*) in Wyoming: Status Report. Report prepared by Wyoming Natural Diversity Database

- Beauvais, G.P. and R. Smith. 1999. "Occurrence of Breeding Mountain Plovers (*Charadrius montanus*) in the Wyoming Basins Ecoregion." Prepared by the Wyoming Natural Diversity Database for the USDI Bureau of Land Management, Rock Springs, Wyoming.
- Bennett, J. and D. Keinath. 2001. Distribution and Status of the Yellow-billed Cuckoo (*Coccyzus americanus*) in Wyoming. Wyoming Natural Diversity Database, Laramie, WY.
- Bent, A.C. 1940. Life Histories of North American Cuckoos, Goatsuckers, Hummingbirds and Their Allies: Part 1. Smithsonian Institution, United States National Museum, Bull. 176. 1964 reprint by Dover Publications, Inc., New York, NY. Pp. 67-70.
- Bittner, S.L. and O.J. Rongstad. 1982. Snowshoe hare and allies. Pages 146-163 In J.A. Chapman and G.A. Feldhamer (eds). Wild mammals of North America. Johns Hopkins University Press, Baltimore, MD.
- Blair, W.F. 1964. Evidence bearing on relationships of the *Bufo boreas* group of toads. Texas J. Sci. 16:181-191.
- Boreal Toad Recovery Team. 2000. Report on the status and conservation of the boreal toad (*Bufo boreas boreas*) in the southern Rocky Mountains, 1999. Colorado Division of Wildlife, Denver, CO. 48pp.
- Boreal Toad Recovery Team. 2001a. Revised boreal toad conservation plan and agreement. Colorado Division of Wildlife, Denver, CO. 76pp + appendices.
- Boreal Toad Recovery Team. 2001b. Report on the status and conservation of the boreal toad (*Bufo boreas boreas*) in the southern Rocky Mountains, 2000. Colorado Division of Wildlife, Denver, CO. 58pp.
- Boreal Toad Recovery Team. 1998a. Conservation plan and agreement for the management and recovery of the southern Rocky Mountain population of the boreal toad (*Bufo boreas boreas*). Colorado Division of Wildlife, Denver, CO. 66pp + appendices.
- Boreal Toad Recovery Team. 1998b. Report on the status and conservation of the boreal toad (*Bufo boreas boreas*) in the southern Rocky Mountains, 1997. Colorado Division of Wildlife, Denver, CO. 40pp + appendix.
- Boreal Toad Recovery Team. 1999.
- Boyd, R. L., and B. C. Thompson. 1985. Evidence for reproductive mixing of least tern populations. Journal of Field Ornithology 56:405-406.
- Bradford, D.F. 1989. Allotopic distribution of native frogs and introduced fishes in high Sierra Nevada lakes of California: implications of the negative impact of fish introductions. Copeia 1989:775-778.
- Brainerd, S.M. 1985. Reproductive ecology of bobcats and lynx in western Montana. M.S. Thesis, Univ. of Montana, Missoula, MT. 85pp.
- Brand, C.J. and L.B. Keith. 1979. Lynx demography during a snowshoe hare decline in Alberta. J. Wildl. Manage. 43(4):827-849.
- L.B. Keith, and C.A. Fischer. 1976. Lynx responses to changing snowshoe hare densities in Alberta. J. Wildl. Manage. 40:416-428.
- Brocke, R.H. 1982. Restoration of the lynx (*Lynx canadensis*) in Adirondack Park: a problem analysis and recommendations. Federal Aid Project E-1-3 and W-105-R, Study XII, Job 5, Final Report. New York Department of Environmental Conservation.
- Brown, L. N. 1967. Seasonal activity patterns & breeding of the western jumping mouse (*Zapus princeps*) in Wyoming. American Midland Naturalist 78:460-470.

- Burger, W.L. and A.N. Bragg. 1946. Notes on *Bufo boreas* (B. and G.) from the Gothic Region of Colorado. Proc. Oklahoma Acad. Sci. 27:61-65.
- Burress, R.M. 1982. Effects of synergized rotenone on nontarget organisms in ponds. U.S. Fish Wildl. Serv., Invest. Fish Control No.91. 7pp.
- Bury, R.B. and J.A. Whelan. 1984. Ecology and management of the bullfrog. U.S. Fish Wildl. Serv., Res. Publ. 155. 23pp.
- Buehler, D.A. and L.B. Keith. 1982. Snowshoe hare distribution and habitat use in Wisconsin. Can. Field. Nat. 96:19-29.
- Buskirk, S.W., L.F. Ruggiero, K.B. Aubry, D.E. Pearson, J.R. Squires, and K.S. McKelvey. 2000. Comparative ecology of lynx in North America. Chapter 14 In Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, et al., tech eds. Ecology and conservation of lynx in the United States. Univ. Press of Colorado. Boulder, CO. 480pp.
- Call, M. W. 1978. Nesting habitats and surveying techniques for common western raptors. U.S. Department of the Interior, Bureau of Land Management, Technical Note No. 316. 115pp.
- Camp, C.L. 1917. Notes on the systematic status of the toads and frogs of California. Univ. Calif. Publ. Zool. 17:115-125.
- Campbell, J.P. 1970. Life history of *Bufo boreas boreas* in the Colorado Front Range. Unpubl. PhD. thesis., Univ. Colorado, Boulder. 104 pp.
- Campbell, J.P. and W.G. Degenhardt. 1971. *Bufo boreas boreas* in New Mexico. Southwestern Nat. 16:219-220.
- Carey, C. 1987. Status of a breeding population of the western toad, *Bufo boreas boreas*, at Lagunitas Campground, New Mexico. Unpubl. Rept., New Mexico Dept. Game and Fish Contract 516.6-74-26. 24pp.
- Carey, C. 1993. Hypothesis concerning the causes of the disappearance of boreal toads from the mountains of Colorado. Cons. Biol. 7:355-362.
- Carey, C., B.C. Osmundson, H. Ramsdell, L. Livo, and S. Brinkman. 1999. Disappearance of boreal toads in Colorado: A contaminant investigation. U.S. Fish and Wildl. Serv., Final Rept., 1994 and 1997 Project ID 6F30 Off-refuge, DEC ID #9560003. 49pp.
- Carothers, S.W. 1977. Importance, Preservation and Management of Riparian Habitats: an Overview. In R.R. Johnson and D.A. Jones (eds). Importance Preservation and Management of Riparian Habitats: a Symposium. Gen. Tech. Rep. RM-43. USDA Forest Serv., Denver, CO.
- Caughley, G. and A. Gunn. 1996. Conservation biology in theory and practice. Blackwell Science, Inc. Cambridge, Massachusetts. 459 pp.
- Center for Biological Diversity. January 21, 2001. "Natural History of the Western Yellow-billed Cuckoo." Available from: http://www.biologicaldiversity.org/swcbd/species/cuckoo/natural_history.html.
- Centers for Disease Control and Prevention, National Center for Infectious Diseases, Division of Vector Borne Infectious Diseases, Bacterial Zoonosis Branch, Plague Section (CDCP). 1998. Unpublished data.
- Choate, J. R., D. W. Moore, and J. K. Frey. 1991. Dispersal of the meadow jumping mouse in northern Kansas. Prairie Naturalist 23:127-130.
- Clark, T.W., and M.R. Stromberg. 1987. Mammals of Wyoming. University of Kansas Press Publication. Lawrence, Kansas. 314pp.

- Clary, W.P. and B.F. Webster. 1989. Managing Grazing of the Riparian Areas in the Intermountain Region. Gen. Tech. Rep. INT-263. USDA Forest Serv., Intermountain Res. Station, Ogden, UT. 11pp.
- Clippinger, N. W. In Preparation. Biogeography, ecology, and habitat of Preble's meadow jumping mouse (*Zapus hudsonius preblei*) in Colorado. Ph.D. Dissertation, University of Colorado, Boulder. Expected completion: 2002.
- Compton, S.A., R.D. Hugie, 1993. Status Report on *Zapus hudsonius preblei*, a Candidate Endangered Subspecies. Report prepared by Pioneer Environmental Consulting Services, Logan, Utah for the U. S. Fish and Wildlife Service.
- Conner, M. M., and T. M. Shenk. 2001. Use of morphological measurements to differentiate *Zapus hudsonius preblei* from *Zapus princeps* in Colorado and southeastern Wyoming. Prepared for U.S. Fish and Wildlife Service and Preble's Meadow Jumping Mouse Recovery Team. 35 pp. + Appendix 5. December 14, 2001.
- Cochran, P.A. 1983. *Rana pipiens* (leopard frog) predation. Herpetol. Rev. 14:18-19.
- Corn, J.G., C.A. Pague, A.R. Ellingson, M. Sherman, T. Zwięjac, G. Kittel, and C. Fleming. 1995. Final report on the geographic extent of the Preble's meadow jumping mouse population on the United States Air Force Academy. Presented to the U.S. Air Force Academy. 44pp.
- Corn, P.S. and J.C. Fogleman. 1984. Extinction of montane populations of the northern leopard frog (*Rana pipiens*) in Colorado. J. Herpetol. 18:147-152.
- Corn, P.S., W. Stolzenburg, and R.B. Bury. 1989. Acid precipitation studies in Colorado and Wyoming: interim report of surveys of montane amphibians and water chemistry. U.S. Fish Wildl. Serv., Biol. Rept. 80(40.26). 56pp.
- Corn, P.S. and F.A. Vertucci. 1992. Risk assessment of the effects of acid deposition on Rocky Mountain amphibians. J. Herpetol. 26:361-369.
- Cranford, J. A. 1999. Western jumping mouse (*Zapus princeps*). Pages 668-669 in D. E. Wilson and S. Ruff (editors). The Smithsonian book of North American mammals. Smithsonian Institution Press (Washington DC) in association with the American Society of Mammalogists.
- Davis, M. E. 1968. Nesting behavior of the least tern (*Sterna albifrons*).
- de Silva, G., H., R. A. Medilin Legorreta, M. A. Amin, and S. Aguilar. 1996. A concentration of mountain plovers *Charadrius montanus* in San Luis Potosi, Mexico. Cotinga 5:74-75.
- Dharman, A. T. 2001. Movement patterns of Preble's meadow jumping mouse. M.S. Thesis. Colorado State University, Fort Collins, Colorado.
- Dorn, J.L. and R.D. Dorn. 1990. Wyoming Birds. Mountain West Publishing, Cheyenne, WY.
- Ehrlich, P.R., D.S. Dobkin, and D. Wheye. 1992. Birds in Jeopardy: the Imperiled and Extinct Birds of the United States and Canada, Including Hawaii and Puerto Rico. Stanford Univ. Press, Stanford, CA.
- Eisenburg, J.F. 1986. Life history strategy of the Felidae: variations on a common theme. Pages 293-303 In S.D. Miller and D.D. Everett, Cats of the world: biology, conservation, and management. Natural Wildlife Federation, Washington, D.C.
- Fertig, W. and G. Beauvais. 1999. "Wyoming Plant and Animal Species of Special Concern." Unpublished report. Wyoming Natural Diversity Database, Laramie, Wyoming.

- Fertig, Walter. 2000. "Status of Blowout Penstemon (*Penstemon haydenii*) in Wyoming." Prepared by the Wyoming Natural Diversity Database for the Wyoming Cooperative Fish and Wildlife Research Unit, U.S. Fish and Wildlife Service, and Wyoming Game and Fish Department.
- Formanowicz, D.R. Jr., and E.D. Brodie Jr. 1982. Relative palatabilities of members of a larval amphibian community. *Copeia* 1982:91-97.
- Frandsen, J.C. and A.W. Grundmann. 1960. The parasites of some amphibians of Utah. *J. Parasitology* 46:678.
- Fuller, T.K. 1989. Population dynamics of wolves in north-central Minnesota. *Wildl. Monogr.* No. 105. 41pp.
- Gabrielson, I.N. and S.G. Jewett. 1940. Birds of the Pacific Northwest, with Special Reference to Oregon. Oregon State College. 1970 reprint by Dover Publication, New York, NY.
- Gaines, D. 1974. Review of the Status of the Yellow-billed Cuckoo in California: Sacramento Valley Populations. *Condor*: 76:204-209
- Garber, Christopher S. 1995. A status survey for Preble's jumping mouse (*Zapus hudsonius preblei*) in southeastern Wyoming, including F. E. Warren Air Force Base. Report prepared by C. Garber of the Wyoming Natural Diversity Database, Laramie, Wyoming for the U. S. Fish and Wildlife Service, Denver, Colorado.
- Goebel, A. 1996. Systematics and conservation of bufonids in North America and in the *Bufo boreas* species group. Unpubl. PhD dissertation, Univ. Colorado, Boulder. 274pp.
- Goebel, A. 1999. Genetic differentiation of the southern Rocky Mountain group of *Bufo boreas* based on mitochondrial DNA sequence and nuclear AFLP restriction site data. Report to the Colorado Division of Wildlife. 54pp.
- Goebel, A. 2000. Genetic analyses of *Bufo boreas* from the southeastern portion of the range (Utah, Idaho, Wyoming, and Colorado) based on mitochondrial DNA sequence and nuclear AFLP restriction site data. Final report to the U.S. Fish and Wildlife Service and the Utah Department of Natural Resources. 52pp.
- Good, Rheet, E. 2002. Powder River Basin Mountain Plover Surveys. Unpublished report, prepared for the Bureau of Land Management, Cheyenne, Wyoming by Western EcoSystems Technology, Inc., Cheyenne, Wyoming.
- Graul, W.D. 1975. Breeding Biology of the Mountain Plover. *Wilson Bulletin* 87:6-31.
- Greater Yellowstone Bald Eagle Working Group. 1996. Greater Yellowstone bald eagle management plan: 1995 update. Greater Yellowstone Bald Eagle Working Group, Wyoming Game and Fish Department, Lander, Wyoming. 47 pp.
- Grenier, Martin. 2004. Last Summer's Survey of Ferret Numbers in Wyoming's Shirley Basin Yields Unexpected Results – Finding Ferrets. *Wyoming Wildlife*. January 2004. p. 24-29.
- Grier, J.W. and R.W. Fyfe. 1987. Preventing research and management disturbance. In: Raptor management techniques manual. (B.A. Giron Pendleton, B.A. Millsap, K.W. Cline, and D.M. Bird, eds.) National Wildlife Federation, Washington, D.C. Pp. 173-182.
- Grover, P. B. 1979. Habitat requirements of charadriiform birds nesting on salt flats at Salt Plains National Wildlife Refuge. M. S. thesis, Oklahoma State University, Stillwater. 38 pp.
- Grunau L., R. Schoor, D. Green, B. Rosenlund, C. Pague, and J. Armstrong. 1999. Conservation and Management Plan for Preble's Meadow Jumping Mouse on the U.S. Air Force Academy. Report prepared by Colorado Natural Heritage Program for United States Air Force Academy Natural Resources.

- Hafner, D. J. 1997. Evaluation of the taxonomic, genetic, and conservation status of Preble's meadow jumping mouse, *Zapus hudsonius preblei*, and associated subspecies. Unpublished report to the Colorado Division of Wildlife. 8 pp.
- Hafner, D. J.; Petersen, K. E.; Yates, T. L. 1981. Evolutionary relationships of jumping mice (genus *Zapus*) of the southwestern United States. *Journal of Mammalogy*, 62(3): 501-512.
- Hafner, D. J., E. Yensen, and G. L. Kirkland, Jr. (eds.). 1998. North American rodents: Status survey and conservation action plan. International Union for the Conservation of Nature and Natural Resources, Gland, Switzerland. 171 pp.
- Hall, R. E. 1981. *The Mammals of North America: Second Edition*, two vols. John Wiley and Sons, New York, New York.
- Halterman, M.D. 1991. Distribution and Habitat Use of the Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*) on the Sacramento River, California, 1987-90. M.S. Thesis, Calif. State Univ. Chico, CA.
- Hamilton, W.J., III and M.E. Hamilton. 1965. Breeding characteristic of Yellow-billed Cuckoos in Arizona. *Proc. Calif. Acad. Sci.* 32:405-432.
- Hammerson, G.A. 1982. Bullfrogs eliminating leopard frogs in Colorado? *Herpetol. Rev.* 13:115-116.
- Hammerson, G.A. 1986. Amphibians and reptiles in Colorado. *Colo. Div. Wildl. Publ. DOWM- 1-3-86.* 136pp.
- Hammerson, G.A. 1989. A field survey of amphibians in the Rocky Mountains of Colorado. The Nature Conservancy, unpubl. rep. 53pp.
- Hardy, J. W. 1957. The least tern in the Mississippi River. Publication of the Museum, Michigan State University, Biological Series 1:1-60.
- Harmata, A. 1989. Bald eagle movement and habitat use. Job Completion Report. Wyoming Game and Fish Department. Unpublished report.
- Harte, J. and E. Hoffman. 1989. Possible effects of acid deposition on a Rocky Mountain population of the tiger salamander (*Ambystoma tigrinum*). *Conserv. Biol.* 3:149-158.
- Hayes, M.P. and M.R. Jennings. 1986. Decline of ranid frog species in western North America: are bullfrogs (*Rana catesbiana*) responsible? *J. Herpetol.* 20:490-509.
- Hews, D.K. 1988. Alarm response in larval western toads, *Bufo boreas*: release of larval chemicals by a natural predator and its effect on predator capture efficiency. *Anim. Behav.* 36:125-133.
- Hodges, K.E. 2000. The ecology of snowshoe hares in northern boreal forests. Chapter 6 In Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, et al., tech eds. *Ecology and conservation of lynx in the United States.* Univ. Press of Colorado. Boulder, CO. 480pp.
- Howe, M.A. 1987. Habitat use by migrating whooping cranes in the Aransas-Wood Buffalo corridor. Pages 303-311, in J. C. Lewis and J. W. Ziewitz, eds. *Proceedings 1985 Crane Workshop.* Platte River Whooping Crane Habitat Maintenance Trust and U.S. Fish and Wildlife Service, Grand Island, Nebraska.
- Howe, M.A. 1989. Migration of radio-marked whooping cranes from the Aransas-Wood Buffalo population; Patterns of habitat use, behavior, and survival. U.S. Fish and Wildl. Serv., Fish Wildl. Tech. Rept 21, 33pp.
- Hubbard, J.D. 1972. Some aspects of geographic variation in the boreal toad, *Bufo boreas boreas*. *Abs. Colorado-Wyoming Acad. Sci.* 7:65-66.

- Hughes, J.M. 1999. Yellow-billed cuckoo (*Coccyzus americanus*). The Birds of North America, No. 418. (A. Poole and F. Gill, eds.). Philadelphia: The Birds of North America, Inc.
- Hughes, J.M. 1999. Yellow-billed Cuckoo (*Coccyzus americanus*). In The Birds of North America, No. 418 (A. Poole and F. Gill, eds). The Birds of North America, Inc., Philadelphia, PA. 28pp.
- Jones, K.L. 1978. Status of *Bufo boreas* in New Mexico project. Unpubl. Rep., New Mexico Dept. Game and Fish. Contract 519-66-8. 9pp.
- Jones, G. S. 1981. The systematics and biology of the genus *Zapus* (Mammalia, Rodentia, Zapodidae). Ph.D. dissertation, Indiana State University, Terre Haute, Indiana.
- Jones, C. A. 1999. *Zapus hudsonius* in southern Colorado. Occasional papers of the Museum of Texas Tech University. No 191. 7 pp.
- Keinath, D.A. 2001. Survey for Preble's meadow jumping mice (*Zapus hudsonius preblei*) on F. E. Warren Airforce Base, Cheyenne, Wyoming, 2000. Report prepared by Wyoming Natural Diversity Database.
- Keinath, D.A. and D. Ehle. 2001. Survey for Mountain Plover (*Charadrius montanus*) on Federal Lands in the Powder River Basin. Unpublished report, prepared for the Bureau of Land Management, Cheyenne, Wyoming by Wyoming natural Diversity Database, University of Wyoming, Laramie, Wyoming.
- Kirsch, P.H. 1888. Notes on a collection of fishes obtained in the Gila River at Ft. Thomas, Arizona, by Lieutenant W.L. Carpenter, U.S. Army. Proceedings U.S. National Museum 11:555-558.
- Knopf, F.L., and B. J. Miller. 1994. *Charadrius montanus* – Montane, grasslands, or bare-ground plover? Auk 111:504-506.
- Knopf, F.L., and J.R. Rupert. 1995. Habits and habitats of mountain plovers in California. Condor 97:743-51.
- Knopf, F.L., and J.R. Rupert. 1996. Reproduction and movements of Mountain Plovers breeding in Colorado. Wilson Bulletin 108:28-35.
- Knowles, C.J., and P. R. Knowles. 1984. Addition records of Mountain Plovers using prairie dog towns in Montana. Prairie Naturalist 16:183-186.
- Koehler, G.M. 1990. Population and habitat characteristics of lynx and snowshoe hares in north central Washington. Canadian J. Zoology. 68:845-851.
- Koehler, G.M. and J.D. Brittell. 1990. Managing spruce-fir habitat for lynx and snowshoe hares. J. Forestry 88:10-14.
- Koller, R.L. and A.J. Gaudin. 1977. An analysis of helminth infections in *Bufo boreas* (Amphibia: Bufonidae) and *Hyla regilla* (Amphibia: Hylidae) in southern California. Southwest Nat. 21:503-509.
- Kotliar, N.B., B.W. Baker, A.D. Whicker, G. Plumb. 1999. A critical review of assumptions about the prairie dog as a keystone species. Environmental Management 24 (2): 177-192.
- Krebs, C.J., S. Boutin, R. Boonstra, A.R.E. Sinclair, J.N.M. Smith, M.R.T. Dale, K. Martin and R. Turkington. 1995. Impact of food and predation on the snowshoe hare cycle. Science 269:1112-1115.
- Krutzsch, P.H. 1954. North American jumping mice (genus *Zapus*). University of Kansas Museum of Natural History Publication 7:349-472.

- Laurion, T.R. and B. Oakleaf. 1998. Wyoming Lynx Inventories Completion Report In Threatened, Endangered, and Nongame Bird and Mammal Investigations-Annual Completion Rep. Wyoming Game and Fish Dept. Nongame Program, Lander, WY.
- Laven, R.D., P.N. Omi, J.G. Wyant, and A.S. Pinkerton. 1980. Interpretation of fire scar data from a ponderosa pine ecosystem in the central Rocky Mountains, Colorado. In: M.A. Stokes and J.H. Dieterich (eds.). Proceedings of the Fire History Workshop; 1980 Oct. 20-24; Gen. Tech. Rep. RM-81; Tucson, AZ: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Laymon, S.A. and M. Halterman. 1987. Can the western subspecies of the yellow-billed cuckoo be saved from extinction? *Western Birds* 18: 19–25.
- Laymon, S.A. 1980. Feeding and Nesting Behavior of the Yellow-billed Cuckoo in the Sacramento Valley. *Wildl. Manage. Admin. Rep.* 80-2, Calif. Dept. Fish and Wildl., Sacramento, CA.
- Leachman, B. and B. Osmundson. 1990. Status of the mountain plover: a literature review. Unpublished report to the U.S. Forest Service, Fish and Wildlife Enhancement, Golden, Colorado. 83 pp.
- Licht, L.E. 1968. Unpalatability and toxicity of toad eggs. *Herpetologica* 24:93-98.
- Licht, L.E. 1969. Palatability of *Rana* and *Hyla* eggs. *Am. Mid. Nat.* 82:296-298.
- Lingle, G.R. 1987. Status of whooping crane migration habitat within the Great Plains of North America. Pages 331-340 in J. C. Lewis and J. Zewitz, eds., Proceedings 1985. Crane Workshop. Platte River Whooping Crane Habitat Maintenance Trust and U.S. Fish and Wildlife Service, Grand Island, Nebraska.
- Lingle, G.R., G.A. Wingfield, and J.W. Ziewitz. 1991. The migration ecology of whooping cranes in Nebraska, U.S.A. Pages 395-401 in J. Harris, ed., Proceedings 1987 International Crane Workshop, International Crane Foundation, Baraboo, Wisconsin.
- Longley, W. H. 1970. Sandhill cranes at the Carlos Avery Wildlife Area. *The Loon* 4:124-128.
- Litvaitis, J.A. and D.J. Harrison. 1989. Bobcat-coyote niche relationships during a period of coyote population increase. *Canadian J. of Zool.* 67:1180-1188.
- Livo, L. J. 1999. Role of predation in the early life history of *Bufo boreas* in Colorado. PhD thesis, University of Colorado. 197pp.
- Long, C.A. 1965. The mammals of Wyoming. University of Kansas Museum of Natural History Publication 14: 493-758.
- Major, A.R. 1989. Lynx, *Lynx canadensis* (Kerr) predation patterns and habitat use in the Yukon Territory, Canada. M.S. Thesis, State Univ. of New York, Syracuse.
- Marsh, R.E. 1984. "Ground Squirrels, Prairie dogs, and Marmots as Pests on Rangeland." Proceedings of the Conference for Organization and Practice of Vertebrate Pest Control. ICI Plant Protection Division, Fernherst, UK.
- McCord, C.M. and J.E. Cardoza. 1982. Bobcat and lynx. Pages 728-766 In J.A. Chapman and G.A. Feldhamer (eds). *Wild mammals of North America*. Johns Hopkins University Press, Baltimore, MD.
- McKay, R. 1991. Biological assessment and inventory plan for the North American lynx (*Felis lynx canadensis*) in the Uinta Mountains. Unpublished., Ashley National Forest and Utah Natural Heritage Program, Utah Department of Natural Resources, Salt Lake City, UT.

- McKelvey, K.S., S.W. Buskirk, and C.J. Krebs. 2000. Historic and current distribution of lynx in the contiguous United States. Chapter 8 In Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, et al., tech eds. Ecology and conservation of lynx in the United States. Univ. Press of Colorado. Boulder, CO. 480pp.
- Meaney, C.A., N.W. Clippinger, A. Deans, and M. O'Shea-Stone. 1996. Second year survey for Preble's meadow jumping mouse (*Zapus hudsonius preblei*) in Colorado. Prepared for Colorado Division of Wildlife. 21pp. + appendices.
- Meaney, C.A., A. Ruggles, B. Lubow, N.W. Clippinger, and A. Deans. 1999. Preliminary Results: second year study of the impact of trails on small mammals and population estimates for Preble's meadow jumping mice on City of Boulder Open Space. Draft report for Greenways Program, City of Boulder Transportation Department, City of Boulder Open Space, and U.S. Environmental Protection Agency, Region 8.
- Mehl, M.S. 1992. Old-growth descriptions for the major forest cover types in the Rocky Mountain Region. In: Old-Growth Forests in the Southwest and Rocky Mountain Regions - Proceedings of a workshop. U.S. Dept. of Agriculture Forest Service. General Technical Report RM-213.
- Hornocker, M.G. and Associate. 1991. Seasonal resource use among mountain lions, bobcats and coyotes. J. Mammal 72:391-396.
- Miller, B., G. Ceballos, and R.P. Reading. 1994. "The prairie dog and biotic diversity." Conservation Biology 8:677-681. Samson and Knopf. 1994. "Prairie Conservation in North America." BioScience 44 (6).
- Minckley, W. L. 1973. Fishes of Arizona. Arizona Game and Fish Department, Phoenix, Arizona. 293 pp.
- Minckley, W. L. 2003. A conservation plan for native fishes of the Lower Colorado River. BioScience 53: 219-234.
- Minta, S.C. and T.M. Campbell III. 1991. Recommendations for Wildlife and Habitat Protection, Teton County, Wyoming. Prepared for Teton County Board of County Commissioners. Biota Research and Consulting, Inc. 20pp.
- Monthey, R.W. 1986. Responses of snowshoe hares, *Lepus americanus*, to timber harvesting in northern Maine. Can. Field Nat. 100:568-570.
- Morrison, J. L. 1992. Persistence of the meadow jumping mouse, *Zapus hudsonius luteus*, in New Mexico. Southwestern Naturalist 37:308-311.
- Moseley, R.K. 1998. Ute Ladies'-tresses (*Spiranthes diluvialis*) in Idaho: 1997 Status Report. Report prepared by the Idaho Conservation Data Center, Boise, ID.
- Mowat, G., K.G. Poole, and M. O'Donoghue. 2000. Ecology of lynx in northern Canada and Alaska. Chapter 9 In Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, et al., tech eds. Ecology and conservation of lynx in the United States. Univ. Press of Colorado. Boulder, CO. 480pp.
- Moyle, P.B. 1973. Effects of introduced bullfrogs, *Rana catesbiana*, on the native frogs of the San Joaquin Valley, California. Copeia 1973:18-22.
- Murray, D.L. and S. Boutin. 1991. The influence of snow on lynx and coyote movements: does morphology affect behavior? Oecologia. 88:463-469.
- National Park Service (NPS). 1997. Snake River Management Plan. Grand Teton National Park, Jackson, WY.
- Nellis, C.H., S.P. Wetmore, and L.B. Keith. 1972. Lynx-prey interactions in central Alberta. J. Wildl. Manage. 36(2):320-329.

- New Mexico Department of Game and Fish. 1988. Handbook of species endangered in New Mexico. D-108:1-2.
- O'Donoghue, M., S. Boutin, C.J. Krebs, and E.J. Hofer. 1997. Numerical responses of coyotes and lynx to the snowshoe hare cycle. *Oikos* 74:115-121,
- O'Donoghue, M. and Associates. 1994. Winter habitat selection by lynx and coyotes in relation to snowshoe hare abundance. *Canadian J. of Zool.* 72:1444-1451.
- Olsen, P.F. 1981. Sylvatic Plague. In *Infectious Diseases of Wild Mammals*. J. Davis, L. Karstadt, and D. Trainer, eds. Iowa State University, Ames, Iowa. 232-243.
- Olson, S. L. 1984. Density and distribution, nest site selection, and activity of the Mountain Plover on the Charles M. Russell National Wildlife Refuge. M.S. Thesis. University of Montana, Missoula, Montana. 62pp.
- Olson, D.H. 1989. Predation on breeding western toads (*Bufo boreas*). *Copeia* 1989:391-397.
- Pague, C. and L. Grunau. 2000. Factbook on the Preble's meadow jumping mouse (*Zapus hudsonius preblei*). Draft 9 January 2000. Preble's Meadow Jumping Mouse Science Team, Boulder, Colorado.
- Parker, G.R. 1981. Winter habitat use and hunting activities of lynx (*Lynx canadensis*) on Breton Island, Nova Scotia. In J.A. Chapman and D. Pursley, eds. *Proceedings of the 1980 Worldwide Furbearer Conference*, Frostburg, Maryland.
- Parker, G.R., J.W. Maxwell, L.D. Morton, and G.E.J. Smith. 1983. The ecology of the lynx (*Lynx canadensis*) on Cape Breton Island. *Can. J. Zool.* 61:770-786.
- Parrish, T.L., S.H. Anderson, and W.F. Oelklaus. 1993. "Mountain Plover Habitat Selection in the Powder River Basin, Wyoming." *Prairie Naturalist* 25: 219-226.
- Pechmann, J.H.K., D.E. Scott, R.D. Seinlitsch, J.P. Caldwell, L.J. Vitt, and J.W. Gibbons. 1991. Declining amphibian populations. The problem of separating human impacts from natural fluctuations. *Science* 252:892-895.
- Poole, K.G. 1994. Characteristic of an unharvested lynx population during a snowshoe hare decline. *J. Wildl. Manage.* 58:608-618.
- Potter, E. 1980. Notes on Nesting Yellow-billed Cuckoos. *J. Field Ornithol.* 51:17-29.
- Primack, R. B. 1998. *Essentials of conservation biology*. Sinauer Associates, Sunderland, Massachusetts. 660 pp.
- Quimby, D.C. 1951. The life history and ecology of the jumping mouse, *Zapus hudsonius*. *Ecological Monographs* 21:61-95.
- Quinn, N.W.S. and G. Parker. 1987. Lynx Pages 683-694 In Novak, N. and M. Obbard (eds). *Wild furbearer management and conservation in North America*. Ministry of Natural Resources, Toronto, Ontario.
- Reeve, A., F. Lindzey, and S. Buskirk. 1986. Pages 11-26 In *Historic and recent distribution of lynx in Wyoming*. Wyoming Cooperative Fishery and Wildlife Research Unit, Laramie, WY. 55pp.
- Riggs, L. A., J. M. Dempcy, and C. Orrego. 1997. Evaluating distinctness and evolutionary significance of Preble's meadow jumping mouse: phylogeography of mitochondrial DNA non-coding region variation. Colorado Division of Wildlife, Denver, Colorado.

- Ruediger, D., S. Mighton, B. Naney, T. Rinaldi, F. Wahl, N. Warren, D. Wenger, A. Williamson, L. Lewis, B. Holt, G. Patton, A. Vandehey, and S. Gniadek. 2000. Canada Lynx Conservation Assessment and Strategy. Unpublished interagency document prepared for the U.S. Forest Service, U.S. Fish and Wildlife Service, Bureau of Land Management, and National Park Service. Missoula, MT. 132pp.
- Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, G.M. Koehler, C.J. Krebs, K.S. McKelvey, and J.R. Squires. 2000. Ecology and Conservation of Lynx in the United States. University Press of Colorado, Boulder, CO. 480pp.
- Rumancik, Jr. J. P. 1988. Population survey of the interior least tern on the Mississippi River from Cape Girardeau, Missouri to Greenville, Mississippi, 1988. U. S. Army Corps of Engineers, Memphis District, Memphis, Tennessee. Unpublished report. 25 pp. and appendices.
- Rumancik, Jr. J. P. 1989. Population survey of the interior least tern on the Mississippi River from Cape Girardeau, Missouri to Vicksburg, Mississippi, 1989. U. S. Army Corps of Engineers, Memphis District, Memphis, Tennessee. Unpublished report.
- Ryon, T. R. 1999. Travel distance and movement patterns of the Preble's meadow jumping mouse (*Zapus hudsonius preblei*) at the Rocky Flats Environmental Technology Site. Journal of Colorado-Wyoming Academy of Science 31:12.
- Ryon, T. R. 2001. Summer nests of the Preble's meadow jumping mouse. Southwestern Naturalist 46:376-378.
- Saunders, J.K., Jr. 1963. Food habitats of the lynx in Newfoundland. J. Wildl. Manage. 27(3):384-390.
- Schultz, R.K. and W.C. Leininger. 1990. Differences in Riparian Vegetation Structure Between Grazed Areas and Exclosures. J. of Range Manage. 43:295-299.
- Scott, Shirley L., Editor. 1987. Field guide to the birds of North America, second edition. National Geographic Society, Washington, D.C. 464 pages.
- Schorr, R. A. 2001. Meadow jumping mice (*Zapus hudsonius preblei*) on the U. S. Air Force Academy El Paso County, Colorado. USDOD Air Force Academy, Colorado.
- Schulenberg, E., J. H. Schulenberg, and M. B. Schulenberg. 1980. Distribution and ecological study of the least tern in Kansas. Kansas Fish and Game Commission. Non-game wildlife project. 110 pp.
- Sheldon, C. 1934. Studies on the life histories of *Zapus* and *Napaeozapus* in Nova Scotia. Journal of Mammalogy 15:290-300.
- Shenk, T. M. 1998. Conservation assessment and preliminary conservation strategy for Preble's meadow jumping mouse (*Zapus hudsonius preblei*). Unpublished report of the Colorado Division of Wildlife. 38 pp + appendix.
- Shenk, T. M. and J. T. Eussen. 1998. Habitat use and distribution of Preble's meadow jumping mouse (*Zapus hudsonius preblei*) in Larimer and Weld counties, Colorado. Unpublished report of the Colorado Division of Wildlife. 25 pp. + figures.
- Shenk, T. M. and M. M. Sivert. 1999a. Movement patterns of Preble's meadow jumping mouse (*Zapus hudsonius preblei*) as they vary across time and space. Unpublished report of the Colorado Division of Wildlife. 27 pp. + figures.
- Shenk, T. M. and M. M. Sivert. 1999b. Temporal and spatial variation in the demography of Preble's meadow jumping mouse (*Zapus hudsonius preblei*). Unpublished report of the Colorado Division of Wildlife. 16 pp.

- Slough, B.G. and G. Mowat. 1996. Lynx population dynamics in an untrapped refugium. *J. Wildl. Manage.* 60:946-961.
- Smith, D.S. 1984. Habitat use, home range, and movements of bobcats in western Montana. M.S. Thesis, Univ. of Montana, Missoula, MT. 58pp.
- Smith, H.M., T.P. Maslin and R.L. Brown. 1965. Summary of the distribution of herpetofauna of Colorado. Series Biol. no. 15, Univ. Colo. Press. 52pp.
- Smith, J. W., and R. B. Renken. 1990. Improving the status of endangered species in Missouri: least tern investigations. Final report, Jobs 1 and 2, Missouri Department of Conservation endangered species project SE-OI-19.
- Squires, J.R. and T. Laurion. 2000. Lynx home range and movement in Montana and Wyoming – preliminary results. Chapter 11 In Ruggiero, L.F. , K.B. Aubry, S.W. Buskirk, et al., tech eds. Ecology and conservation of lynx in the United States. Univ. Press of Colorado. Boulder, CO. 480pp.
- Stalmaster, M.V. 1976. Winter Ecology and Effects of Human Activity on Bald Eagles in the Nooksack River Valley, Washington. M.S. Thesis, West Washington State Coll., Bellingham, WA. 100pp.
- Stalmaster, M.V. 1987. The Bald Eagle. New York: Universe Books. 227 pp.
- Staples, W.R. 1995. Lynx and coyote diet and habitat relationships during a low hare population on the Kenai Peninsula, Alaska. M.S. Thesis, Univ. of Alaska, Fairbanks.
- Stebbins, R.C. 1985. Western reptiles and amphibians. Houghton Mifflin, Boston, MA. 336pp.
- Steenhof, K. 1976. The Ecology of Wintering Bald Eagles in Southeastern South Dakota. M.S. Thesis. University of Missouri, Columbia, Missouri.
- Stolzenburg, W. 1989. What are the toads telling us? *Colo. Outdoors* 38:24-27.
- Stuart, J.N. and C.W. Painter. 1994. A review of the distribution and status of the boreal toad, *Bufo boreas boreas*, in New Mexico. *Bull. Chicago Herp. Soc.* 29:113-116.
- Stubbendieck, J., J. Lamphere, and J.B. Fitzgerald. 1997. Nebraska Threatened and Endangered Species, Blowout Penstemon. Nebraska Game and Parks Commission. Pamphlet.
- Swenson, J.E., K.L. Alt, and R.L. Eng. 1986. Ecology of Bald Eagles in the Greater Yellowstone Ecosystem. *Wildlife Manager* 95:1-46.
- Swisher, J.F. 1964. "A Roosting Area of the Bald Eagle in Northern Utah." *Wilson Bulletin* 76(2): 186–187.
- Tiekotter, K.L. and H.W. Manter. 1977. A study of trematodes collected from toads of a Colorado alpine meadow. Abstract in: *Proc. Nebraska Acad. Sci. and Affiliated Soc.* 87:22.
- Travsky, A. L. 1997. F. E. Warren Air Force Base: Surveys for the Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*). Report prepared by Amber Travsky of Real West Natural Resource Consulting for the U. S. Air Force, F.E. Warren Air Force Base.
- U.S. Army Corp of Engineers (COE). 1989. Jackson Hole, Wyoming, Environmental Assessment, Snake-Gros Ventre Rivers, Debris Clearance Project. Walla Walla District. April 1989.
- U.S. Bureau of Land Management. 1990. Great Divide Resource Area Record of Decision and Approved Resource Management Plan.

- U.S. Bureau of Land Management. 1998. Fire Management Implementation Plan for the BLM-administered lands in the State of Wyoming.
- USDI, Bureau of Land Management. 2001. "Opal Loop Natural Gas Pipeline and Compressor Station, Sublette, Sweetwater, and Lincoln Counties, Wyoming." Kemmerer and Rock Springs Field Office.
- U.S. Department of the Interior. 1984. Endangered and Threatened Wildlife and Plants; Determination That *Bufo Hemiphrys Baxteri* (Wyoming Toad) is an Endangered Species. Federal register, Vol. 49, No. 11, Tuesday, January 17, 1984, Rules and Regulations. Pages 1992-1994.
- U.S. Department of the Interior. 1998. Endangered and threatened wildlife and plants; final rule to list the Preble's meadow jumping mouse as a Threatened Species. Federal Register 63:26517-26530.
- U.S. Department of the Interior. 2001. Endangered and threatened wildlife and plants; final rule to list the Preble's meadow jumping mouse as a Threatened Species. Federal Register 66:28125-28131.
- U.S. Department of the Interior. 2002. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*) Federal Register July 17, 2002 (Volume 67, Number 137). DOCID:fr17jy02-49
- USDI U.S. Fish and Wildlife Service. February 17, 2000. Service finds Yellow-billed Cuckoo May Require Endangered Species Act Protection. Available from: <http://news.fws.gov/newsreleases>.
- USDI U.S. Fish and Wildlife Service. 2001. Notice of 12-month Finding for a Petition to List the Yellow-billed Cuckoo in the Western Continental United States. Federal Register: July 25, 2001 (Volume 66, Number 143, Page 38611–38626). From the Federal Register online via GPO access [wais.access.gpo.gov].
- USDI, U.S. Fish and Wildlife Service. 1995. "Ute Ladies-tresses (*Spiranthes diluvialis*) Recovery Plan." U.S. Fish and Wildlife Service, Denver, Colorado. 46 pp.
- USDI, U.S. Fish and Wildlife Service. 1989. Black-Footed Ferret Survey Guidelines for Compliance with the Endangered Species Act. USDI FWS. Denver, Colorado. 14 pp.
- USDI, U.S. Fish and Wildlife Service. 1995. Endangered Species: Whooping Crane (*Grus Americana*). Biologue Series.
- USDI, U.S. Fish and Wildlife Service. 1999. U.S. Fish and Wildlife Service Announces Discovery of Endangered Plant, Blowout Penstemon, in Wyoming. News Release, Mountain-Prairie Region.
- USDI, U.S. Fish and Wildlife Service 1986. Recovery Plan for the Pacific Bald Eagle. U.S. Fish and Wildlife Service, Portland, OR. 160pp.
- U.S. Fish and Wildlife Service. 2001. Guidance on Ditch Maintenance Activities. Memo from LeRoy W. Carlson, Colorado Field Supervisor, dated March 21, 2002.
- U.S. Fish and Wildlife Service. 2003. Draft Preble's Meadow Jumping Mouse Recovery Plan. In preparation.
- Van Zyll de Jong, C.G. 1966. Food habits of the lynx in Alberta and the Mackenzie District, Northwest Territories. Can. Field-Nat. 80:18-23.
- Vanicek, C.D. and R.H. Kramer. 1969. Life history of the Colorado squawfish, *Ptychocheilus lucius*, and the Colorado chub, *Gila robusta*, in the Green River in Dinosaur National Monument, 1964-1966. Transactions of the American Fisheries Society 98(2):193-208.
- Voris, H.K. and J.P. Bacon, Jr. 1966. Differential predation on tadpoles. Copeia 1966:594-598.

- Wagner, R.A. 1955. Basic survey of Lake Mohave. Completion Report, Project F-2-R-1. Wildlife Restoration Division, Arizona Game and Fish Department, Phoenix, Arizona. 16 pp.
- Wallis, C. A., and C. R. Wershler. 1981. Status and breeding of Mountain Plovers (*Charadrius montanus*) in Canada. Canadian Field-Naturalist 95:133-136.
- Ward, R.P.M. and C.J. Krebs. 1985. Behavioral responses of lynx to declining snowshoe hare abundance. Can. J. Zool. 63:2817-2824.
- Watson, S. R. 1966. Seabirds of the tropical Atlantic Ocean. Smithsonian Press, Washington, D. C. 230 pp.
- Whitman, P. L. 1988. Biology and conservation of the endangered interior least tern: a literature review. U. S. Fish and Wildlife Service Biological report 88(3). 22 pp.
- Wilson, E. C., S. H. Anderson, and W. A. Hubert. 1989. Evaluation of habitat suitability criteria proposed in Armbruster (1986) for the interior least tern on the Platte River, Nebraska, and adjacent sand pits during the 1989 nesting season. U.S. Fish and Wildlife Service, Wyoming Cooperative Fish and Wildlife Research Unit, Laramie, Wyoming. Unpublished report.
- Wilson and S. Ruff (editors). The Smithsonian book of North American mammals. Smithsonian Institution Press (Washington DC) in association with the American Society of Mammalogists.
- Whitaker, J. O., Jr. 1963. A study of meadow jumping mouse, *Zapus hudsonius* (Zimmerman), in central New York. Ecological Monographs 33:215-254.
- Whitaker, J. O., Jr. 1972. *Zapus hudsonius*. Mammalian Species 11:1-7.
- White, G. C. and T. M. Shenk. 2000. Relationship of Preble's meadow jumping mouse densities to vegetation cover. Report to the Colorado Division of Wildlife. 17 pp.
- Wisconsin Department of Natural Resources (WI-DNR). undated. Canada Lynx (*Lynx canadensis*). Internet web page: www.dnr.State.wi.us/org/land/er/factsheets/mammals/lynx.htm. 4pp.
- Wolfe, M.L., N.V. Debyle, C.S. Winchell, and T.R. McCabe. 1982. Snowshoe hare cover relationships in northern Utah. J. Wildl. Manage. 46:662-670.
- Wolff, J.O. 1980. The role of habitat patchiness in the population dynamics of snowshoe hares. Ecological Monographs 50:111-130.
- Wright, H.A. and A.W. Bailey. 1980. Fire ecology and prescribed burning in the Great Plains – a research review. USDA Forest Service, General Technical Report INT-77.
- Wunder, B.A. 1998. Water balance and kidney function in Preble's meadow jumping mouse (*Zapus hudsonius preblei*): Inferences from kidney structure. Report submitted to Colorado Division of Wildlife.
- Wyoming Game and Fish Department. 2002. Threatened, Endangered, and Nongame Bird and Mammal Investigations. Nongame Program, Biological Services Section, Wyoming Game and Fish Department. Annual Completion Report. Period Covered: 15 April 2001 to 14 April 2002. Edited by: Andrea O. Cervoski.
- Wyoming Natural Diversity Database. 2002. Yellow-billed cuckoo (*Coccyzus americanus*). University of Wyoming.

- Wyoming Black-Tailed Prairie Dog Working Group. June 15, 2001. Final Draft Wyoming Black-Tailed Prairie Dog Management Plan. Draft. Technical assistance in developing this plan was provided by Martin Grenier, Nongame Mammal Biologist, and Bob Oakleaf, Nongame Coordinator, Wyoming Game and Fish Department Nongame Program.
- Young, David P., Jr.; Erickson, Wallace P.; Gruver, Jeffery C. Investigation of Management and Effects of Structure, Composition and Distribution of Riparian Vegetation on Preble's Meadow Jumping Mouse: 1999 and 2000. Report prepared for U.S. Air Force, F. W. Warren Air Force Base, March 31, 2000.
- _____. 1988. Black-footed Ferret Recovery Plan. U.S. Fish and Wildlife Service, Denver, Colorado. 154pp.
- _____. 1989. Black-footed Ferrets Survey Guidelines.
- _____. 1990. Fish and Wildlife Coordination Act Report for the Jackson Hole Snake River Flood Protection/Levee Maintenance Project, Teton County, Wyoming. Wyoming State Office, Fish and Wildlife Enhancement, Region 6. April 1990. 122pp.
- _____. 1991a. Final Environmental Assessment Black-Footed Ferret Reintroduction Shirley Basin/Medicine Bow, Wyoming. Cooperating agency: Bureau of Land Management, Rawlins, Wyoming (Rawlins District).
- _____. 1991b. Endangered and Threatened Wildlife and Plants: Establishment of a Nonessential Experimental Population of Black-Footed Ferrets in Southeastern Wyoming. 50 CFR Part 17. Federal Register, Vol. 56, No. 162, Wednesday, August 21, 1991, Rules and Regulations, pages 41473-41489.
- _____. 1994. The reintroduction of gray wolves to Yellowstone National Park and central Idaho: Final Environmental Impact Statement. U.S. Fish and Wildlife Service, Denver, CO.
- _____. 1995. Final Rule to Reclassify the Bald Eagle From Endangered to Threatened in all of the Lower 48 States. Federal Register 60(130): 35999-36010.
- _____. 1997. Proposal to List the Preble's Meadow Jumping Mouse as an Endangered Species. 50 CFR Part 17. Federal Register: March 25, 1997 (Volume 62, Number 57), pages 14093-14101.
- _____. 1999a. Proposed Rule to Remove the Bald Eagle in the Lower 48 States From the List of Endangered and Threatened Wildlife. Federal Register 64(128): 36453-36464.
- _____. 1999b. Endangered and Threatened Wildlife and Plants: Proposed Threatened Status for the Mountain Plover. Federal Register 64: (30) 7587-7601.
- _____. 1999c. Mountain Plover Fact Sheet. 3pp.
- _____. 2001. Habitat Destruction Puts Songbird at Risk in the West, News Release 01-94. U.S. Fish and Wildlife Service, California/Nevada Operations Office, Sacramento, CA. 2pp.
- _____. 2002a. Black-footed Ferret Recovery Plan Status Report. March 2002. 46pp.
- _____. March 2002b. Mountain Plover Survey Guidelines. 5pp.
- _____. and Bureau of Land Management (BLM). 1999. [J.R. Hickenbottom, B. Summerfield, J. Aardahl, G. Halekas, M. Hilliard, L. Jackson, D. Prevedel, J. Rupe]. Biological Assessment of the Effects of National Forest Land and Resource Management Plans and Bureau of Land Management Land Use Plans on Canada Lynx. U.S. Forest Service, Ogden, UT. 149pp.
- Unkown. 1980. Age, sex, reproduction, and spatial organization of lynxes colonizing northeastern Minnesota. J. Mammal. 61:261-267.

Unkown. 2000. Supporting information for listing the Western Yellow-billed Cuckoo. Prepared for: Field Supervisor, USFWS, Sacramento Fish and Wildlife Office, 2800 Cottage Way, Rom W-2605, Sacramento, CA.