United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
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January 16, 2007

Memorandum

To: Mark Storzer, Field Manager, Bureau of Land Management, Rawlins Field Office, Rawlins, Wyoming

From: Brian T. Kelly, Field Supervisor, U.S. Fish and Wildlife Service, Wyoming Field Office, Cheyenne /s/ Brian T. Kelly

Subject: Biological Opinion for the Rawlins Resource Management Plan

This correspondence is in response to the U.S. Bureau of Land Management's (BLM or Bureau) request for consultation for the impacts from the U.S. Bureau of Land Management Rawlins Resource Management Plan (RMP) and committed conservation measures to federally listed species in Wyoming in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (50 CFR §402.14). It is expected that those conservation measures presented in the Biological Assessment (BA) but not yet included in the Rawlins RMP will be incorporated into the RMP by either maintenance action or RMP amendment following the completion of this consultation. Your March 17 request for formal consultation was received March 18, 2005. On November 1, 2005, the U.S. Fish and Wildlife Service (Service) notified the Bureau that all information necessary to begin consultation had been received or was otherwise accessible. In December 2005 and January 2006, the Bureau reevaluated and modified some of its effects determinations. On August 2, 2006, the Service received a modified biological assessment (BLM 2006) from the Bureau with adjustments made to the "committed to" conservation measures.

This correspondence addresses potential effects to the bald eagle (*Haliaeetus leucocephalus*), black-footed ferret (*Mustela nigripes*), Preble's meadow jumping mouse (*Zapus hudsonius preblei*) and its designated critical habitat, Canada lynx (*Lynx canadensis*), Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*) and its designated critical habitat, blowout penstemon (*Penstemon haydenii*), Ute Ladies'-tresses orchid (*Spiranthes diluvialis*), Wyoming toad (*Bufo baxteri*), western yellow-billed cuckoo (*Coccyzus americanus*), western boreal toad (*Bufo boreas boreas*), and Platte River and Colorado River downstream listed species and their designated critical habitats from all planned programs of the Rawlins RMP as well as the Bureau's commitment to the Conservation Measures listed in the Rawlins RMP BA and commitments in relevant Programmatic Statewide Species BAs. The planned programs of the Rawlins RMP are (1) Air Quality, (2) Cultural, (3) Fire and Fuels Management, (4) Forest

Management, (5) Lands and Realty, (6) Livestock Management, (7) Minerals, (8) Off-highway vehicle use, (9) Paleontology, (10) Recreation Resources, (11) Special Management Areas, (12) Transportation and Access Management, (13) Vegetation Management, (14) Visual Resource Management, (15) Water Quality, Watershed, and Soils Management, (16) Wildlife and Fish Management, and (17) Wild Horse Management.

This correspondence has two parts -- (1) informal consultation/conference for "no effect" (NE) and "not likely to adversely affect" (NLAA) for effects to listed species and designated critical habitats and "not likely to jeopardize determinations" (NJ) for an experimental non-essential population of the black-footed ferret, and (2) a biological opinion for potential adverse effects from the Fires and Fuels Management, Lands & Realty Management, Livestock Management, Minerals Management, Water quality, Watershed and Soils Management, and Wildlife and Fish Management Programs for listed species in the Rawlins Resource Area.

This correspondence is based primarily on our review of your BA (BLM 2005a, 2006) and supplemental information provided to the Service on August 15 and October 13, 2005, and January 4, May 5, and November 1, 2006. A complete administrative record of all documents and correspondence concerning this consultation are on file in the Wyoming Ecological Services Field Office.

Consultation/Conference History

The Service and the Bureau began informal consultation/conference on impacts of Bureau activities to the bald eagle, black-footed ferret, Preble's meadow jumping mouse, Canada lynx, Colorado butterfly plant, Ute ladies'-tresses, blowout penstemon, Wyoming toad, Platte River and Colorado River downstream listed species in the Rawlins Resource Area on October 23, 2001. Subsequent to this, the Service designated critical habitat for the Preble's meadow jumping mouse and the Colorado butterfly plant. The Service and the Bureau then began consulting on potential effects to designated critical habitats for those two species. The Service provided the Bureau with a most recent list of federally threatened and endangered species potentially present in the Rawlins Resource Area on March 6, 2006.

From October 2001 through September 2005, Service personnel met informally on numerous occasions with Bureau personnel to assist in the completion of the Rawlins BA and reviewed multiple drafts of the BA. The Service received all information necessary to begin formal consultation on this proposed action on October 13, 2005. In December 2005 and January 2006, the Bureau reevaluated and modified some of its effects determinations. An updated draft of the Rawlins BA was received January 4, 2006. The Service provided the Bureau with a draft BO on March 21, 2006. Meetings were held on April 26 and June 22, 2006, between Bureau and Service personnel to discuss the Bureau's comments on that draft BO. The Service received a second modified BA (BLM 2006) from the Bureau on August 2, 2006. In the second modified BA, the Bureau clarified some statements made in the previous BA and also adjusted some of its "committed to" conservation measures. The Service provided the Bureau with a second draft BO on October 6, 2006. On November 1, 2006, the Bureau notified the Service that, except for a few minor points contained in Appendix I of the draft BO, the Bureau biologists concurred with the contents of the draft BO. The Service then began to complete a final version of the BO and Appendices.

Informal Consultation/Conference

In the Rawlins RMP BA, the Bureau made “not likely to adversely affect (NLAA)”, "no effect (NE)", and “is not likely to jeopardize” (NJ) determinations for the effect of certain programs on listed species in the Rawlins Resource Area in Wyoming. These are displayed in Table 1.

Table 1. Listed Species "not likely to adversely affect", "no effect", and “is not likely to jeopardize” determinations made by the Bureau.

Program \ Species/Critical Habitat	Black-footed Ferret (non-reintroduced)	Black-footed Ferret (reintroduced)	Preble's Meadow Jumping Mouse	Preble's Meadow Jumping Mouse Critical Habitat	Canada Lynx	Bald Eagle	Wyoming Toad	Platte River Downstream Species	Colorado River Downstream Species	Blowout Penstemon	Colorado Butterfly Plant	Colorado Butterfly Plant Critical Habitat	Ute Ladies' -tresses
Air Quality	NLAA	NJ	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Cultural	NLAA	NJ	NLAA	NLAA	NLAA	NLAA	NLAA	NE	NE	NLAA	NLAA	NLAA	NLAA
Fire and Fuels Management	NLAA	NJ	-------	-------	NLAA	NLAA	NLAA	------	------	NLAA	NLAA	NLAA	NLAA
Forest Management	NLAA	NJ	NLAA	NLAA	NLAA	NLAA	NE	NE	NE	NE	NE	NE	NE
Lands and Realty	NLAA	NJ	------	------	NLAA	------	NLAA	------	------	NLAA	NLAA	NLAA	NLAA
Livestock Management	NLAA	NJ	------	------	NE	NLAA	NLAA	------	------	------	------	------	------
Minerals	NLAA	NJ	NLAA	NLAA	NLAA	------	NLAA	------	------	NLAA	NLAA	NLAA	NLAA
Off-highway vehicle use	NLAA	NJ	NLAA	NLAA	NLAA	NLAA	NLAA	NE	NE	NLAA	NLAA	NLAA	NLAA
Paleontology	NE	NJ	NLAA	NLAA	NLAA	NLAA	NE	NE	NE	NE	NE	NE	NE
Recreation Resources	NLAA	NJ	NLAA	NLAA	NLAA	NLAA	NLAA	NE	NE	NLAA	NLAA	NLAA	NLAA
Special Management Areas	NLAA	NJ	NE	NE	NLAA	NLAA	NLAA	NE	NE	NLAA	NLAA	NLAA	NLAA
Transportation and Access Management	NLAA	NJ	NLAA	NLAA	NLAA	NLAA	NLAA	NE	NE	NLAA	NLAA	NLAA	NLAA
Vegetation Management	NLAA	NJ	NLAA	NLAA	NLAA	NLAA	NLAA	NE	NE	NLAA	NLAA	NLAA	NLAA
Visual Resource Management	NE	NJ	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Water Quality, Watershed, and Soils Management	NLAA	NJ	------	------	NLAA	NLAA	NLAA	------	------	NLAA	NLAA	NLAA	NLAA
Wildlife and Fish Management	NLAA	NJ	NLAA	NLAA	NLAA	NLAA	NLAA	------	------	NLAA	NLAA	NLAA	NLAA
Wild Horse Management	NLAA	NJ	NE	NE	NE	NLAA	NE	NE	NE	NE	NE	NE	NE

Bald eagle. The BA addressed activities that are not likely to adversely affect the bald eagle. The Service concurs with your determinations that activities described in the Proposed Action with the exception of certain (1) lands and realty actions and (2) minerals management program activities will not likely adversely affect the bald eagle. These two programs may adversely affect bald eagles and as such are the subject of the attached BO. The Service's concurrence with activities that are not likely to adversely affect bald eagles is based on (1) bald eagle known nests are currently restricted to six locations on Bureau-administered lands within the resource area, (2) lack of bald eagle use of communal roost sites within the resource area, and (3) the commitment by the Bureau to implement conservation measures adequate to ensure that if activities did occur in close proximity to bald eagle nesting or roosting areas, the effects from Bureau activities would be sufficiently minimized by protective buffers, etc. (see Appendix I and BLM 2003).

Black-footed ferret. The BA addressed activities that have no effect, are not likely to adversely affect, and are not likely to jeopardize the black-footed ferret. The Bureau has based its

determinations, in part, on the Service's February 2, 2004, letter which informed the Bureau that all black-tailed prairie dog towns and many of the white-tailed prairie dog towns in Wyoming are not likely to be inhabited by black-footed ferrets (USFWS 2004d, 2004e). Additionally, the Rawlins Bureau is committed to maintaining the integrity of prairie dog complexes in habitat suitable for black-footed ferret reintroduction (if such habitat is identified in the Rawlins Resource Area) (BLM 2005b). Furthermore, the Bureau has committed to other conservation measures designed to protect black-footed ferrets and their habitat (see Appendix I). Based on this information, the Service concurs with your determinations that activities described in the Proposed Action will either have no effect or are not likely to adversely affect non-reintroduced black-footed ferrets. In addition, the Service also concurs with your determination that activities authorized under the Rawlins RMP that may affect the experimental non-essential population of black-footed ferrets in the Shirley Basin of Wyoming will not likely jeopardize the continued existence of the species. The Service's concurrence is based on the fact that, by definition, any effects to an experimental non-essential population of any species will not jeopardize the continued existence of the species. Additionally, the Bureau has committed to conservation measures and adopted best management practices that will aid in the recovery of this species. This species will not be discussed further in this correspondence.

Preble's meadow jumping mouse and its designated critical habitat. The BA addressed activities that are not likely to adversely affect the Preble's meadow jumping mouse and its critical habitat. The Service concurs with your determinations that activities described in the Proposed Action with the exception of certain (1) lands and realty actions and (2) livestock management actions, will not likely adversely affect the Preble's meadow jumping mouse and its designated critical habitat. These two programs identified above may adversely affect the Preble's meadow jumping mouse and its designated critical habitat and as such are the subject of the attached BO. The Service's concurrence with activities that are not likely to adversely affect the Preble's meadow jumping mouse is based on (1) the limited Preble's meadow jumping mouse habitat managed by the Bureau, (2) the absence of designated critical habitat for the Preble's meadow jumping mouse managed by the Bureau, and (3) the commitment by the Bureau to implement conservation measures adequate to ensure that if disruptive activities did occur in Preble's meadow jumping mouse habitat, the effects from Bureau activities, with the exception of those activities mentioned above, would be sufficiently minimized by protective buffers, timing restrictions, etc. (see Appendix I).

Canada lynx. The BA addressed activities that are not likely to adversely affect the Canada lynx. The Service concurs with your determinations that activities described in the Proposed Action will not likely adversely affect the Canada lynx. The Service's concurrence is based on the Bureau's review of suitable lynx habitat within the Rawlins Resource Area that found that there are no areas of likely Canada lynx habitation (Lynx Analysis Units) on lands administered by the Bureau within this resource area. This species will not be discussed further in this correspondence.

Colorado butterfly plant and its designated critical habitat, Ute ladies'-tresses orchid, and blowout penstemon. The BA addressed activities that are not likely to adversely affect the Colorado butterfly plant and its designated critical habitat, Ute ladies'-tresses orchid, and blowout penstemon. The Service concurs with your determinations that activities described in the Proposed Action with the exception of certain livestock grazing activities will not likely adversely affect these plants and the designated critical habitat of the Colorado butterfly plant. The livestock grazing program may adversely affect the Colorado butterfly plant and its

designated critical habitat, Ute ladies'-tresses orchid, and the blowout penstemon and as such is the subject of the attached BO. The Service's concurrence for activities not likely to adversely affect these species is based on the (1) limited habitat (blowout penstemon) or no known occupied habitat (Ute ladies'-tresses and Colorado butterfly plant) managed by the Bureau's office in Rawlins, and (2) the commitment by the Bureau to implement conservation measures adequate to ensure that if adverse activities with the exception of certain activities of the livestock grazing program did occur in the habitat of these listed plants, the effects from Bureau activities would be sufficiently minimized by protective buffers, timing restrictions, etc. (see Appendix I).

Wyoming toad. The BA addressed activities that are not likely to adversely affect or will have no effect on the Wyoming toad. The Service concurs with your determinations that activities described in the Proposed Action will have no effect or will not likely adversely affect this species. The Service's concurrence is based on (1) the absence of occupied Wyoming toad habitat managed by the Bureau, and (2) the commitment by the Bureau to implement conservation measures adequate to ensure that if Bureau-authorized activities were to occur in Wyoming toad habitat, then the effects from those activities would be sufficiently minimized by protective buffers, timing restrictions, etc. (see Appendix I). This species will not be discussed further in this correspondence.

Platte River and Colorado River downstream listed species. The BA also addressed activities that are expected to have no effect to downstream listed species of the Platte River and Colorado River systems. The Service concurs with your determinations that activities described in the Proposed Action, with the exception of certain (1) fire and fuels management actions, (2) lands and realty management actions, (3) livestock management, (4) minerals management actions, (5) water quality, watershed and soils management actions, and (6) wildlife and fish management actions will have no effect on the downstream listed species of the Platte River and Colorado River systems because water depletions are not expected to occur in conjunction with those authorized activities. The five programs identified above may adversely affect Platte River and Colorado downstream listed species and as such are discussed in the attached BO.

Western boreal toad and western yellow-billed cuckoo. The Bureau's biological assessment also made effects determinations and commitments to conservation measures for the western boreal toad and the western yellow-billed cuckoo. The western yellow-billed cuckoo remains on the Service's listing of candidate species for listing, however, the western boreal toad was recently removed from consideration for listing. Although the Service does not provide concurrence with determinations of effect to species which are candidates for listing, we have reviewed your determinations for the western yellow-billed cuckoo and the western boreal toad and appreciate your efforts in providing a proactive analysis, subsequent determinations, and commitments to conservation measures. Your conservation measures should serve to better protect these species from further decline and may help to reduce the need to list these species in the future. These species will not be discussed further in this correspondence.

The attached BO discusses potential adverse effects from the (1) Lands and Realty Program and Minerals Management Program to the bald eagle, (2) Lands and Realty Program and Livestock Management Program to the Preble's meadow jumping mouse and its designated critical habitat, and (3) Livestock Grazing Program to the Colorado butterfly plant and its designated critical habitat, Ute ladies'-tresses orchid, and the blowout penstemon. In addition, the attached BO discusses potential adverse effects from the Fire and Fuels Program; Lands and Realty Program;

Livestock Management Program; Minerals Management Program; Water Quality, Watershed and Soils Management Program; and Wildlife and Fish Management Program to downstream listed species of the Platte River and Colorado River systems.

PROGRAMMATIC BIOLOGICAL OPINION

FOR THE WYOMING BUREAU OF LAND MANAGEMENT'S

RAWLINS RESOURCE MANAGEMENT PLAN

U.S. Fish and Wildlife Service
Wyoming Ecological Services Office
Cheyenne, Wyoming

January 2007

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PROGRAMMATIC BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed action examined in this consultation is the management according to the revised Rawlins Resource Management Plan (RMP) as well as the U.S. Bureau of Land Management's (Bureau) commitment to conservation measures listed in the Biological Assessment (BA) (BLM 2006). These are identified in Appendix I. RMPs are used by the Bureau to guide and control future actions and set standards upon which future decisions on site-specific activities are based. RMPs only establish general management policy on a broad scale. RMPs are not used to make decisions that commit resources on a small scale such as on specific parcels of land. RMPs also identify desired outcomes, also known as "desired future conditions". These outcomes are expressed in RMPs as goals, standards, objectives, and allowable uses and actions needed to achieve desired outcomes. These are often referred to as RMP decisions or resource allocations. It is upon the RMP decisions or resource allocations of the revised Rawlins RMP and Bureau-committed conservation measures that the effects determinations in this Biological Opinion (BO) are based.

The Record of Decision (ROD) for the existing Great Divide RMP (the predecessor to the Rawlins RMP) was signed by the Wyoming Bureau State Director on November 8, 1990. The Great Divide RMP provided guidance and direction for management of Bureau-administered public land surface and federal mineral estate. On July 5, 2001, an evaluation of the Great Divide RMP was completed. The evaluation found the Great Divide RMP (BLM 1990) 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 Rawlins Bureau decided that the Great Divide RMP required modification.

The objective of the Rawlins RMP is to provide specific management direction to prevent or address potential conflicts among oil and gas development, recreational activities, livestock management, important wildlife habitat, and other important land and resource uses in the Rawlins Resource Area, as well as to determine the appropriate levels and timing of these activities. Decisions made as a result of the ROD for the Rawlins RMP will result in amending the existing Great Divide RMP (BLM 1990).

This formal consultation only addresses adverse effects to listed species which are likely-to-occur as a result of the Rawlins RMP (1) Lands and Realty Program, (2) Minerals Management Program, (3) Livestock Management Program, (4) Fire and Fuels Program, (5) Water Quality, Watershed and Soils Management Program, and (6) Wildlife and Fish Management Program as of the date of this BO.

The Rawlins RMP incorporates current laws and regulations and public land resource management initiatives to guide long-range land management decisions for public lands and resources in Albany, Carbon, Laramie, and Sweetwater counties in south-central Wyoming covering approximately 11.2 million acres. The Bureau administers about 3.4 million acres of surface and mineral estate, 100,000 acres of pubic land surface where the mineral estate is state or privately owned, and 1.2 million acres of "split-estate" lands -- federal mineral estate where the surface is privately owned or state-owned. The Rawlins RMP does not include land management decisions where land surfaces and minerals are both privately owned, or owned by

the State of Wyoming, or local governments, or those lands that are managed by other federal agencies.

A description of activities of the Rawlins RMP that may affect, and are likely to adversely affect, the bald eagle (*Haliaeetus leucocephalus*), the Preble's meadow jumping mouse (*Zapus hudsonius preblei*) and its designated critical habitat, the Colorado butterfly plant (*Gaura neomexicana* ssp. c*oloradensis*) and its designated critical habitat, the Ute ladies'-tresses orchid (*Spiranthes diluvialis*), the blowout penstemon (*penstemon haydenii*), and the Platte River and Colorado River downstream listed species and their designated critical habitats is contained in the Rawlins BA (BLM 2006) and is described below.

Description of Activities Described under the Rawlins RMP that may affect and are likely to adversely affect listed species

The following discussion describes the Wyoming Rawlins Fires and Fuels Management; Lands and Realty Management; Livestock Management; Minerals Management; Water Quality, Watershed and Soils Management; and Wildlife and Fish Management programs which may have potential adverse effects to the bald eagle, the Preble's meadow jumping mouse (Preble's) and its designated critical habitat, the Colorado butterfly plant and its designated critical habitat, the Ute ladies'-tresses orchid, the blowout penstemon, and the Platte River and Colorado River downstream listed species and their designated critical habitats. Conservation measures were included in the Rawlins BA (BLM 2006) to address potential adverse effects. The Bureau has committed to implementing the conservation measures listed in that conservation strategy as part of their proposed action (RMP) (see Appendix I), therefore, the Service has evaluated the implementation of these conservation measures as part of the proposed action.

Program \ Species/Critical Habitat	Preble's Meadow Jumping Mouse	Preble's Meadow Jumping Mouse Critical Habitat	Bald Eagle	Platte River Downstream Species and Critical Habitat	Colorado River Downstream Species and Critical Habitat	Blowout Penstemon	Colorado Butterfly Plant	Colorado Butterfly Plant Critical Habitat	Ute Ladies' -tresses
Fire and Fuels Management	-------	-------	--------	LAA	LAA	--------	--------	--------	--------
Lands and Realty	LAA	LAA	LAA	LAA	LAA	--------	--------	--------	--------
Livestock Management	LAA	LAA	--------	LAA	LAA	LAA	LAA	LAA	LAA
Minerals	-------	-------	LAA	LAA	LAA	--------	--------	--------	--------
Water Quality, Watershed and Soils Management	--------	-------	--------	LAA	LAA	--------	--------	--------	--------
Wildlife and Fish Management	--------	--------	-------	LAA	LAA	--------	--------	--------	--------

Fire and Fuels Management

The objectives of fire management are to restore the natural role of fire in the ecosystem, and to protect life, property, and resource values from wildfire. The two major activities involved with the Bureau's fire management activities are prescribed burning and wildfire suppression.

Prescribed fire objectives are to restore natural fire regimes and enhance rangeland habitats for livestock and wildlife. The prescribed fire program authorizes fire plans, firebreaks, prescribed

burns, and coordination with necessary parties on a case-by-case basis. Some prescribed fires are conducted to dispose of slash and residue from timber sales, improve wildlife habitat and grazing potential, or to reduce hazardous fuel loads.

Wildfires threatening higher resource values, including commercial timber areas, developed recreation sites, and areas of wildland/urban interface, or fires with potential to spread to private, state, or other federal lands are suppressed. Fire suppression activities vary with the intensity of the wildfire and are conducted on an emergency basis. Fire lines are constructed to contain the wildfire. Water is withdrawn from nearby sources to suppress fires. Chemical fire suppression agents containing chemical dyes may be used, if needed. The use of aerial fire retardant is restricted near water resources. After a fire is extinguished, the Bureau may use rehabilitation techniques to restore a burned or suppression area to its previous vegetative cover.

Activities authorized by this program include tree thinning, construction of roads and fire lines, application of fire-suppressing chemicals by hand and aerial application, and revegetation and mulching stream banks for rehabilitation. Activities often employ the use of off-road vehicles, hand tools, and heavy equipment such as bulldozers.

The fire damage restoration program proposes the Bureau use a technique called Analysis of Burned Area Emergency Rehabilitation (BAER) on all areas damaged by fire. This technique is used to evaluate the impact of restoration efforts on the ecosystems involved.

Lands & Realty Management

The objective of the Lands and Realty Management Program is to support multiple-use management goals of the Bureau resource programs; respond to public requests for land use authorizations, sales, and exchanges; and acquire and designate rights-of-way access to serve administrative and public needs.

Public land tracts not critical to current management objectives will be disposed of through the realty management program. Non-federal lands may be acquired through exchange in areas with potential for recreation development or in areas containing important wildlife, cultural, scenic, natural, open space, or other resource values. Protective withdrawals may be established to protect and preserve important resource values, but require extensive mineral investigations.

Realty management authorizes occupancy of public lands for roads, power lines, pipelines, communication sites, and irrigation ditches authorized by granting a right-of-way. Rights-of-way management actions respond to public requests for access, land authorizations, sales, and exchanges. These rights-of-way may be temporary or extend two years or longer. If restricted types of rights of way are required in avoidance areas or when such areas cannot reasonably be avoided, the adverse effects of construction will be intensively mitigated in these areas.

The program 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, considers new withdrawals, and leases acres for landfills.

Access management activities are generally in support of other resource management programs and are authorized under the Lands and Realty Management Program. The Bureau rehabilitates

access roads that are no longer needed, proposes easement negotiations, pursues access across private lands, acquires rights-of-way or easements, and exchanges lands.

Cases are considered individually in mineral exchanges. Public lands can be considered for sale or disposal on a case-by-case basis when a definite need for the land is identified and the proposal meets the requirements of the Recreation and Public Purpose (R&PP) Act and local land use plans. Leasing public lands for landfills is allowed under the R&PP Act, and sanitary landfilling is a common method of solid waste disposal.

Livestock Grazing Management

The livestock management objective for the Rawlins Resource Area is to maintain or improve forage production and range condition and to provide a sustainable resource base for livestock grazing on public lands while improving wildlife habitat and watershed conditions (BLM 2006). Grazing is authorized on 3,394,338 acres of Bureau-administered lands in the Rawlins Resource Area. There are 582 grazing allotments in the Rawlins Resource Area. Grazing allotments in the Rawlins Resource Area are administered according to the Taylor Grazing Act of 1934.

A typical grazing parcel on Bureau-administered land within the Rawlins Resource Area would be permitted on a yearlong use basis with the amount of allowable forage identified as Animal Unit Months of use or AUM's. The livestock operator may, with concurrence from the Bureau, change the use pattern from year to year to compliment healthy rangelands, depending on the available forage, condition of the pasture and weather conditions, or to achieve pre-determined management goals. Livestock grazing patterns are found in Table 2. Permits are normally issued for a 10-year period. If Bureau personnel identify a need for specific management or a change in the current pattern of use it can be stipulated on the permit when it is re-authorized. Cattle are the predominant class of livestock grazed on Bureau-administered lands in the Rawlins Resource Area, however, sheep, horses and bison are also authorized.

In some cases, cross-fencing (subdividing an allotment, pasture, or ranch with fence) is used to accomplish management needs or when a parcel is leased by more than one lessee. Temporary fencing, including electric fencing may be authorized to accomplish management goals. Fencing might be used to reduce grazing intensity or distribute grazing away from important resources (streams, springs, riparian areas, wetlands, cottonwood galleries, rehabilitation areas, etc.). When fencing is proposed, either permanent or temporary, fences are built to standards developed in the Bureau's Fencing Handbook (see BLM 2005a). These standards are required to reduce the amount of restriction or hazards to wildlife. Fence construction and maintenance would likely require access to the site, possible removal of vegetation or uneven surface materials (rocks, trees, sand, etc.), stringing wire, digging postholes, building fence braces, building rock jacks, cutting or removing on or off site building materials (fence posts, rails, gathering rocks, etc.), weed management (spraying, cutting, pulling, etc.), or if the project is large enough, the possibility of camps for workers. The use of corrals for confinement of livestock for various purposes (sheep shearing, overnight holding of livestock, etc.) requires construction and maintenance activities including, hauling building materials, heavy equipment use, access to the corral site, etc.

The livestock grazing program may also include rangeland improvements such as stock water ponds, pits, or reservoirs; pipeline and trough systems; spring developments; storage tanks and troughs; wells; or temporary tanks and water hauling. These off-stream water improvements

better distribute the use and intensity of use by livestock away from streams, rivers or wetlands and help protect important riparian areas and could require the use of hand tools, mechanical or heavy equipment, hauling/transporting of materials (gravel, dirt, tanks, etc.), and clearing of vegetation. Placement of salt and mineral blocks or riding horseback and physically moving livestock are other forms of livestock distribution.

Table 2. Livestock Grazing Patterns (BLM 2004)

Pattern of Use	Description
Yearlong	When livestock are retained in a pasture throughout the plant growing season or the pasture or allotment is grazed in the same manner continuously throughout the year, each year.
Seasonal	Livestock are grazed in various seasons, i.e.; spring/summer/fall, spring/fall, winter, spring, summer, fall, or any combination, but not the entire year.
Rested	Stipulates that a pasture is not grazed at all in a given year, not even the mature forage is grazed. Usually the rested pasture is managed in conjunction with a rotational grazing system.
Rotational	Involves a multi-pasture system, where livestock are moved from one pasture to another on a scheduled basis. A sub-set of this system is to graze a pasture for short duration with a large number of livestock then rest the pasture (short-duration pattern, high intensity).
Deferred	Specifies that a pasture is not grazed until seed maturity is assured or a comparable growth stage has been reached and that grazing occurs after seed maturity.

Rangeland restoration to improve range health is also a part of livestock management. These activities might include aerial seeding and possibly herbicide application, seeding by disking or drilling (using a tractor or other heavy equipment), fertilizing, plowing, chaining, or rangeland pitting.

Most livestock operators use off-highway vehicles (OHVs) (pick-up trucks, 4-wheelers, motorcycles), ride horseback, or walk to access their allotments. "Herding " (moving) livestock by walking, horseback riding, and the use of dogs to distribute livestock on allotments or trailing (move them from one location to another - on or off of allotments), and the use of domestic sheep bed grounds (a temporary site to bed down flock(s) of sheep) and associated sheep herder camps are commonly employed methods of livestock operations. Road construction and maintenance, for access to various livestock operations, would again require heavy equipment use, possible mechanical vegetation removal or spraying with herbicides, and material hauling. Road construction may be authorized in conjunction with projects such as a livestock watering facilities. If proposed, road and water facility construction requires surveys for listed species prior to approval if the project is proposed in suitable habitat.

An environmental assessment is prepared prior to issuing new grazing leases, surface disturbing activities, and range improvement projects. Allotments are monitored by Bureau range specialists and changes in use are developed if resource conditions warrant such a change. In extreme situations such as extended drought, permits may be placed in a reduced use or non-use status until conditions improve. These specific permit issuances are subject to separate consultation under the Act.

Bureau-administered surface lands in the Rawlins Resource Area are managed to achieve the four fundamentals of rangeland health outlined in grazing regulations (43 CFR 4180.1) which are (1) watersheds are functioning properly; (2) water, nutrients and energy are cycling properly; (3) water quality meets State standards; and (4) habitat for special status species is protected. A complete discussion can be found in the Approved Resource Management Plan, Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for Public lands Administered by the Bureau of Land Management in the State of Wyoming (see Appendix 2 of BLM 2004). Monitoring of riparian/wetland areas by interdisciplinary teams using the proper functioning condition (PFC) methodology is how the Bureau determines whether a given watershed is functioning properly. This would entail the use of a team of interdisciplinary personnel (generally 2-5 personnel) to assess the condition of the riparian/wetland habitat within a given allotment.

Minerals Management

The lands administered by the Wyoming Bureau contain some of the most prolific oil, gas, coal and trona producing areas in the Rocky Mountain region. Mineral development is subject to leasing, location, or sale based on Federal mineral law (such as the Mineral Leasing Acts and amendments) covering that particular commodity. Conditions under which the development of these minerals can occur are determined through land use planning.

The objective of minerals management actions is to make public lands and federal mineral estate available for orderly and efficient development of mineral resources. The Bureau's mineral program is divided into salable minerals, leasable minerals and locatable minerals.

Salable Minerals

Deposits of salable minerals are scattered throughout Wyoming. Salable minerals include common varieties of sand, gravel, sandstone, shale, limestone, dolomite, and granite rock. Historical use of these materials includes building materials, road surfaces, and tools. Today salable minerals are mainly used for maintaining roads on public lands and also for activities associated with the oil and gas industry.

The Bureau provides sand, gravel, and stone from federal mineral deposits as necessary to meet the needs of federal, state, and local road construction and maintenance projects in the planning areas. Before issuing contracts or free use permits for salable minerals, the Bureau conducts the appropriate environmental analyses including special studies or inventories of cultural values, threatened or endangered plant and wildlife species, and other resources. Stipulations or conditions may be included in the terms of the contract to ensure protection of the natural resources present and reclamation of the land following project completion. Sand and gravel, scoria, flagstone, moss rock, and other minerals are available for free use or sale but are subject to conditions and stipulations developed on a case-by-case basis.

Site reclamation is required following any surface disturbing activity by mining for salable minerals. Reclamation includes removing all surface debris, recontouring, reducing steep slopes, and planting vegetation. All reclamation proposals must conform to State agency requirements and must be approved by the Bureau. Salable minerals are disposed of under the Materials Act of 1947, as amended, and are discretionary actions.

Leasable Minerals

Leasable minerals include fluid (oil, gas, geothermal) and solid minerals such as coal, trona, and phosphate. Bentonite and uranium are leasable on acquired lands.

Current use of coal is primarily for generation of electricity. Coal in Wyoming is most generally extracted using surface mining methods although in the past some coal was mined underground. The underground mining method is proposed for some future operations. Surface mining requires a federal coal lease from the Bureau, mining permits from the State, mine plans approved by the Office of Surface Mining (OSM). Surface mining involves the use of large equipment such as draglines, shovels, haul trucks, etc. Small drill rigs are used for exploration to determine the location, thickness, and to obtain core samples (for determining quality). Extracting coal using surface mining methods often results in large areas of surface disturbance from road construction, removal of topsoil and overburden, and stock piling of these materials. Once an area is mined, reclamation begins and includes recontouring as closely to the original landscape as possible, the reconstruction of drainages, reseeding and monitoring to assure that habitat is useable. Coal is leased under the Mineral Leasing Act of 1920 and the Federal Coal Leasing Amendments Act of 1976.

Current uses of trona include baking soda, paints, glass, toothpaste, soaps, ceramic tiles, porcelain fixtures, paper, water softeners and pharmaceuticals. Wyoming is the largest producer of trona in this country and has the largest known reserve of trona in the world. Trona is generally mined underground with the long wall mining method. Surface facilities are generally processing plants, offices, and maintenance buildings along with associated roads.

Current uses of uranium are as (1) nuclear fuel for generation of electricity, (2) nuclear explosive, (3) medicine, (4) diagnostic tools, to detect welding problems, in the manufacture of steel products, or (5) used to reduce the spoilage of certain foods. Uranium is generally categorized as a "locatable mineral" but is considered "leasable" on "acquired lands". Surface facilities include processing plants, equipment maintenance buildings and Bureau-administered offices.

Leasable bentonite also occurs on acquired lands. Bentonite is surface-mined with shovels and hauled with trucks. Drilling is used to locate the bentonite. Large areas of surface disturbance occur through removal of the overburden, overburden stockpiles, surface facilities and roads. Surface facilities include processing plants, equipment maintenance buildings, and offices.

Fluid leasable minerals include oil, gas, and geothermal steam. Leasing of oil and gas resources is under the authority of the Mineral Leasing Act of 1920, as amended. Leasing is administered by the Bureau through a competitive and non-competitive system. The Bureau receives nominations of lands to be put up for sale at bimonthly competitive oil and gas sales. These nominations are gathered together into a parcel list and are sent to the respective field offices for the attachment of stipulations. These stipulations are derived from the respective Land Use Plans. The parcel lists are returned to the state office and once verified are put together into a "Notice of competitive oil and gas sale" booklet. This Notice must be posted for the public for 45 days before the lease sale is held. Once the parcel is sold, it is then issued into a lease.

Initial exploration for oil and gas resources is often conducted using geophysical methods. Geophysical exploration involves the use of ATVs and vehicles to lay the geophones, drill the

shot holes for charges, or as "thumpers" to create the sound wave instead of using charges and then the removal of the geophones and reclamation of shot holes if used. Exploration for oil and gas (including coal bed natural gas) may also include the drilling of one or more wells to test the reservoir and its productive viability. During the exploration phase of drilling, surface disturbing activities include the construction of roads, well pads, reserve pits, and other facilities.

Development of oil and gas fields includes construction of the same types of facilities used during exploration, but in addition it may be necessary to obtain federal rights of way for product pipelines and power lines. Other surface uses associated with oil and gas development include construction of storage tank batteries and facilities to separate oil, gas and water. Compressor engines (gas powered or electric) may be required to move gas to a pipeline, and diesel, gas, or electric pumps and other related equipment may be needed to lift the oil, gas, or water from the well to the ground surface. Generally, there are an average of three acres for each drill site, one mile of road and one mile of pipeline for each drill site. This can vary widely with each project. Directional drilling requires a bigger pad than one well. Size is dependent on the number of wells drilled from each pad.

Water is often produced concurrently with oil and gas production and disposal methods can range from subsurface re-injection to direct surface discharge to discharge into a containment pond or pit. Some fields may have large volumes of water or very little water. Water that cannot be discharged to the surface because of its chemical makeup may be treated before surface discharge or may be reinjected. Roads may be two track unimproved roads to crown and ditched roads designed by an engineer. One day to over a month may be required to drill the well depending on the type of well (vertical or directional), depth and types of rocks encountered. Reclamation involves reseeding and the recontouring of unneeded roads and unneeded portions of the well pads.

Geothermal resources are available for exploration, development, and production and are subject to the same surface disturbing and other restrictions applied to oil and gas exploration, development and production. Similar to oil and gas leasing, the Bureau administers geothermal leases through a competitive and non-competitive system. The Geothermal Steam Act of 1970 authorizes leasing.

Locatable Minerals

Locatable minerals include gypsum, silver, gold, platinum, cobalt and other precious and base minerals. Bentonite and uranium are also locatable except on acquired lands.

Minerals are locatable under the 1872 Mining Law. Most public lands are open to location with the exception of withdrawn lands. The Mining Law of 1872 sets the requirements for lode claims, placer claims, and mill sites as well as discovery, location, annual filings, assessment work, and mineral examinations to establish validity.

Water Quality, Watershed, and Soils Management

The Bureau 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 handtools.

The Bureau watershed management activities include evaluating proposed projects, applying soil management practices, applying seasonal closures, monitoring public drinking water, and completing groundwater studies. Some of these field activities involve the use of heavy machinery and handtools. Field activities can involve developing riparian/wetland exclosures; constructing stream crossings that allow for appropriate sediment and flow passage; practicing stream improvement practices, such as increasing sinuosity in channels by using handtools to construct natural structures that include rock or other natural materials; constructing artificial instream structures using heavy equipment, steel, geotextile 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, power lines, 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 Rawlins Resource Area mainly are in support of other programs. Through water resource management, the Bureau 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 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 Bureau develops pollution prevention plans; ensures that 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 Bureau also provides technical expertise on other activities, such as livestock ponds and waterfowl monitoring activities, and provides impact analyses of oil and gas development or any surface disturbance projects. The Bureau provides technical expertise in reestablishing floodplains, iron mines, and contoured railroad grades. The Bureau 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 & Fish Management

The objectives of wildlife habitat management are to maintain the biological diversity of plant and animal species; support the strategic plan population objective levels of the Wyoming Game & Fish Department (WGFD) to the extent practical and to the extent consistent with Bureau multiple-use management requirements; maintain and, where possible, improve forage production and quality of rangelands, fisheries, and wildlife habitat; and, to the extent possible, provide habitat for threatened and endangered and special status plant and animal species on all public lands in compliance with the Endangered Species Act and approved recovery plans.

Approximately 90 percent of wildlife program activities are in support of other resource programs such as fuels reductions, density of timber stands in deer and elk winter habitats, oil and gas exploration, timber harvest, or prescribed fires. Specific management goals and actions are for several wildlife groups and habitats including big game ranges, wetland and riparian areas, elk habitat, raptor and grouse breeding areas, and animal and insect damage control.

Wildlife management maintains and, where possible, improves forage productions and quality of rangelands, fisheries, and wildlife habitat, and provides habitat for threatened, endangered, and special status animal and plant species on Bureau-administered public land surface in compliance with the Endangered Species Act and approved recovery plans.

Big game and fisheries management levels identified in the WGFD 1990-1995 strategic plan are supported by the Bureau. The Bureau cooperates with the WGFD in introducing or reintroducing native and acceptable non-native wildlife and fish where potential habitat exists. Wildlife habitat is monitored and population adjustments and habitat improvements are recommended to the WGFD, as appropriate. The Bureau works with the U.S. Fish and Wildlife Service and the WGFD in evaluating and designating critical habitat for threatened and endangered species on Bureau-administered public lands.

Wildlife program projects may include surveying, monitoring, habitat improvement activities such as developing habitat management plans, and creating cooperative management areas. Categories of wildlife management activities for the Bureau include developing stipulations and protective measures, acquiring land, conducting inventories, performing livestock or forestry-related activities, and wildlife and fisheries habitat improvement projects.

The Bureau develops stipulations and protective measures to enhance wildlife and fisheries habitat. These include authorizing withdrawals of some areas from mineral entry; limiting access of four-wheel drives, snowmobiles, horseback, and pedestrians; prohibiting surface development; and imposing road closures. The Bureau may acquire riverfront land or easements, and conduct inventories of potential habitat and occurrences of threatened, endangered, and sensitive species.

Livestock-related wildlife management activities include 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 the improvement of range with mechanical treatment. Forestry-related wildlife management activities include the management of timber and the promotion of cutting, thinning, planting, seeding, and pitting.

Other wildlife management activities for terrestrial species include introducing species, monitoring habitat, fencing modifications for antelope passage, implementing public use closures for wintering elk, development of water areas for waterfowl and waterbirds, recommending habitat improvement projects, treatment to control exotic plants, prescribed burns, meadow restoration, cabling of junipers, changing types of grazing and season of grazing, prescribed burning, developing islands, allowing farming, managing accesses, authorizing agricultural entry and disposal, and using surface protection mitigations.

Other wildlife management activities for aquatic species include establishing a baseline fisheries inventory, fish habitat improvement, bank stabilization, development of watering sources, modification of barrier fences, exotic fish removal, construction of instream barriers to protect species from non-native invaders, installation of revetments and fish passage structures, installation of log overpours, macroinvertebrate sampling and analysis, installing gabion baskets, and placement of large boulders for instream fish habitat.

STATUS OF THE SPECIES'

Bald Eagle Species Description

The bald eagle (*Haliaeetus leucocephalus*) is a large diurnal raptor. Adult bald eagles have a white head and tail plumage and very dark brown to black wing and body plumage. The bill and cere are bright yellow as are the lower legs and talons. Juveniles are often misidentified as golden eagles, as they have primarily brown plumage (including head and tail), bill, and eyes. Bald eagles attain adult plumage at about 5 years of age. The bald eagle has a wing span up to 7 and a half feet wide and weighs between 8 and 14 pounds. Females are larger than males.

Bald Eagle Life History

Present-day breeding occurs primarily in northern California, Alaska, Oregon, Washington, Minnesota, Wisconsin, Michigan, Maine, the Chesapeake Bay area, Florida, the tri-state corner of Idaho, Montana, and Wyoming, and in parts of Canada. The Service estimated the breeding population exceeded 5,748 occupied breeding areas in 1998 (United States Fish and Wildlife Service (USFWS) 1999c).

Bald eagles are migratory and may live more than 30 years in the wild. They are monogamous and build nests that may be reused and built upon year after year, sometimes producing nests 10 feet in diameter. Bald eagles have no more than one brood per year, laying 1 to 3 eggs. Their incubation period lasts about 35 days. The eggs are incubated by both male and female birds (Stalmaster 1987). Nestlings may out-compete siblings for food and push them out of the nest. Usually 1 or 2 eaglets are produced per pair annually. Fledglings leave the nest approximately 75 days after hatching. After the breeding season, bald eagles congregate where food is plentiful, and they may continue to roost near the nest tree.

Bald eagles inhabit primarily riparian habitats in cottonwood groves and coniferous forests. Bald eagles primarily feed on fish, but also on small mammals and carrion. In Wyoming, where water is scarce, bald eagles are found nesting away from water sources and will often feed on carrion: road kill, hunting gut piles, and winter kill. They are also known to be kleptoparasitic, stealing prey from other raptors.

Nesting Habitat. Bald eagles typically nest in forested areas adjacent to large bodies of water. Nests are most often constructed in the tops of large trees (Howell 1937, Murphy 1965) but can occur on cliffs or on the ground in treeless areas (Troyer and Hensel 1965). Besides the distance to the nearest water, other features that influence nest location can include: diversity, abundance, and vulnerability of prey base; and absence of human development and disturbance (Buehler 2000). In Wyoming, mature cottonwood groves found along streams and rivers are typically used as bald eagle nesting habitat. Nest locations usually provide proximity to a food source, good visibility from the nest, and a clear flight path to the nest (Herrick 1924).

One study showed that bald eagles in the Greater Yellowstone Ecosystem were flexible in their selection of nest sites, as long as a dependable food source was available in early spring (Swenson *et al.* 1986). Once this criterion was met, they tended to select the most desirable trees available (Swenson *et al.* 1986).

One of the most important characteristics of bald eagle nesting habitat is an open forest structure (Anthony *et al.* 1982). The use of dominant nest trees in forest stands with openings and edges is widespread. One breeding territory in Ohio was occupied for nearly a century (Herrick 1924). Often several alternate nests are built by one pair in a breeding territory, and in any given year, a new nest may be built or an old nest may be reoccupied [Greater Yellowstone Bald Eagle Working Group (GYBEWG) 1996].

Human Disturbance. Freedom from human disturbance is a highly important criteria for successful nesting. Breeding eagles are more sensitive to disturbance than non-breeding or wintering birds, and the early stages of the breeding cycle (nest repair, egg laying, and incubation) are the most sensitive times [Mathisen 1968, Weekes 1974, GYBEWG 1996, Montana Bald Eagle Working Group (MBEWG 1994)]. Eagles are more likely to abandon a nest early in the season before a bond is established or young hatch. The vulnerability of eggs or young to adverse weather if adults are flushed from a nest is also most critical in the early stages of nesting. Human disturbances, however, may still be problematic later in the season and result in premature fledging (Grier 1969).

Apparent changes in the numbers of eagles using traditional wintering areas may also be related to increased human disturbance (Fitzner and Hanson 1979). For example, eagles along the North Platte River in Wyoming were never observed by Reclamation biologists within the city limits of Casper, Glenrock, Douglas, or Torrington despite the presence of adequate perches along the river in these areas and the relatively dense populations of eagles four miles on either side of these towns (USBR 1981). The stretches of river passing through these towns corresponds to the "high human activity" category of Stalmaster and Newman (1978) and low eagle activity in such areas is in accordance with their observations. Eagles were also found to be less likely to be observed in areas where fishermen congregated (USBR 1981). This was particularly evident along the Miracle Mile section of the North Platte River between Kortes and Pathfinder Reservoirs where eagles often perched along the river when roads were snow covered and fishermen were absent, but rarely perched in the area when fishermen could get to the river. On Pathfinder Reservoir, eagles congregated on the western shore or on the Sweetwater Arm when fishermen were present along the more accessible eastern shore. Bald eagles have been found to habituate to human disturbance with highway traffic being the least disturbing (GYBEWG 1996).

Winter Habitat. On their winter range, bald eagles may roost singly or in small groups but larger communal roosts are important and may predominate in many areas (Platt 1976). Communal roosting may have developed as information centers in response to the distribution of foods (Ward and Zehavi 1973). By congregating with other birds, an individual eagle may enhance its chances of finding unevenly distributed food supplies. Communal roosts usually are located in stands of mature old growth conifers or cottonwoods, and roosts may be several miles from feeding areas. Wintering bald eagles occur throughout the United States but are most abundant in the West and Midwest (USFWS 1983) along major river systems and large bodies of water in the mid-western states, Chesapeake Bay region, Pacific Northwestern states, and states of the intermountain west, including Wyoming, Utah, Colorado, New Mexico, and Arizona.

An abundant, readily available food supply in conjunction with one or more suitable night roost sites is the primary characteristic of occupied bald eagle winter habitat. The majority of wintering bald eagles are found near open water where they feed on fish and waterfowl, often taking those that are dead or vulnerable. When suitable habitat conditions exist, particularly lack

of human disturbance, wintering bald eagles will also forage in terrestrial habitats capturing small and medium sized mammals (e.g., prairie dogs and rabbits) or scavenging carrion or roadkill, and winter mortalities of big game or livestock (USFWS 1983).

Inclement weather is also a major impetus for communal roosting. Roosts are usually located on the leeward sides of mountains, woodlots, or in protected canyons. Communal night roosts are used more often during days of winds greater than 17 km/hr (Steenhof *et al.* 1980) or during periods of inclement weather (Anderson and Patterson 1988). Platt (1976) observed that the most protected stand on the wintering site was consistently used as a roost during severe weather. Large, live trees in sheltered areas provide a more favorable thermal environment and help minimize the energy stress encountered by wintering eagles. Communal roosting also may facilitate pair bonding. Freedom from human disturbance also is important in communal roost site selection (Steenhof *et al.* 1980, USBR 1981, USFWS 1986, Buehler *et al.* 1991). Continued human disturbance of a night roost may cause eagles to abandon an area (USFWS 1983).

Anderson and Patterson (1988) characterized bald eagle winter roosts in Wyoming. Twenty-three roosts were located, which contained from one to 24 eagles. Roosts were located on slopes with northeasterly aspects and typically in forest stands with high densities of conifers and snags. These forest stands had larger and more open trees than the surrounding forest.

The number of eagles using a roost and times of arrival to and departure from the roost are influenced by temperature, precipitation, and wind conditions. During moderate weather, eagles usually leave the roost at dawn, and may ride thermal currents in the vicinity of the roost for up to a half hour before departing for feeding areas (USBR 1981). Eagles have been observed to fly over 15 miles from their feeding areas to roosting sites (Swisher 1964).

Hunting Behavior. The bald eagle typically hunts from perches or while soaring over suitable prey habitat. Prey is often taken off the wing including snatching fish from surface waters, snaring waterfowl in the air, or pouncing on small mammals. When it is available, carrion is also eaten. General foraging habitats include nearly all upland and aquatic habitats that support sufficient prey species. In Wyoming, suitable general foraging habitats can include grasslands, shrublands, streams, rivers, lakes, and reservoirs. Concentrated foraging habitats are typically habitats that support high densities of prey species and can often be a reliable source of prey for wintering bald eagles. In Wyoming, concentrated foraging habitats can include big game crucial winter ranges, ice-free water bodies that support fish and waterfowl during the winter, cattle and sheep stockyard operations, and big game roadkill.

Diurnal Perches. Diurnal perch sites are important components of bald eagle habitat. Perch sites serve a number of functions such as vantage points for hunting, observation posts to increase vigilance against predators, locations for loafing and sunning, and in some cases diurnal perches double as night roosts. Selection of a day perch by bald eagles is determined primarily by the location of the food resource and secondarily by the visibility provided by the perch site. When available in appropriate locations and of sufficient size, trees are preferred perches (Stalmaster and Newman 1979, Steenhof *et al.* 1980). Trees must be strong enough to support an eagle's weight, offer unobstructed views of potential food sources and the surrounding area, and provide for easy landing and takeoff. Preferred species possess the physical characteristics (size and growth form) and location (near open areas, proximity to a food source) required by eagles. Cottonwoods (*Populus* spp.) for example, are preferred along the Platte River in Nebraska (Vian and Bleise 1974) because of their large size and proximity to water.

Approximately 90 to 95 percent of the eagles along the Nooksack River in Washington were perched within close proximity of the river (Stalmaster *et al.* 1979). Bald eagles tend to select trees which are bordered by an open area (Steenhof *et al.* 1980). Riverbanks, rangeland, cropland, creeks, and roads are all important edge components.

The single most important feature of potential perch sites is that they be located close to and in view of a potential food source (Vian and Bleise 1974, Stalmaster and Newman 1979, Steenhof *et al.* 1980). Perching comprises much of the eagles' day. In one study, perched eagles accounted for nearly 75 percent of all observations and over 80 percent of sightings recorded along the Platte River between 1977 and 1981 (USBR 1981). Perch site preferences were related to the availability of trees, proximity to foods, water conditions of rivers and lakes, and overall visibility. The importance of perch sites close to water was apparent as nearly 98 percent of the eagles perched near reservoirs and 89 percent of those near rivers were within 60 meters of the shoreline. Deciduous trees, the most frequently observed perch sites, were typically cottonwoods located adjacent to water.

Freedom from human disturbance is important in diurnal perch site selection and may influence the distribution of perched eagles in an area. Stalmaster and Newman (1978) found that eagles usually avoided areas of "high human activity." Once disturbed on the feeding grounds eagles may not readily return to that area to feed. During particularly severe weather, continued disturbances may sufficiently stress eagles to cause them to leave the area.

Diurnal perches located close to the nest are important for hunting, loafing, and monitoring the nest. Favored perches are used consistently year-after-year, are generally 100 to 200 meters from the nest tree, and provide an unobstructed view of the nest (Herrick 1924).

Foods. The availability of food is probably the single most important factor affecting bald eagle distribution and local population sizes. Bald eagles congregate at locally abundant easily exploitable food sources, and population densities fluctuate with food availability. Fish are an important food of the bald eagle throughout much of its winter range. Fish are the primary staple of the winter diet along watercourses and on lakes, although other food sources are exploited elsewhere (Wright 1953, Southern 1964, Ingram 1965, Fitzner and Hanson 1979). Vian and Bleise (1974) concluded that fish made up the bulk of the diet of eagles along the Platte and North Platte Rivers in Nebraska although waterfowl were abundant. United States Bureau of Reclamation (USBR) biologists documented that fish was an important winter staple of eagles along the Platte River (USBR 1981).

Waterfowl are also important in the diet of bald eagles. Waterfowl can comprise most of the diet of eagles in areas where fish are not plentiful or readily caught because of ice conditions (USBR 1981). Wintering eagles in Missouri fed primarily on dead and crippled geese (*Branta canadensis*). In Nebraska, pellet analyses and observations indicated that waterfowl were a major food source, particularly on reservoirs.

Bureau of Reclamation's bald eagle studies conducted between 1978 and 1981 (USBR 1981) found that most wintering eagles using North Platte and Platte Rivers aquatic areas were associated with open water and waterfowl concentrations. Over 50 percent of the feeding observations reported during three winters of observations involved waterfowl. Eagles observed on the ice were within 100 ft of waterfowl in 55 percent of 1109 observations. Bald eagles were observed flying over, chasing, and eating ducks, geese, and coots (*Fulica americana*). Most of

the feeding observations were of ducks, and all of the roosts contained some pellets composed of waterfowl remains. In many instances where suitable perch trees were present nearby, eagles rested on the ice in close proximity to waterfowl. Ducks and geese maintained ice-free areas in reservoirs and eagles sometimes perched on uplifting and irregularities on the ice near waterfowl.

Fish and waterfowl carrion are another important component of the eagles' diet (USBR 1981). Immature eagles relied heavily on these food items at several reservoirs during the survey period. Nearly all eagles associated with carrion and 75 percent of those associated with waterfowl were immature. On some Bureau of Reclamation reservoirs, immatures outnumbered adults, particularly during the early winter when waterfowl numbers were highest. As less adept hunters, subadults are more dependent on concentrated food resources and carrion throughout their wintering range and often congregate around abundant food sources (Sherrod *et al.* 1976, Schwilling 1980).

The extent of the southern migration in winter probably depends on the severity of the weather. As water sources freeze, and fish, waterfowl and carrion are no longer available to eagles, they tend to move further south in order to find more easily exploitable food sources.

In Nevada, Utah, Wyoming, and portions of western Colorado, however, some bald eagle winter concentrations were not related to the existence of water but were associated with carrion provided by big game and domestic sheep (*Ovis* spp.) (Swisher 1964, Platt 1976, Anderson and Patterson 1988). Carrion provides an important dietary supplement in some areas and is the primary food source in others. Deer (*Odocoileu*s spp.) carcasses are commonly eaten (Ingram 1965, Stalmaster *et al.* 1979) as are those of cattle (*Bos taurus*) and sheep (Hancock 1964, Anderson and Patterson 1988). Food habits of wintering eagles within the Greater Yellowstone Ecosystem (GYE) reflect the seasonal availability and abundance of food on ungulate winter ranges throughout the GYE due to winter mortality, predation and hunting.

Studies conducted at Jackson Canyon, Wyoming between 1975 and 1977 included an analysis of prey remains and cast pellets (Lund 1978). Antelope, coyote, and waterfowl, in that order, were the most common components of pellets with some sheep, beaver (*Castor canadensis*), and raccoon (*Procyon lotor*) also identified. Although antelope and waterfowl were frequently identified from Wyoming roost castings collected in 1979 and 1980 (USBR 1981), over 50 percent of most pellet remains were comprised of rabbit hair and sheep wool. It should be noted, however, that studies of raptor diets based on pellet contents are highly biased and these biases are exaggerated in raptors which digest most bone material small enough to swallow. Cast pellet analysis under-estimate the importance of fish in the eagle diet as the bones and scales may be completely digested and pellets may not be formed (Brown 1974). For a fish-eating species such as the bald eagle, this causes serious errors in determining its true food habits in any quantitative way (Jenkins 1980).

Wintering bald eagles in Wyoming generally occur in areas associated with large, ice-free water bodies and near winter concentrations of ungulates, livestock, waterfowl, and/or fish. The distribution of bald eagle nesting and winter roosting areas is associated with habitat availability and amount of human disturbance. Most open habitats with sufficient prey base in Wyoming can be utilized for foraging by bald eagles. Foraging bald eagles are less sensitive to human disturbance and will tolerate more human activities in foraging habitats than they will near nesting and winter roosting areas. As a result, human activities are less restrictive to the distribution of foraging bald eagles than to nesting or roosting eagles.

Nesting eagles are also similarly dependent on reliable sources of food, especially fish and waterfowl. Primary feeding areas are large bodies of open water, and rarely smaller streams or ponds (Leighton *et al.* 1979). In the Greater Yellowstone Ecosystem, a stable food source, which was available beginning in early spring, appeared to be the most important factor in breeding area selection by eagles (Swenson *et al.* 1986). Swenson *et al.* (1986) found that the differences in movements, breeding success, nest site selection, and nesting chronology among bald eagles in the Greater Yellowstone Ecosystem were primarily due to differences in the amount and timing of food availability. During the breeding season mammalian food becomes less important as fish and aquatic birds become available.

Elsewhere, nesting eagles appear to rely on a greater variety of foods. Bald eagles in Maine preyed upon or took as carrion at least 34 species of invertebrates (Todd *et al.* 1982). Use of rabbits, songbirds, invertebrates, small animals and carrion has also been reported for nesting eagles by Smith (1963), Retfalvi (1970), Sherrod *et al.* (1976), and Jenkins (1981).

Although a variety of food can be taken, fish composed 77 percent of the food item remains collected at bald eagle nests in interior Maine (Todd *et al.* 1982). Bald eagles nesting on offshore coastal islands fed primarily on seabirds and waterfowl. In north-central Minnesota, the diet of breeding eagles was 90 percent fish (Dunstan and Harper 1975). Studies in Ohio showed that nesting bald eagles fed primarily on fish (Herrick 1924). At San Juan Island, Washington, fish composed 51 percent of the breeding season diet (Retfalvi 1970).

Bald eagle prey selection is determined largely by availability. In Maine, eagles focused on the chain pickerel (*Esox niger*) spawning run in April, then on the sucker (*Catostomus* spp.) spawning run in May (Todd *et al.* 1982). Birds accounted for 68 and 47 percent of the diet of bald eagles in some areas of the Greater Yellowstone Ecosystem (GYE) while fish made up 67 percent of the diet in other areas of the GYE in response to habitat differences and prey availability (Swenson *et al.* 1986). In one area of the GYE, aquatic birds comprised the majority of food taken by bald eagles later in the breeding season. However, early in the breeding season these same eagles heavily utilize cutthroat trout (*Salmo clarki*), corresponding with peak spawning activity in shallow streams. When waterfowl became more available during the postnuptial molt period, they were readily taken by eagles at that time.

Jenkins (1980) studied the home range movements and feeding activities of a pair of nesting eagles near Basin, Wyoming. Data regarding food habits were gathered through direct observation at the nest, periodic collection of pellets and food remains from and under the nest and favorite perch sites. Food items noted included carp and other fish, sheep, pheasant, and three species of waterfowl. During the early nesting season, the adult male was sometimes absent for hours before returning with food. With the increase in flows in the Big Horn River in June, the male was observed to be absent for a few minutes before returning to the nest with food, usually a fish of unknown species. High water coincided with or was related to the apparent increase in fish availability.

Bald Eagle Population Dynamics

It is estimated that the bald eagle population numbered 250,000 to 500,000 bald eagles living on the North American continent before the first Europeans arrived. Loss of prey species, hunting, pesticide use, and loss of habitat are the major causes of population declines.
A bald eagle recovery plan was established in the mid-1970's, resulting in the Service dividing

the lower 48 states into 5 recovery regions. Recovery plans for each region were developed with goals and tasks for recovery. Since 1974, the number of occupied breeding areas in the lower 48 states has increased by 462 percent, and since 1990, there has been an additional 47 percent increase in bald eagle numbers (USFWS 1995b). In 1995, the bald eagle was reclassified as threatened, and recently the bald eagle has been proposed for delisting (USFWS 1999c).

In Wyoming, the bald eagle falls within the Pacific Bald Eagle Recovery Plan (USFWS 1986). The primary objective for this area is to provide secure habitat for bald eagles within the 7-state Pacific recovery area and to increase population levels in specific geographic areas to the extent that the species can be delisted. Management goals are to have: (1) a minimum of 800 nesting pairs in the Pacific Recovery Area, (2) an average reproductive rate of 1.0 fledged young per pair, with an average success rate per occupied site of not less than 65 percent, (3) the attainment of breeding population goals in at least 80 percent of the management zones with nesting potential, and (4) stable or increasing wintering populations. Jenkins (1980) summarized sightings of bald eagles in Wyoming obtained from annual Audubon Christmas Bird counts from 1963-1979. Observers recorded between five and 176 eagles, on surveys totaling 195 to 2,805 miles in length. Bald eagles are routinely counted during mid-winter waterfowl/eagle surveys conducted by the Wyoming Game and Fish Department. Between 1974 and 1979, biologists recorded an average of 55 bald eagles (range of 22 to 132) in the Central Flyway (that portion of Wyoming east of the Continental Divide) (Jenkins 1980). Low-level fixed-wing aircraft censuses of wintering golden eagles in east-central Wyoming (between Casper, Lusk, Mule Creek Junction and Midwest) conducted annually from 1965 until 1979 by the Service revealed between 13 and 49 bald eagles annually (average of 24) (Jenkins 1980).

Currently, the largest nesting concentration of bald eagles in Wyoming is in the northwest corner of the state, in the Greater Yellowstone area. Bald eagle nesting has also been documented along several major drainages throughout the state. Results of annual surveys indicate bald eagle populations within the state are increasing and have exceeded management goals since 1987. In 1999, 97 bald eagle pairs produced 85 young in Wyoming (WGFD 2000).

According to surveys conducted by Wyoming Game and Fish (WGFD 2004), of 60 territories in Western Wyoming 50 were occupied and 46 were active as of June 2004. As of July 2005 (WGFDb), an additional 4 territories had been tentatively identified although status of most of these sites is currently unknown. As of January 2004 (WGFD 2005a) in the Platte River Basin in Wyoming, there were 73 known bald eagle territories, although 4 additional sites were identified as possible or probably.

Bald Eagle Status and Distribution

Laws protecting the bald eagle were implemented as early as 1918 with the Migratory Bird Treaty Act, the domestic law that affirms the United States' commitment to four international conventions with Canada, Japan, Mexico and Russia for the protection of shared migratory bird resources. In 1940, the Bald Eagle and Golden Eagle Protection Act was passed, prohibiting the take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, export or import, of any bald eagle, alive or dead, including any part, nest, or egg, unless allowed by permit. Take includes pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. The Endangered Species Act of 1973, as amended (Act), 16 U.S.C. 1531 *et seq.* is the most recent federal law which offers protection to the bald eagle. On February 14, 1978, the bald eagle was listed under the Act as an endangered species throughout the lower 48 States

except in Michigan, Minnesota, Wisconsin, Washington, and Oregon, where it was designated as threatened. On July 12, 1995, the Service reclassified the bald eagle from endangered to threatened throughout its range in the lower 48 states (USFWS 1999c). Most recently (July 6, 1999), the bald eagle was proposed for delisting (USFWS 1999c). The proposal has not been finalized or withdrawn to date.

The bald eagle historically ranged throughout North America except for extreme northern Alaska and Canada and central and southern Mexico. They nest from Florida to Baja California, and Labrador to the western Aleutian Islands of Alaska.

In Wyoming, bald eagles are often not dependant on habitat attributes provided by public lands, but rather are opportunistic inhabitants that will move from area to area where conditions and food sources are most favorable. Bald eagles can be found throughout the winter in both prairie and forested areas. Typically winter migrant bald eagles in Wyoming arrive in late winter, depending on the severity of weather conditions in their northern range.

Preble's Meadow Jumping Mouse Status

Preble's meadow jumping mouse (*Zapus hudsonius preblei*) (Preble's) was listed as a threatened species on May 13, 1998 (63 F.R. 26517; USFWS 1998). This species currently has critical habitat designated under the Act. Preble's is a small rodent in the family Zapodidae and is 1 of 12 recognized subspecies of the species the meadow jumping mouse (*Zapus hudsonius*). Preble's is native only to the Rocky Mountains-Great Plains interface of eastern Colorado and southeastern Wyoming. The holotype for Preble's was first collected by E. A. Preble in 1895 and taxonomically labeled as *Z. h. campestris* in 1899. Upon review by Krutzch (1954), the Colorado and southeastern Wyoming meadow jumping mice were separated into their own distinct subspecies, *preblei*.

Preble's Species Description

Preble's is 8 to 9 inches long (its tail accounts for 60 percent of its length) with hind feet adapted for jumping. *Z. hudsonius* was described by Quimby (1951) in the following manner: "A mouse-like rodent with greatly enlarged hind feet and an exceptionally long tail. The forelegs are relatively short. The ears are somewhat conspicuous. The body is clothed in moderately long, somewhat dense hair of a rather coarse texture and several colors. The dorsal portions are marked by a broad stripe of brownish hairs many of which are tipped with black giving the region a grayish-black appearance. The sides are bright yellowish-orange, whereas the underparts and feet are white. The tail is bicolor, dark above and light below and sparsely covered with hair which is longer on the terminal part. Preble's have eight mammae which are quite prominent in lactating females. The male genitalia are inconspicuous except during the breeding season when the scrotal sac becomes enlarged. The testes enlarge and may be abdominal, inguinal, or scrotal during this period."

The coloration of Preble's was described in more detail by Krutzsch (1954) as "color dull, back from near Clay Color to near Tawny-Olive with a mixture of black hair forming poorly defined dorsal band; sides lighter than back from near Clay Color to near Cinnamon-Buff; lateral line distinct and clear Ochraceous-Buff; belly white, sometimes faint wash of clear Ochraceous-Buff; tail bi-colored, brownish to light brownish-black above, grayish-white to yellowish-white below" (capitalized color terms refer to a scientific standard, while lower case terms reflect common

usage). Krutzch (1954) differentiated Preble's from *Z. h. campestris* by the following taxonomic features: "a less distinct dorsal band with fewer black tipped hairs; smaller cranial measurements; a narrower interorbital constriction; smaller, less inflated auditory bullae; narrower incisive foramina; and a more inflated frontal region than *Z. h. campestris*." Fitzgerald *et al.* (1994) describes *Z. hudsonius* as having a narrower braincase, smaller molars, a less pronounced mid-dorsal band, and smaller average total length than *Z. princeps*. Meadow jumping mice (*Z. hudsonius*) sampled in Colorado and Wyoming range in total length from 187 to 255 millimeter (mm); tail length from 108 to 155 mm; and hindfoot length from 20 to 35 mm (Fitzgerald *et al.* 1994). Quimby (1951) noted variability in body weights for different individuals and for the same individual during different levels of activity and seasons. Body weights for 65 individuals sampled in Wyoming ranged from 14 to 40 grams.

Preble's Life History/Habitat Use

Little is known about the life history of Preble's. Preble's is thought to be similar to other *Z. hudsonius* in patterns of diet, behavior, breeding and habitat utilization. In general, *Z. hudsonius* subsists on seeds, small fruits, fungi and insects (Whitaker Jr. 1972, Fitzgerald *et al.* 1994). Grass seeds are the most important part of Preble's diet, but more invertebrates are eaten in the spring as mice emerge from hibernation (Young, Jr. 2001). It has been speculated that Preble's may need an open water source to fulfill dietary requirements. Shenk and Sivert (1999b) noted the use of both perennial and intermittent tributaries adjacent to capture sites. Preble's is adapted for digging; creates nests of grasses, leaves, and woody material several centimeters below the ground; and is primarily nocturnal or crepuscular, but can be observed during daylight.

Z. hudsonius hibernates approximately 7 months of the year in an underground burrow that it excavates itself (Quimby 1951, Whitaker Jr. 1963). *Z. hudsonius* hibernate in dry upland sites adjacent to the riparian habitats they occupy during the summer (Clark and Stromberg 1987, Whitaker, Jr. 1972). Data on the timing of the initial breeding period and time of hibernation of Preble's have been gathered by researchers at Rocky Flats in Colorado (PTI Environmental Services 1996). The month of May marks the beginning of the active period for Preble's; with May 5 the earliest capture date at Rocky Flats. Breeding probably occurs soon after emergence. During the breeding season (June to mid-August), females typically have 2 to 3 litters of 5 to 6 young per litter (Quimby 1951, Fitzgerald *et al.* 1994). Adults begin hibernation in early September, while juveniles enter hibernation from mid-September to late October. The latest recorded date of capture of Preble's at Rocky Flats is October 27. Adults reach approximately 20 percent body fat before going into hibernation (USFWS 1998). Preble's has been shown to move a significant distance along drainages. For example, a male Preble's was recaptured 1.6 kilometers (km) (1 mile) upstream from a previous capture site and a female Preble's was captured 1.2 km (.75 mile) downstream from a previous capture site (USFWS 1998). Shenk and Sivert (1999a) found maximum movements of Preble's to be more than a mile.

Preble's constructs day nests composed of grasses, forbs, sedges, rushes, and other available plant material. Nests may be globular in shape or simply raised mats of litter, and are most commonly found above ground but can also be located below ground. Nests 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 one week of use (Ryon 2001).

Preble's Population Dynamics

Actual population size and abundance for this species is not known. Preble's may never have been widespread in the period since western settlement. Armstrong (1972) described Preble's as poorly known in Colorado and apparently nowhere abundant. Preble's distribution is confined to eastern Colorado and southeastern Wyoming (Krutzsch 1954, Armstrong 1972). Once common in the tallgrass prairie of eastern Colorado, this relict of the Ice Age is now limited in its ecological and geographic distribution to scattered locations on the Colorado Piedmont (Fitzgerald *et al.* 1994). The known historical range of Preble's may represent a relict of a more southern range of *Z. hudsonius*, occupied when the climate was cooler and more damp (Fitzgerald *et al.* 1994). Fitzgerald *et al.* (1994) estimated Preble's home range to be approximately 0.2-0.9 acre (0.08 - 0.35 hectare) and densities to be between 3 and 6 mice per acre (7-15 per hectare). However, according to the Final Rule summary presented by the USFWS (1998), Preble's home ranges may vary from approximately 0.81 to 1.23 acres. This current information suggests that the loss of approximately one acre would constitute the loss of approximately one Preble's home range, on average, but depending on the number of overlapping home ranges it is possible that more than one Preble's home range could be affected per acre. Patterns of capture suggest that populations may fluctuate over time at occupied sites (Shenk 1998, unpublished report).

Preble's Distribution

Records for Preble's define a range including Adams, Arapahoe, Boulder, Denver, Douglas, El Paso, Elbert, Jefferson, Larimer, and Weld Counties in Colorado; and Albany, Laramie, Platte, and Converse Counties in Wyoming (Krutzsch 1954, Compton and Hugie 1993). In Wyoming, capture locations of mice confirmed as Preble's, and locations of mice identified in the field as Preble's and released, extend in a band from the town of Douglas southward along the Laramie Range to the Colorado border, with captures east to eastern Platte County and Cheyenne, Laramie County. In Colorado, the distribution of Preble's forms a band along the Front Range from Wyoming southward to Colorado Springs, El Paso County with eastern marginal captures in western Weld County, western Elbert County and north-central El Paso County.

In Wyoming, Preble's has been trapped from approximately 40 sites in Albany, Laramie, Platte and Converse counties. Due to extremely limited sampling in Goshen County, the full extent of Preble's historic and present distribution is currently not known. The Service indicates potential habitat for Preble's exists in Wyoming along the 100-year floodplains of the North Platte River, Lodgepole Creek and their tributaries, as well as the tributaries of the South Platte River east of the Laramie Mountains and south of the North Platte River in Albany, Converse, Goshen, Laramie, and Platte Counties (USFWS 1999b). Recent surveys have documented numerous sites with *Zapus* spp. throughout the suspected range of Preble's in Wyoming.

While historical status in Wyoming is unclear (Garber 1995), Preble's is not currently known from its suspected former range in Goshen and Natrona counties. Garber documented Preble's persisting at only two Wyoming sites, commented on the difficulty of capturing Preble's at these sites, and concluded that substantial additional work was needed to fully determine the status of Preble's in Wyoming.

Typical Preble's habitat is comprised of well-developed plains riparian vegetation with adjacent, undisturbed grassland communities and a nearby water source. Well-developed plains riparian

vegetation typically includes a dense combination of grasses, forbs, and shrubs; a taller shrub and tree canopy may also be present (Bakeman 1997). When present, the shrub canopy is often willow (*Salix* spp.), although other shrub species, including snowberry (*Symphoricarpus* spp.), chokecherry (*Prunus virginiana*), hawthorn (*Crataegus* spp.), Gambel's oak (*Quercus gambelli*), alder (*Alnus incana*), river birch (*Betula fontinalis*), skunkbrush (*Rhus trilobata*), wild plum (*Prunus americana*), lead plant (*Amorpha fruticosa*), dogwood (*Cornus sericea*), and others may also occur (Bakeman 1997, Shenk and Eussen 1998).

Krutzsch (1954), Quimby (1951), and Armstrong (1972) agree that across its range, *Z. hudsonius* occurs mostly in low undergrowth consisting of grasses, forbs (herbaceous plants other than grasses), or both, in open wet meadows and riparian corridors, or where tall shrubs and low trees provide adequate cover. In addition, *Z. hudsonius* prefers lowlands with medium to high moisture over drier uplands. Whitaker Jr. (1972) concluded that *Z. hudsonius* avoids the sparse vegetation that is generally associated with low moisture habitats. Fitzgerald *et al.* (1994) described *Z. hudsonius* as most common in wooded areas. Tester *et al.* (1993) suggested that proximity to water may be the most important factor influencing habitat selection and utilization by *Z. hudsonius*.

Meaney *et al.* (1997) suggested that Preble's has a broader ecological tolerance than previously thought and while they require diverse vegetation and well developed cover, this can be met in a variety of circumstances. Recent captures that were exceptions to the typical habitat described include individuals found along irrigation ditches and in mesic grassy fields. Ensight Technical Services (1997) reported instances of Preble's trapped at or near sites of human alteration including ditches along roads and driveways, and wetlands adjacent to highways. Meaney *et al.* (1997) emphasized that vegetated ditches may be a significant habitat for Preble's and may also provide adequate dispersal routes.

Garber (1995) characterized capture sites along Lodgepole Creek, Albany County, Wyoming as moist areas near beaver ponds with dense sedges and *Salix* spp. Ryon (1996) suggested that where Preble's occupies habitat along intermittent streams, adjacent wet meadows and seeps may be important habitats in dry periods. Armstrong *et al.* (1997) described typical Preble's habitat as "well-developed plains riparian vegetation with relatively undisturbed grassland and a water source in close proximity." Also noted was a preference for "dense herbaceous vegetation consisting of a variety of grasses, forbs and thick shrubs."

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 foraging and resting in adjacent uplands (Shenk and Sivert 1999b, Ryon 1999, Schorr 2001). These studies reveal that Preble's regularly utilizes uplands at least as far out as 100 meters (328 feet) beyond the 100-year floodplain (Ryon 1999). Fifteen likely Preble's hibernacula (hibernation nests) have been located. Of these, one was confirmed through excavation. Nests were found between 1 and 78 meters (3 and 260 feet) from a perennial stream bed or intermittent tributary (Bakeman and Deans 1997, Shenk and Sivert 1999a, Schorr 2001). Likely 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). At the U.S. Air Force Academy in El Paso County, Colorado, 4 of 6 likely hibernacula found by radio telemetry were located in close proximity to coyote willow (*Salix exigua*) (Schorr 2001). One confirmed hibernaculum at the Department of Energy's Rocky Flats Environmental Technology Site in

Jefferson County, Colorado, was found 9 meters (30 feet) above the stream bed, in a dense patch of chokecherry and snowberry (Bakeman and Deans 1997). This nest was constructed of leaf litter 30 centimeters (12 inches) below the surface in coarse textured soil.

Threats to Preble's

Habitat loss and fragmentation resulting from human land uses have adversely impacted Preble's populations, and continue to do so. Preble's populations in Colorado and Wyoming are threatened by ongoing and increasing urban, industrial, agricultural, ranching, and recreational development; ongoing and increasing wetland/riparian habitat destruction and/or modification; small size of known populations; and inadequacy or lack of government protection for the species and its habitats (USFWS 1998). Compton and Hugie (1993) cited human activities that have adversely impacted Preble's including conversion of grasslands to farms; livestock grazing; water development and management practices; and, residential and commercial development. Shenk (1998) linked potential threats to ecological requirements of Preble's and suggested that factors which impacted vegetation composition and structure, riparian hydrology, habitat structure, distribution, geomorphology, and animal community composition must be addressed in any conservation strategy.

Residential and commercial development, accompanied by highway and bridge construction, and instream alterations to implement flood control, directly remove Preble's habitat, or reduce, alter, fragment, and isolate habitat to the point where Preble's can no longer persist. Corn *et al.* (1995) proposed that a 100 meter (328 feet) buffer of unaltered habitat be established to protect the floodplain of Monument Creek (Colorado) from a range of human activities that might adversely affect Preble's or its habitat. Shenk and Sivert (1999b) believed that a 300-foot buffer did not adequately protect much of the population. Roads, trails, or other linear developments through Preble's habitat may act as barriers to movement. Shenk (1998) suggested that on a landscape scale, maintenance of acceptable dispersal corridors linking patches of Preble's habitat may be critical to its conservation.

Predation on Preble's has always existed as a naturally occurring association between predator and prey. While evidence is scant, human development may have altered this relationship. Development may affect Preble's populations through the introduction of the house mouse and the domestic cat. Both of these species may significantly affect populations of Preble's by predation and competition (Shenk 1998). Armstrong *et al.* (1996) recommended studies be conducted on influences of the suburban environment and associated densities of species such as the striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), great horned owl (*Bubo virginianus*), and the domestic cat (*Felis catus*) on Preble's. Free-ranging domestic cats may present a problem to Preble's. Corn *et al.* (1995) recommended a 1.5 km (0.9 mi) setback of housing development from Preble's habitat to exclude predation by "house cats."

Preble's, as well as other native rodents, carry parasites and diseases that may reduce vigor, curtail reproductive success, and cause death. There is no evidence whether or not any epizootic disease has caused significant impacts to Preble's. While plague is regularly found in other rodent species within Preble's range, its impact to Preble's populations is not known. In addition, the tolerance of Preble's for exotic plant species is not well understood. Whether or not exotic plant species reduce Preble's persistence at a site may be due in large part to whether plants create a monoculture and replace native species. There is particular concern about the establishment of non-native species such as leafy spurge (*Euphorbia esula*) and Canada thistle

(*Cirsium arvense*). Such species can form monoculture stands of vegetation, thus displacing native vegetation and reducing available Preble's habitat.

Armstrong *et al.* (1997) concluded that Preble's in this region, as elsewhere, is a habitat specialist, and that its specialized habitat is declining. Trapping surveys have provided evidence that Preble's has declined throughout portions of its range. This decline and future threats to existing Preble's populations are linked to widespread habitat alteration. The Colorado Piedmont east of the Front Range and adjacent areas of southeastern Wyoming have changed from predominantly prairie habitat intermixed with perennial and intermittent streams and associated riparian habitats, to a more agricultural and urban setting with grazing, residential, commercial, industrial, and recreational development. The Colorado Front Range urban corridor represents only about 4 percent of the State's land area but supports 80 percent of Preble's population.

The apparent local extirpation of Preble's from historically occupied sites in Colorado and Wyoming, and the difficulty in finding Preble's in patches of apparently adequate but fragmented habitat isolated by human land uses, suggests a decline in populations of Preble's in recent decades. Recent trapping efforts have located Preble's populations in some areas (Douglas, El Paso, and Elbert counties, Colorado) where few or no historical records exist. However, recent trapping has also failed to produce captures at historical sites and sites with apparently suitable habitat within Preble's historic range. The Service believes that Preble's has undergone a decline in range and that populations within its remaining range have been lost.

Critical Habitat

Critical habitat is defined in section 3(5)(A) of the Act as (i) 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 (I) essential to conserve the species and (II) that may require special management considerations or protection; and (ii) 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. "Conservation" means the use of all methods and procedures that are necessary to bring an endangered or threatened species to the point at which listing under the Act is no longer necessary. In accordance with sections 3(5)(C) of the Act, not all areas that can be occupied by a species will be designated critical habitat. Within the geographic area occupied by the species we designate only areas currently known to be essential.

This biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 302.02. Instead, we have relied upon the statute and the August 6, 2004, Ninth Circuit Court of Appeals decision in *Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service* (No. 03-35279) to complete the following analysis with respect to critical habitat.

In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12, in determining which areas to designate as critical habitat the Service based critical habitat determinations on the best scientific and commercial data available and to consider physical and biological features (primary constituent elements) that are essential to conservation of the species, and that may require special management considerations and protection. These physical and biological features include, but are not limited to: (1) space for individual and population

growth, and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, rearing, (or development) of offspring; and (5) habitats protected from disturbance or that are representative of the historic geographical and ecological distributions of a species.

Critical habitat receives protection under section 7 of the Act through prohibition against destruction or adverse modification of critical habitat with regard to actions carried out, funded, or authorized by a Federal agency. In regulation 50 CFR 402.02, destruction or adverse modification of critical habitat is defined as "a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical." Aside from the added protection that may be provided under section 7, the Act does not provide other forms of added protection to lands designated as critical habitat. Because consultation under section 7 of the Act does not apply to activities on private land or non-Federal lands that do not involve a Federal nexus, critical habitat designation does not result in any regulatory requirements for these actions.

Designation of Preble's Critical Habitat

On June 23, 2003, the Service designated Critical Habitat for the Preble's Meadow Jumping Mouse pursuant to the Act (68 FR 37275-37332; USFWS 2003b). The designation includes eight habitat units totaling approximately 31,222 acres found along approximately 359 miles of rivers and streams in the States of Wyoming and Colorado. The designation includes river and stream reaches and adjacent areas in the North Platte River and South Platte River drainages.

Designated critical habitat units for Preble's include only river and stream reaches, and adjacent floodplains and uplands, that are within the known geographic and elevational range of Preble's, have the primary constituent elements present, are based on the best scientific data available, and are believed to currently support Preble's. The Service has typically defined Preble's habitat as extending outward 100 meters from the outer edge of the 100 year floodplain of rivers and streams. For critical habitat designation, the Service delineated critical habitat as 110 meters (360 feet) outward from the stream edge of 1st and 2nd order streams. For 3rd and 4th order streams, the Service delineated critical habitat as 120 meters outward from the stream edge. For 5th order streams and above, the Service delineated critical habitat as 140 meters outward from the stream edge (USFWS 2003b).

Primary Constituent Elements of Preble's Critical Habitat

The primary constituent elements for Preble's include those habitat components essential for the biological needs of reproducing, rearing young, foraging, sheltering, hibernation, dispersal, and genetic exchange. Preble's is able to live and reproduce in and near riparian areas located within grassland, shrubland, forest, and mixed vegetation types where dense herbaceous or woody vegetation occurs near the ground level, where available open water normally exists during their active season, and where there are ample upland habitats of sufficient width and quality for foraging, hibernation, and refugia from catastrophic flooding events. While willows of shrub form are a dominant component in many riparian habitats occupied by Preble's, the structure of the vegetation appears more important to Preble's than species composition.

Primary constituents elements associated with the biological needs of dispersal and genetic exchange also are found in areas that provide connectivity or linkage between or within Preble's populations. These areas may not include the habitat components listed above and may have experienced substantial human alteration or disturbance.

The dynamic ecological processes that create and maintain Preble's habitat also are important primary constituent elements. Habitat components essential to Preble's are found in and near those areas where past and present geomorphological and hydrological processes have shaped streams, rivers, and floodplains, and have created conditions that support appropriate vegetative communities. Preble's habitat is maintained over time along rivers and streams by a natural flooding regime (or one sufficiently corresponding to a natural regime) that periodically scours riparian vegetation, reworks stream channels, floodplains, and benches, and redistributes sediments such that a pattern of appropriate vegetation is present along river and stream edges, and throughout their floodplains. Periodic disturbance of riparian areas sets back succession and promotes dense, low-growing shrubs and lush herbaceous vegetation favorable to Preble's. Where flows are controlled to preclude a natural pattern and other disturbance is limited, a less favorable mature successional stage of vegetation dominated by cottonwoods or other trees may develop. The long-term availability of habitat components favored by Preble's also depends on drought, fires, windstorms, herbivory, and other natural events. In some cases these naturally-occurring ecological processes are modified or are supplanted by human land uses that include manipulation of water flow and of vegetation.

Primary constituent elements for Preble's critical habitat include: (1) a pattern of dense riparian vegetation consisting of grasses, forbs, and shrubs in areas along rivers and streams that provide open water through Preble's active season, (2) adjacent floodplains and vegetated uplands with limited human disturbance (including hayed fields, grazed pasture, other agricultural lands that are not plowed or disked regularly, areas that have been restored after past aggregate extraction, areas supporting recreational trails, and urban/wildland interfaces), (3) areas that provide connectivity between and within populations (These may include river and stream reaches with minimal vegetative cover or that are armored for erosion control, travel ways beneath bridges, through culverts, along canals and ditches, and other areas that have experienced substantial human alteration or disturbance), and (4) dynamic geomorphological and hydrological processes typical of systems within the range of Preble's, i.e., those processes that create and maintain river and stream channels, floodplains, and promote patterns of vegetation favorable to Preble's (USFWS 2003b).

Existing features and structures within the boundaries of the critical habitat units, such as buildings, roads, parking lots, other paved areas, lawns, other urban and suburban landscaped areas, regularly plowed or disked agricultural areas, and other features not containing any of the primary constituent elements are not considered critical habitat.

Threats to Primary Constituent Elements of Preble's Critical Habitat

When designating critical habitat, the Service chose areas that had the greatest potential in aiding in the recovery of the species. Therefore, at the time of designation these areas had adequate primary constituent elements and had minimal threats to them. Identified threats to some critical habitat units include: (1) development including road construction and road improvements, and (2) grazing pressure (particularly during drought conditions), (3) substantial recreational use (rafting, kayaking, fishing) and (4) off-road vehicle use (USFWS 2003b).

Section 4(b)(8) of the Act, requires the Service to identify activities that may adversely modify critical habitat. Federal actions that, when carried out, funded or authorized by a Federal agency, may destroy or adversely modify critical habitat for Preble's include but are not limited to: (1) any activity that results in development or alteration of the landscape within a unit, including clearing; activities associated with construction for urban and industrial development, roads, bridges, pipelines, or bank stabilization; agricultural activities such as plowing, disking, haying, or intensive grazing; off-road vehicle activity; and mining or drilling of wells; (2) any activity that results in changes in the hydrology of the unit, including construction, operation, and maintenance of levees, dams, berms, and channels; activities associated with flow control (e.g., releases, diversions, and related operations); irrigation; sediment, sand, or gravel removal; and other activities resulting in the draining or inundation of unit; (3) any sale, exchange, or lease of Federal land that is likely to result in the habitat in a unit being destroyed or appreciably degraded; (4) any activity that detrimentally alters natural processes in a unit including the changes to inputs of water, sediments and nutrients, or that significantly and detrimentally alters water quantity in the unit; and (5) any activity that could lead to the introduction, expansion, or increased density of exotic plant or animal species that are detrimental to Preble's and its habitat (USFWS 2003b).

Colorado Butterfly Plant Description

The Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*) is a semelparous, perennial herb. It has one or a few reddish, hairy stems that are 2-3 feet tall. The lower leaves are lance-shaped with smooth or wavy-toothed margins and average 2-6 inches long, while those on the stem are smaller and 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 0.25-0.5 inches long with four reddish sepals (modified leaves surrounding the flower) and four white petals that turn pink or red with age. The hard, nutlike fruits are 4-angled and have no stalk. Non-flowering plants consist of a stemless, basal rosette of oblong, hairless leaves 1-7 inches long (Marriott 1987, Fertig 1994, Fertig *et al.* 1994).

Colorado Butterfly Plant Life History

The Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*) occurs on sub-irrigated, alluvial (stream deposited) soils on level or slightly sloping floodplains and drainage. Colonies are often found in low depressions or along bends in wide, active, meandering stream channels a short distance upslope of the actual channel. 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* (curlytop gumweed), and *Equisetum laevigatum* (smooth scouring rush) on drier sites. Both these habitat types are usually intermediate in moisture between wet, streamside communities dominated by sedges (*Carex* spp.), rushes (*Juncus* spp.), and cattails (*Typha* spp.), and dry, upland shortgrass prairie. Typical Colorado butterfly plant habitat is open, without dense or overgrown vegetation. *Salix exigua* (coyote willow) and *Cirsium arvense* (Canada thistle) may become dominant in Colorado butterfly plant habitats that are not periodically flooded or otherwise disturbed.

The Colorado butterfly plant is an early successional (although probably not a pioneer) plant adapted to use stream channel sites that are periodically disturbed. Historically, flooding was

probably the main cause of disturbances in the plant's habitat, although wildfire and grazing by native herbivores also may have been important. Although flowering and fruiting stems may undergo increased mortality because of these events, vegetative rosettes appear to be little affected (Mountain West Environmental Services 1985). The survival of vegetative rosettes appears to be related to available soil moisture. Heidel (2004, 2005a), for example, found a significant correlation between census number and summer precipitation two years prior in populations at the U.S. Department of Defense F. E. Warren Air Force Base (WAFB). Because the long-term viability of this plant relies on successful flowering and fruiting, as well as the difficulty in identifying small rosettes, only the flowering plants typically are counted to estimate population size and trends. The establishment and survival of seedlings appears to be enhanced at sites where tall and dense vegetation has been removed by some form of disturbance. In the absence of occasional disturbance, the plant's habitat can become choked out by dense growth of willows (*Salix* spp.), grasses (including red top (*Agrostis stolinifera*)), baltic rush (*Juncus balticus*), and exotic plants (such as Canada thistle (*Cirsium arvense*) and leafy spurge (*Euphorbia esula*)), which prevents new seedlings from becoming established and replacing plants that have died (Floyd 1995a).

Colorado Butterfly Plant Population Dynamics

The Colorado butterfly plant is distributed throughout its occupied range into patchy groups of subpopulations, some of which are isolated with little or no possibility of interbreeding with other local populations. The spatial structuring of this subspecies is commonly referred to as a metapopulation. Local populations exist on a patch of suitable habitat, and although each has its own, relatively independent population dynamics, the long-term persistence and stability of the metapopulation arise from a balance of population extinctions and colonization to unoccupied patches through dispersal events (USFWS 2004c).

Balancing local population extinction with new colonization events is problematic for the Colorado butterfly plant since naturally occurring disturbance associated with creation of suitable habitat for colonization, such as seasonal floods, has been largely curtailed by water development and flood control. Consequently, what once may have been a dynamic, but stable, metapopulation, may now be characterized by a series of local populations with a very low probability of colonizing new patches, and little opportunity to replace extirpated populations. Biological characteristics that may serve to reduce these negative consequences at least in the short-term for the Colorado butterfly plant include seed banks, delay of stage transition from rosette to flowering adults under poor habitat conditions, and self-compatibility. However, the regional persistence of a metapopulation has been shown to be possible only when the rate of colonization exceeds the local rate of extinction. Consequently, the removal of opportunities for future colonization events poses a significant threat to long-term metapopulation persistence and species viability. This highlights the importance of maintaining viability of as many local populations as possible through conservation (USFWS 2004c).

Most of what is known about the Colorado butterfly plant and its conservation is based on surveys and research conducted on populations located on the WAFB in Cheyenne, Wyoming, from 1984 to 2003. Floyd and Ranker (1998) studied three Colorado butterfly plant subpopulations at WAFB from 1992 to 1994. The purpose of their study was to examine population growth, demographic variability, demographic stage transition dynamics and the probability of population extinction. Results suggested that each of the three subpopulations was not stable but exhibited significant demographic variability both spatially and temporally, and

population growth values were not useful parameters to describe long-term population dynamics (Floyd and Ranker 1998, USFWS 2004c).

Annual census of flowering plants at WAFB began in 1986, and continued from 1988 to 2004, within subpopulations located at Crow Creek, Diamond Creek, and Unnamed Drainage. Census summaries provided by Heidel (2004) based on these data show that subpopulations within these three drainages are characterized by dramatic fluctuations in size (USFWS 2004c).

Most populations of the Colorado butterfly plant for which census or demographic data have been collected exhibit substantial demographic uncertainty. Some of the observed temporal variation in subpopulations at WAFB has been correlated with unpredictable environmental factors such as temperature and precipitation (Floyd and Ranker 1998, Heidel 2004), and spatial variation may be attributable, in part, to fine-scale microhabitat differences in light availability or competition with other herbaceous vegetation or noxious weeds (Munk *et al.* 2002, Heidel 2004). Similar factors may be correlated with some of the observed demographic variability in less-well-studied populations throughout the subspecies' range. However, even for the well-studied subpopulations at WAFB, no clear cause-and-effect relationships have been found to explain the observed fluctuations in population numbers, and studies have not accounted for the majority of the observed demographic uncertainty (USFWS 2004c).

Colorado Butterfly Plant Status and Distribution

On October 18, 2000, the Colorado butterfly plant was designated as threatened throughout its entire range under the Act (65 FR 62302; USFWS 2000), and on January 11, 2005, critical habitat was designated along 51 stream miles within Platte and Laramie Counties in Wyoming (70 FR 1940; USFWS 2005). It is a short-lived, perennial herb endemic to moist soils in mesic or wet meadows of floodplain areas in southeastern Wyoming, north-central Colorado, and extreme western Nebraska. This early to mid-seral stage species occurs primarily in habitats created and maintained by streams active within their floodplains with vegetation that is relatively open and not overly dense or overgrown.

Little is known about the historical distribution of the Colorado butterfly plant. Prior to 1984, no extensive documentation of the plants' range had been conducted. The plant was known from several historical (and presumably extirpated) locations in southeastern Wyoming and in northern Colorado, as well as from three extant populations in Laramie County in Wyoming and Weld County in Colorado. The total known population size was estimated in the low hundreds (Dorn 1979). Intensive range-wide surveys from 1984 to 1986 resulted in the discovery or relocation of more than 20 populations in Wyoming, Colorado, and Nebraska, containing approximately 20,000 flowering individuals (Marriott 1987). Additional surveys since 1992 have resulted in the discovery of additional populations in Wyoming and Colorado (Fertig 1994; Floyd 1995b). However, other historically known populations in Wyoming and Colorado have not been relocated in recent years and may no longer be extant (Fertig 1994).

Extensive surveys were conducted during 1998 to document the status of previously known populations at 14 sites in Wyoming and Colorado (Fertig 1998). All 14 sites supported populations of the Colorado butterfly plant. Repeated survey information led Fertig (1998) to conclude that 10 of these populations were either relatively stable or increasing over the long-term. Fertig (1998) estimated the entire population of this taxon to contain between 47,000 and 50,000 reproductive plants. Twelve previously known populations were not surveyed. Three of

these populations were surveyed from 1989 until 1992 and were found to contain a limited number of plants. However, four populations in Colorado and five in Wyoming have not been relocated since 1986 and may be extirpated.

Surveys were conducted by the Service in 2004 during which approximately 80 percent of all habitat occupied by the Colorado butterfly plant was surveyed. Of 77 known locations at least 0.2 miles apart previously identified by Wyoming Natural Diversity Database (WYNDD), 59 locations along 94 stream miles were surveyed. A total of 17,891 reproductively mature plants were counted throughout the survey area. While 23 of the previously known 59 locations contained no plants, 23 new locations 0.2 miles apart with adult plants were identified. All plants located during the survey were within Laramie County in Wyoming and Weld County in Colorado: neither plants, nor suitable habitat, were found in Nebraska likely because of habitat deterioration associated with 5 years of continuous drought.

These 2004 survey results on both private and State land, as well as updated surveys conducted by the Service in 2005, suggest that the Colorado butterfly plant occurs only in southeast Wyoming and northern Colorado, and is likely extirpated from Nebraska. Populations of the Colorado butterfly plant occur in two locations in Colorado, both currently owned by the City of Fort Collins: the Meadow Springs Ranch in northern Weld County where the plant has been known historically; and the Soapstone Prairie Natural Area in northern Larimer County where a new population was discovered in 2005.

Three additional populations, comprised of a total of 7,322 reproductively mature plants according to recent surveys, occur on F.E. Warren Air Force Base (Heidel 2005a). Survey results suggest that two of these populations appear relatively stable or increasing, while one appears to be declining (Heidel 2005a). Annual monitoring of these three populations by Wyoming Natural Diversity Database has continued for the past 18 years and is ongoing.

Colorado Butterfly Plant Threats

Of the known populations of Colorado butterfly plant, the vast majority occur on private lands managed primarily for agriculture and livestock. Haying and mowing at certain times of the year, water development, overgrazing, land conversion for cultivation, competition with exotic plants, non-selective use of herbicides, and loss of habitat to urban development are the main threats to these populations (Mountain West Environmental Services 1985, Marriott 1987, Fertig 1994). Because of the small, isolated nature of populations and few numbers present in many of them, the subspecies is much more susceptible to random events such as fires, insect or disease outbreaks, or other unpredictable events that could easily eliminate local populations. In nonagricultural, undeveloped areas, a significant threat to Colorado butterfly plant populations may result from natural succession of the plant community.

One major threat on agricultural lands may be the application of broadleaf herbicides for control of Canada thistle, leafy spurge, and other non-native plants (Marriot 1987). Although competition from weedy species may have negative impacts on Colorado butterfly plant populations, observations have indicated that the Colorado butterfly plant is highly susceptible to commonly used herbicides (especially if no special precautions are taken during application). Alternative (and presumably more Colorado butterfly plant-friendly) methods of weed control involving the release of bio-control insects, mowing, and new chemical application techniques, are currently being investigated (Fertig 1998).

While excessive grazing can lead to changes in essential habitat conditions (e.g., increases in soil temperature resulting in loss of moisture, decreases in plant cover, and increases in non-native species), managing for appropriate levels of grazing provides an important management tool with which to maintain open habitat needed by the Colorado butterfly plant. Grazing by cattle may be a threat at some sites, especially if animals are not periodically rotated or if use is concentrated in small areas during the summer flowering period. The habitat of the Colorado butterfly plant is often heavily used by livestock which tend to concentrate near water sources. In an instance of two adjacent pastures, Marriott (1987) observed that the more heavily grazed pasture supported far fewer individuals. Studies have shown that the Colorado butterfly plant may persist and thrive in habitats that are winter grazed or managed on a short-term rotation cycle (Fertig 1994, Mountain West Environmental Services 1985). Although reproductive individual Colorado butterfly plants may be grazed (the plant is quite palatable to a wide range of herbivores), the establishment and survival of seedlings and rosettes may be enhanced by the reduction of competing vegetative cover (Fertig 1994, 1996). Due to their low stature, rosettes do not appear to be regularly grazed (Mountain West Environmental Services 1985). Grazing by horses also occurs in many privately owned Colorado butterfly plant sites, but does not appear to negatively impact Colorado butterfly plant populations under normal stocking rates (Fertig 1998).

Fertig (1998) observed that mowing an area for hay production is rarely a threat to Colorado butterfly plant populations unless cutting is done before fruits are able to mature. Once fruits have ripened they are protected by a hard, woody fruit wall that is not readily damaged by machinery. Mowing in mid-summer may actually stimulate extra flower and fruit production through increased branching and the release of apical dominance in cut stems. Colorado butterfly plants may also benefit from decreased competition and enhanced moisture availability in mowed environments. Late summer and fall mowing may also facilitate seed dispersal, provided that fruits have already ripened (Fertig 1998).

The three largest private land populations of Colorado butterfly plant observed in 1998 were all found in areas that had been mowed in mid summer or late fall (Fertig 1998). Furthermore, Munk (1999) observed that Colorado butterfly plant regeneration may be increased with removal of heavy grass cover. Munk (1999) also observed increased branching of floral stems when the terminal bud was removed and apical dominance released with grazing of Colorado butterfly plant by pronghorn antelope. Although bolted plants (those plants where the flowering stalk has emerged and is actively growing) are frequently grazed by cattle (Munk 1999), rosettes receive little defoliation by grazing cattle, most likely due to the fact that rosettes "hug" the ground and cattle are not able to reach them.

Construction of stock ponds and reservoirs, conversion of rangeland to crop cultivation, and the loss of habitat to residential and urban development are also important threats in agricultural areas. The cities of Cheyenne, Wyoming and Fort Collins, Colorado contain areas of formerly suitable Colorado butterfly plant habitat that have been lost to urbanization. The protection or continued agricultural management of suitable private land habitat may also be critical to the long-term survival of the Colorado butterfly plant (Fertig 1998).

In non-agricultural settings, the greatest threat to the Colorado butterfly plant may be the changes in habitat suitability resulting from natural succession. Without periodic disturbance events, the semi-open habitats, preferred by this subspecies may become choked by tall and dense growth of willows, gramminoids, and exotic weeds (Fertig 1994). Natural disturbance events such as

flooding, fire, and ungulate grazing, may have been sufficient in the past to create favorable conditions. In the absence of such events today, managed disturbance may be necessary to maintain and create areas of habitat (Fertig 1994, 1996, 1998)

Because of the small, isolated nature of populations and few numbers present in many of them, the subspecies is much more susceptible to random events such as fires, insect or disease outbreaks, or other unpredictable events that could easily eliminate local populations (USFWS 2004c). High recreational use by campers, motorists, and fishermen is a threat to populations on State park lands in Nebraska.

Alterations of stream hydrology could also threaten Colorado butterfly plant. The plant is supported by moist soil throughout the growing season, and by wet habitats that are dominated by grass/forb/sedge communities. During the past 150 years, and continuing today, water developments, diversions, stream channel alterations for flood control or other purposes (including oil and gas development and mining), and changes in hydrograph have altered hydrology, floodplain geomorphology, and vegetation composition and trends. While in some streams and reaches this may have provided improved conditions for the plant, in many cases, it has resulted in the loss of suitable habitat and likely fragmentation of the habitat or loss of the plant within watersheds (USFWS 2004c).

Critical Habitat

Critical habitat is defined in section 3(5)(A) of the Act as (i) 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 (I) essential to conserve the species and (II) that may require special management considerations or protection; and (ii) 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. "Conservation" means the use of all methods and procedures that are necessary to bring an endangered or threatened species to the point at which listing under the Act is no longer necessary. In accordance with sections 3(5)(C) of the Act, not all areas that can be occupied by a species will be designated critical habitat. Within the geographic area occupied by the species we designate only areas currently known to be essential.

This biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 302.02. Instead, we have relied upon the statute and the August 6, 2004, Ninth Circuit Court of Appeals decision in *Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service* (No. 03-35279) to complete the following analysis with respect to critical habitat.

In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12, in determining which areas to designate as critical habitat the Service based critical habitat determinations on the best scientific and commercial data available and to consider physical and biological features (primary constituent elements) that are essential to conservation of the species, and that may require special management considerations and protection. These physical and biological features include, but are not limited to: (1) space for individual and population growth, and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, rearing, (or development) of offspring; and (5) habitats protected from disturbance or that are representative of the historic geographical and ecological distributions of a species.

Critical habitat receives protection under section 7 of the Act through prohibition against destruction or adverse modification of critical habitat with regard to actions carried out, funded, or authorized by a Federal agency. In regulation 50 CFR 402.02, destruction or adverse modification of critical habitat is defined as "a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical." Aside from the added protection that may be provided under section 7, the Act does not provide other forms of added protection to lands designated as critical habitat. Because consultation under section 7 of the Act does not apply to activities on private land or non-Federal lands that do not involve a Federal nexus, critical habitat designation does not result in any regulatory requirements for these actions.

Colorado Butterfly Plant Critical Habitat Designation

Critical habitat for the Colorado butterfly plant has been designated in Laramie and Platte counties, Wyoming (70 FR 1940; USFWS 2005). In total, approximately 3,538 acres along 51 stream miles fall within the boundaries of the critical habitat designation. Management considerations for the Colorado butterfly plant include: maintaining surface and subsurface water flows that provide the essential hydrological regime that supports the species; appropriate restraints on application of herbicides used to control noxious weeds; preventing habitat degradation caused by plant community succession; and preventing harmful habitat fragmentation from residential and urban development that detrimentally affects plant-pollinator interactions, leads to a decline in species reproduction, and increases susceptibility to non-native plant species.

Colorado Butterfly Plant Critical Habitat Primary Constituent Elements

The primary constituent elements (PCEs) for the Colorado butterfly plant critical habitat include those habitat components essential for the biological needs of rosette growth and development, flower production, pollination, seed set and fruit production, and genetic exchange. The PCEs for the Colorado butterfly plant are: (1) subirrigated, alluvial soils on level or low-gradient floodplains and drainage bottoms at elevations of 5,000 to 6,400 ft; (2) a mesic moisture regime, intermediate in moisture between wet, streamside communities dominated by sedges, rushes, and cattails, and dry upland shortgrass prairie; (3) early- to mid-succession riparian (streambank or riverbank) plant communities that are open and without dense or overgrown vegetation (including hayed fields that are disced every 5-10 year at a depth of 8-12 inches, grazed pasture, other agricultural lands that are not plowed or disced regularly, areas that have been restored after past aggregate extraction, areas supporting recreation trails, and urban/wildland interfaces); and (4) hydrological and geological conditions that maintain stream channels, floodplains, floodplain benches, and wet meadows that support patterns of plant communities associated with the Colorado butterfly plant.

Existing features and structures within the boundaries of the mapped units, such as buildings, roads, parking lots, other paved areas, landscaped areas, regularly plowed or disced agricultural areas, and other features not containing any of the PCEs are not designated as critical habitat.

Special Management Considerations or Protections for Colorado Butterfly Plant Critical Habitat

When designating critical habitat for the Colorado butterfly plant, the Service assessed the areas where the PCEs were found and which may require special management considerations or protections. For the Colorado butterfly plant, special management considerations include maintaining existing management regimes that produce surface or subsurface water flows that provide the essential hydrological regime that supports the species; appropriate application of herbicides used to control noxious weeds; and preventing harmful habitat fragmentation from residential and urban development that detrimentally affects plant-pollinator interactions, local hydrologic patterns and moisture regimes, leads to a decline in species reproduction, and increases susceptibility to overgrowth by non-native plant species. While excessive grazing can lead to changes in essential habitat conditions (e.g., increases in soil temperature resulting in loss of moisture, decreases in plant cover, and increases in non-native species), managing for appropriate levels of grazing provides an important management tool with which to maintain open habitat needed by the Colorado butterfly plant.

The Service designated a total of seven units as critical habitat for Colorado butterfly plants. The critical habitat areas described below constitute the Service's best assessment at the time of designation of the areas essential for the conservation of the Colorado butterfly plant. All units are located in Wyoming. The units are (1) Tepee Ring Creek; (2) Bear Creek East; (3) Bear Creek West; (4) Little Bear Creek/Horse Creek; (5) Lodgepole Creek West; (6) Lodgepole Creek East; and (7) Borie.

Existing features and structures within the boundaries of the mapped units, such as buildings, roads, parking lots, other paved areas, lawns, other urban and suburban landscaped areas, regularly plowed or disced agricultural areas, and other features not containing any of the primary constituent elements are not considered critical habitat.

Threats to Primary Constituent Elements of Colorado Butterfly Plant Critical Habitat.

When designating critical habitat, the Service chose areas that had the greatest potential in aiding in the recovery of the species. Therefore, these areas currently have adequate primary constituent elements and have minimal threats to them at this time. Identified threats to some critical habitat units include: (1) Section 4(b)(8) of the Act, requires the Service to identify activities that may adversely modify critical habitat. Federal actions that, when carried out, funded or authorized by a Federal agency, may destroy or adversely modify critical habitat for Colorado butterfly plant include but are not limited to: (1) any activity that results in development or alteration of the landscape within a unit, including clearing; activities associated with construction for urban and industrial development, roads, bridges, pipelines, or bank stabilization; agricultural activities such as plowing, discing, haying, or intensive grazing; off-road vehicle activity; and mining or drilling of wells; (2) any activity that results in changes in the hydrology of the unit, including construction, operation, and maintenance of levees, dams, berms, and channels; activities associated with flow control (e.g., releases, diversions, and related operations); irrigation; sediment, sand, or gravel removal; and other activities resulting in the draining or inundation of the unit; (3) any sale, exchange, or lease of Federal land that is likely to result in the habitat in a unit being destroyed or appreciably degraded; (4) any activity that detrimentally alters natural processes in a unit including the changes to inputs of water, sediments and nutrients, or that significantly and detrimentally alters water quantity in the unit;

and (5) any activity that could lead to the introduction, expansion, or increased density of exotic plant or animal species that are detrimental to the Colorado butterfly plant and its habitat.

Ute Ladies'-tresses Species Description

Ute ladies'-tresses (*Spiranthes diluvialis*) is a perennial, terrestrial orchid with stems 20 to 50 centimeters (cm) tall arising from tuberously thickened roots measuring up to 1 cm in diameter. It has narrow leaves about 28 cm long and 1.5 cm wide at the base of the stem and becomes reduced in size going up the stem. The flowers, in an inflorescence (flowering spike) of 3 to 30 or more flowers, are small white to ivory arranged in a spiral. The species is characterized by stout flowers that are gaping at the mouth. The sepals and petals, except for the lip, are straight, although the lateral sepals are variably oriented. These lateral sepals spread abruptly from the base of the flower and are free to the base. The rachis is densely pubescent with the longest trichomes, or hairs, 0.2 millimeters long or longer (Sipes and Tepedino 1994, USFWS 1992b, 1995a).

Ute Ladies'-tresses Life History

Very little is known about the life history of Ute ladies'-tresses (USFWS 1995a). Much of what is presumed about the species' life history is drawn from knowledge of other orchids. Orchids generally have very small seeds that require symbiotic associations with mycorrhizal fungi for germination. Many species of orchids are saprophytic, underground plants that may persist for many years underground before emerging above ground. The mycorrhizal stage is reported to last 8 years in *S. spiralis* and green leaves are first produced up to 11 years after germination in that species (Wells 1967). Studies of *S. magnicamporum* in western Kansas and Nebraska report that that species may bloom as rarely as once in 20 years. The mean life expectancy of *S. spiralis* plants studied over a nine year period was calculated to be more than 50 years (USFWS 1995a).

Throughout its range, reproduction of the Ute ladies'-tresses orchid appears to be strictly sexual, with bumblebees (*Bombus* spp.) as the primary pollinators (Arditti 1992, Sheviak 1984). Flowers are protandrus (functionally male first and then female). As with other orchid species, it is thought that Ute ladies'-tresses does not reach sexual maturity for 5 to 10 years (USFWS 1995a). Each orchid fruit can have several hundred to 10,000 seeds with an average of around 2,000 (Sipes and Tepedino 1994). These seeds may be dispersed by water (Carroll, *pers. comm.*) or wind (Wells 1967). The flowers, seed heads, and vegetative parts of the Ute ladies'-tresses orchid are palatable and can be incidentally eaten by grazing livestock. The possibility that grazers could disperse the seeds of this species has not been evaluated. The blooming period is from early August to early September, with fruits produced in mid-August to September (Fertig 2000a). Not all individual mature Ute ladies'-tresses orchids bloom every year and some may remain dormant beneath the ground surface and not show any above ground parts for at least one growing season (Arft 1995).

Populations of Ute ladies' tresses may do well under a regime of somewhat heavy use, i.e., livestock grazing and hay mowing. Grazing may have beneficial effects to the plants, especially in early summer prior to flowering or fruit production (Arft 1995, Moseley 1998). Grazing may mimic the effects of flooding, fire, or other disturbances in maintaining low vegetative cover or reducing weed cover (Moseley 1998). Mowing may be beneficial by reducing competing vegetation cover, but can be detrimental if done before fruits ripen or if hay is cut too low (Arft

1995; Hazlett 1996, 1997). Ute ladies'-tresses does not tolerate dense competition of vegetation, although a few populations are found in riparian woodlands.

The Ute ladies'-tresses orchid inhabits early successional riparian habitats such as moist stream beds, wet meadows, point bars, sand bars, abandoned stream channels, and low lying gravelly, sandy, or cobbley edges (Fertig *et al.* 1994, USFWS 1995a, Fertig 2000a). Ute ladies'-tresses appears to have a close affinity with floodplain areas where the water table is near the surface throughout the growing season and into early autumn. The species is found in open riparian, floodplain areas where the competing vegetation has been removed by livestock grazing, mowing or by flooding events approximately one month prior to flowering. Ute ladies'-tresses is known to grow in agricultural lands managed for grazing in the winter and hay production in spring and summer, where mowing occurs in mid-July (USFWS 1995a). The elevational range of known Ute ladies'-tresses occurrences is 1800-6800 feet (Arft and Ranker 1998), while the known Wyoming populations range from 4650-5420 feet (Fertig 2000a).

Ute Ladies'-tresses Population Dynamics

Ute ladies'-tresses population levels and viability are, at least in part, determined by habitat conditions created and maintained by natural water processes. Therefore, the significance of population size and distribution within a watershed can, at least partially, be assessed in terms of the ability of the watershed factors to perpetuate it. However, the linkages between watershed processes, habitat conditions, and Ute ladies'-tresses population response are complex and not completely understood.

The locations of populations within a watershed vary with the availability of suitable habitat. Sizes of populations fluctuate naturally. Some years not a single Ute ladies'-tresses individual appears above ground. The number of flowering adults does not give an accurate picture of population size nor tell us anything about population structure. More information is necessary regarding population viability (USFWS 1995a).

If estimated population size is based on the number of Ute ladies'-tresses flowering spikes, then populations appear to fluctuate dramatically in size from year to year (USFWS 1992b). For example, the primary site for the Boulder, Colorado population contained 5,435 plants in 1986, 200 plants in 1987, 131 plants in 1988, 1,137 plants in 1989, 1,894 plants in 1990, and at least 80 plants in 1991 (USFWS 1992b). This variability in apparent population size is consistent with other observations made of other orchid species.

However, Wells (1967) questions that apparent fluctuations in orchid numbers are accurate descriptions of the actual dynamics of the orchid populations. According to Wells (1967), the criterion adopted for judging whether the number of orchids at a site has changed or not has been the number of flowering spikes displayed at the time of visit. This may be an unsatisfactory criterion for measuring a quantitative change in population because, as has been demonstrated, plants may spend several years as vegetative rosettes or as underground tubers (as many as 11 years) with no above-ground parts. Furthermore, according to Wells (1967), the autumn ladies'-tresses orchid (*S. spiralis)* grows mainly in short grassland which is typically maintained in that condition by some kind of grazing which can damage some of the flowering spikes making a visual estimate of number based on count of flowering spikes unreliable. Arft's (1995) work on Ute ladies'-tresses supports this theory as well.

At the time of listing of Ute ladies'-tresses, most of the species' historic western populations on the Wasatch Front and in the Great Basin were believed to have been extirpated by urbanization. Most known populations contained fewer than 1,000 plants when counted in 1990 and 1991. Eastern Utah populations were also typically small in size. Local extirpations may have taken place in currently unoccupied potential habitat similar to extirpations which occurred along the Wasatch Front, the Great Basin, and certain historic populations in Colorado (USFWS 1992b).

In 1992, when the species was listed, the total known population size of Ute ladies'-tresses was fewer than 6,000 individuals from 11 known populations in Colorado, Utah, and Nevada (USFWS 1992b). The January 17, 1992, listing of Ute ladies'-tresses resulted in an increase in surveys for the species. Since that time, additional populations have been located in Utah, Montana, Idaho, Nevada, Colorado, Nebraska, Washington, and Wyoming. In 1995, the total known population size of Ute ladies'-tresses was approximately 20,500 individuals (USFWS 1995a). Since 1995, another 24 populations have been discovered, including several large occurrences along the Green River in Colorado and Utah, the Snake River in Idaho, and Niobrara River in Wyoming and Nebraska. Ute ladies'-tresses are now known to occupy 674-783 acres of habitat. The highest number of plants recorded in any one year was 38,438 in 1998, based on sampling 23 of 55 populations known at that time. Since these populations were not selected randomly, no useful extrapolations can be made to estimate rangewide numbers based on annual counts (Fertig *et al.* 2005).

Ute Ladies'-tresses Status and Distribution

On January 17, 1992, the Service listed Ute ladies'-tresses as threatened in its entire range under the Act (57 FR 2053). The Ute ladies'-tresses was first described as a species in 1984 by Dr. Charles J. Sheviak from a population discovered near Golden, Colorado (Sheviak 1984). At the time of its listing, Ute ladies'-tresses was known from 11 populations occurring in Colorado, Utah, and Nevada. Critical habitat has not been designated at this time. To date, no recovery plan has been approved for this species. However, a draft recovery plan has been written (USFWS 1995a).

Ute ladies'-tresses was first discovered in Wyoming by the University of Wyoming, Rocky Mountain Herbarium in 1993. Formal surveys for Ute ladies'-tresses then began in Wyoming in 1994, one year after B. Ernie Nelson, manager of the Rocky Mountain Herbarium, discovered the state's first population in Goshen County. Nelson, staff from the Rocky Mountain Herbarium, and graduate students conducted general floristic surveys in southeast Wyoming, the Green River Basin, and Laramie Basin from 1994-1999, finding an additional new colony along Antelope Creek in Converse County in 1994 (Hartman and Nelson 1994). The population on Antelope Creek occurs on Bureau-administered land in the Casper Resource Area north of the Rawlins Resource Area. This population has been censused several times and has remained small (11-35 plants seen during various years). The habitat there is considered marginal and the Antelope Creek population is considered the least viable of the populations within Wyoming (Fertig 2000a).

Hartman and Nelson (1994) found that populations discovered in Wyoming occurred on terraces, low slopes, and oxbows adjacent to small streams on sandy to coarse gravelly alluvium or alkaline clays in wet meadow communities (Nelson and Hartman 1995). Based on short-term observation data, the populations that they found were thought to be stable or increasing. The sites were on lands managed for livestock grazing or hay production. Current land uses at the

time appeared compatible with the habitat needs of Ute ladies'-tresses orchid populations. The timing of grazing and mowing was thought to be critical for successful seed production (Fertig 2000a).

Surveys since 1992 have expanded the number of vegetation and hydrology types occupied by Ute ladies'-tresses to include seasonally flooded river terraces, subirrigated or spring-fed abandoned stream channels and valleys, and lakeshores. In addition, 26 populations have been discovered along irrigation canals, berms, levees, irrigated meadows, excavated gravel pits, roadside barrow pits, reservoirs, and other modified wetlands. New surveys have also expanded the elevational range of the species from 720-1830 feet (220-558 meters) in Washington to 7000 feet (2134 meters) in northern Utah (Fertig *et al.* 2005).

Through coordination with and cooperation from a private landowner, Don Hazlett was granted permission in 1996 to search an area along the Niobrara River in Sioux County, Nebraska. Hazlett (1996) counted several thousand Ute ladies'-tresses (Hazlett 1996). The area was previously mown in July of that year for hay and thousands of Ute ladies'-tresses were flowering in the pasture apparently flourishing from the reduced competition following the mowing and baling. The discovery was the first reported case of *S. diluvialis* in the state of Nebraska. Future plans for that area are to maintain it as a working ranch or as a youth camp/nature preserve for young people (Hazlett 1996).

Walter Fertig and George Jones of the Wyoming Natural Diversity Database (WYNDD) surveyed public lands in Jackson Hole and the lower Green River Basin in 1999, but did not find any new *S. diluvialis* sites. Staff of the WYNDD also conducted unsuccessful searches in the Powder River Basin, National Elk Refuge, and F.E. Warren Air Force Base from 1995-1997.

Various environmental consulting firms (e.g., ERO Resources 1994) have searched for *S. diluvialis* across Wyoming since 1994. These efforts have not documented any new colonies (Fertig 2000a). Because of the plant's irregular flowering pattern, sites which have been surveyed in the past could still harbor populations (Fertig 2000a).

To date, no populations have been discovered on land administered by the Bureau in the Rawlins Resource Area (BLM 2005e). Since their discovery in Wyoming, Ute ladies'-tresses populations have been located in Goshen, Converse, Laramie, and Niobrara counties of southeastern Wyoming. The Ute ladies'-tresses orchid is currently known from a small population along a tributary to Antelope Creek (a tributary to the Cheyenne River) in northwest Converse County; a population along Bear Creek in southwestern Goshen County; a population along the Niobrara River near McMaster's Reservoir in southeastern Niobrara County; a population along Sprager Creek in Laramie County, and a recently discovered population along Horse Creek in Laramie County. These populations are monitored on a limited basis and appear to be stable (USFWS 2002).

However, surveys have yet to be conducted on all potential existing orchid habitat on Bureau-administered lands within the Rawlins Resource Area. The variability of Ute ladies'-tresses emerging and flowering every year, makes it difficult to effectively locate populations and inventory them. Future surveys in the Rawlins Resource Area may find populations of Ute ladies'-tresses on Bureau-administered surface and/or split-estate lands on potential habitat along streams, rivers, and riparian areas with sandy or loamy clay soils.

Ute Ladies'-tresses Threats

In 1992, the Service identified habitat loss and alteration (through urbanization, water development, residential development, conversion of open space to parks, agricultural activities); overutilization for commercial, recreational, scientific, or educational purposes; excessive livestock grazing (although mild to moderate grazing may be beneficial); inadequacy of existing regulatory mechanisms; and other factors including localized catastrophic events, competition with invasive plant species, and indiscriminate use of herbicides as the primary threats to the long term conservation of this species. These activities historically have likely been a primary cause of the fragmentation of populations now currently observed. Fertig *et al.* (2005) identified additional threats including ecological succession, road and other construction, recreation, flooding, haying/mowing, natural herbivory, loss of pollinators, and drought. There is increasing pressure for urban, residential, and recreational development in these wetland and riparian areas, especially along the Front Range of Colorado and the Wasatch Front in Utah. As these areas are typically in private ownership, and the projects are often privately funded, there is very little regulatory protection for the orchid there, even though it is a Federally-listed species.

Incompatible agricultural or other land management practices could also threaten the Ute ladies'-tresses orchid. The orchid is quite tolerant of grazing and other forms of land and vegetation disturbance. However, continuous grazing during the flowering season, severe trampling and soil compaction, untimely herbicide applications, proliferation of aggressive native and exotic plant species indicative of site degradation, and practices that result in habitat alteration from grass/forb/sedge to shrub/tree dominance, can result in loss of vigor and eventual demise of the orchid and/or orchid pollinators. Many riparian and other wetland and wetland/upland habitats suffer from these impacts, as well.

Alterations of stream hydrology could also threaten Ute ladies'-tresses. The orchid is supported by moist soil throughout the growing season, and by wet habitats that are dominated by grass/forb/sedge communities. During the past 150 years, and continuing today, water developments, diversions, stream channel alterations for flood control or other purposes (including oil and gas development and mining), and changes in hydrograph have altered hydrology, floodplain geomorphology, and vegetation composition and trends. While in some streams and reaches this may have provided improved conditions for the orchid, in many cases it has resulted in the loss of suitable habitat and likely fragmentation or loss of the orchid within watersheds (USFWS 2004b). Although some Bureau-authorized activities may affect stream hydrology, the Bureau in the Rawlins Resource Area is committed to not authorizing activities that might affect the hydrology of occupied Ute ladies'-tresses habitat (Appendix I).

Blowout Penstemon Species Description

The blowout penstemon (*Penstemon haydenii*), a member of the snapdragon family, is a hairless perennial that grows 1 to 2 feet high. The stems are often decumbent, simple, or branched, and very leafy. The stem leaves are linear to lanceolate, entire, 3 to 5 inches long by 1 to 3 inches wide, sessile and clasping. The inflorescence is a compactly crowded thyrse. A thyrse is composed of (1) a main axis of an inflorescence made up of flowers born on stalks of about equal length along an elongated axis that continues to grow during flowering and open in succession from below and (2) secondary and later axes of the inflorescence that terminate in single flowers. Floral bracts are ovate to lanceolate, nearly equaling the flowers. The corolla is

milky blue to pale lavender (rarely pink or white) and 1.5 to 2 inches long. The sterile staminode is glabrous and/or hairy. Fruits are 0.5 to 0.6 inch long capsules, acute, with light brown, disc-shaped seeds having winged margins (Heidel 2005c, USFWS 1987).

Blowout Penstemon Life History

All known blowout penstemon sites are well-developed blowouts in dune complexes with active sand and accompanying environmental extremes in wind, temperature, evapotranspiration, and soil moisture stress. Blowout penstemon plants are most frequently found in microsites that are, or recently have been, zones of sand accumulation. The plant apparently is successional and is a pioneer species that does not persist when a sand blowout becomes completely vegetated. The species survives burial in sand by sending off shoots at successively higher nodes. It withstands initial erosion and has a rhizomatous system with extensive lateral roots to survive erosion that may uncover much of its root length.

Blowout penstemon is generally found in sparsely vegetated, early successional, shifting dunes with crater-like blowout depressions created by wind erosion (Stubbendieck *et al.* 1989). In Wyoming, this plant is found primarily on the rim and lee slopes of blowouts or the rim and steep sides of sandy slopes situated at the bases of mountains or ridges. Associated vegetation includes blowout grass (*Redfieldia flexuosa* (Thurb.) Vasey), thickspike wheatgrass (*Elymus macrourus*), lemon scurfpea (*Psoralidium lanceolatum*), Indian ricegrass (*Achnatherum hymenoides*), and western wheatgrass (*Pascopyrum smithii*). Known populations in Wyoming are found between 5860-7440 feet (Fertig 2001b, Heidel 2005c).

The species flowers from mid-May to late June in Nebraska. The flowers have a strong, persistent fragrance that lures several kinds of bees and other pollinators. The fruit (capsule) matures and splits in early to mid-August and the seeds either fall near the base of the plant or are transported primarily by wind to other areas within the blowout or outside of the blowout. All healthy flowering plants are thought to produce seed (USFWS 1992a). Most blowout penstemon plants begin to bloom at 2 to 3 years of age (Stubbendieck *et al.* 1993) and have been successfully cultivated in the greenhouse (Flessner and Stubbendieck 1989, 1992). Flowering in Wyoming occurs later than in Nebraska (late June to early July), probably in response to drier and cooler climatic conditions (Fertig 2001b).

Each fruit of the blowout penstemon contains an average of 25-35 seeds with as many as 1500 seeds per plant. The seeds are winged presumably to aid in wind dispersal although, given the high degree of herbivory of this plant, some questions have been raised that animals might also be an important avenue of seed dispersal (Heidel 2005c). Seeds are released from late August through September. The seeds, potentially remaining dormant in the sand for 20 years, have a thick outer coat and germination is enhanced after some degree of scarification. Axillary root branching may be an adaptation to survive burial by wind-blown sand rather than a common form of reproduction. By digging around individual blowout penstemon plants, Heidel (2005b) did not find evidence of long-distance underground connectivity between adjacent plants.

At least eight distinct genetic markers were found in blowout penstemon populations in Nebraska indicating a degree of genetic variation not indicative of a population that has undergone a high degree of inbreeding. Presumably, Nebraska populations, although fragmented and isolated at present, did have high levels of gene flow between populations in the past.

A comparison study of the genetics of the Nebraska and Wyoming populations has been undertaken. Preliminary data indicate that there is little divergence between the populations of these two states (Caha *et al.* 1998).

Blowout Penstemon Population Dynamics

Rangewide, the blowout penstemon is currently known from approximately 17,550 plants. In Nebraska, there are 13 indigenous populations (approx. 3,050 plants) and 18 nonindigenous (transplanted) populations (approx. 8,050 plants). In Wyoming, three indigenous populations are made up of at least 6,450 plants based on a combination of census and rough estimates in 2004 (Heidel 2005c).

Annual population census data have been collected since 1985 for Nebraska populations and population trend data in Wyoming have been gathered since 2001 at two of the 18 occupied blowouts. Preliminary data of Wyoming populations suggest that Wyoming populations are stable or increasing (Heidel 2005c). The largest Wyoming population had at least 11 separate blowout areas spanning approximately 164 acres, in a scattered pattern over an 8 square mile area. This population had at least 5,900 plants in 2004. It was expanded in 2005 by documenting four additional occupied blowouts and expanding the census (Heidel personal communication). An updated memo reporting numbers and extent is pending. In Nebraska, it is known that population sizes fluctuate annually, depending on recruitment success and mortality. Historically, blowout penstemon populations in Nebraska have experienced sharp declines. Wildfire control, severe drought, soil stabilization practices, leveling and revegetating of sand dunes and outbreaks of pyralid moths have been identified as potential causes of the decline there (Heidel 2005c).

Blowout penstemon plants are unevenly distributed across their habitat. They occur in sparse clusters that may correspond with habitat preferences. In Nebraska, plant density can range from one plant per square meter to one to two plants per several hundred meters. In Wyoming, density can be as high as two to three mature plants per square meter. Subpopulations can contain from 10 plants to nearly 2000 plants (Heidel 2005c).

Blowout Penstemon Status and Distribution

The blowout penstemon was listed as endangered on September 1, 1987 (USFWS 1987; 52 FR 32926-32929). At that time, the blowout penstemon was only known to exist in Nebraska and was considered endemic to that State. The blowout penstemon was discovered in Wyoming in 1996. Since their discovery in Wyoming, surveys have revealed the presence of at total of three populations in the State.

The plant's current known range in Wyoming consists of the sand dunes in northwest Carbon County of the Bureau's Rawlins Resource Area where the plants are restricted to shifting sand dunes and wind-carved, crater-like depressions (blowouts) with sparse cover of blowout grass and lemon scurfpea. The blowout penstemon populations in Wyoming are located at higher elevations, and have lower mean annual precipitation and cooler summer temperatures than the sites occupied by the species in Nebraska. Wyoming populations also differ from those of Nebraska in being restricted to sand dunes associated with mountain slopes, rather than broad valleys (Fertig 2001b).

In Wyoming, populations are specifically found (1) on the northwest flank of Bradley Peak in the western Seminoe Mountains, (2) on the south slope of Bear Mountain and north side of Junk Hill at the eastern end of the Ferris Mountains, and (3) at the foothills of the Pedro Mountains that extend on the west side of the Pathfinder Reservoir (Heidel 2005c). In Nebraska, the species is present in the sandhills of Cherry, Hooker, Box Butte, Sheridan, and Garden Counties. Many historic locations of blowout penstemon populations in Nebraska do not support the species presently. This is due, at least in part, to the elimination of habitat caused by stabilization of the sand dunes through range improvement practices (Fertig 2001b).

Blowout Penstemon Threats

In Wyoming, the three known populations of blowout penstemon are in remote, fairly unutilized and seldom accessed locations of the Bureau's Rawlins Resource Area. These areas have received little management in the past. Given the nature of the different habitats occupied by blowout penstemon plants in Nebraska as compared to those in Wyoming, the degree of threat to populations in these two states may differ. When the blowout penstemon was listed as endangered under the Act, only the Nebraska populations were known, therefore only the threats to populations in Nebraska were considered and used as the basis for this plant's determination of endangered status. The rangewide threats to the blowout penstemon currently include: (1) mining, (2) water development, (3) oil and gas leasing, (4) off-road vehicle use, (5) changes in habitat quality, (6) livestock trampling and grazing, (7) over-collection, (8) pesticide use, (9) construction activities, (10) vulnerability based on small population size, and (11) encroachment by other plants.

Mining. Sand mining is currently not occurring in close proximity to any blowout penstemon sites, however more accessible sand deposits in the Rawlins Resource Area are currently being mined. The sand mined from those locations is used for golf courses and road maintenance. Presently, it seems impractical for sand mining to occur near blowout penstemon sites because of their relative isolation, rugged terrain, and limited access. Blowout penstemon populations in Wyoming are located over 7 miles from primary unpaved county roads to the north and east, and at least 15 miles from primary county roads to the west. Future changes in the accessibility to these habitats could affect the profitability and establishment of sand mines near blowout penstemon sites. Other valuable minerals located near the Seminoe Mountains to the south of the blowout penstemon populations include iron, copper, and gold (from Hausel 1989, in Heidel 2005c).

Water Development. Near blowout penstemon habitat at Bradley Peak, Bear Mountain, and Junk Hill in Wyoming are excavated ponds, as well as natural ponds and springs used for sources of livestock water. It would not be feasible to develop these water sources as irrigation water for cultivated fields or central pivot irrigation as is done in Nebraska. Nevertheless, further livestock water sources developed near blowout penstemon populations could potentially concentrate livestock near these habitats causing increased grazing or trampling effects to the plants (Heidel 2005c).

Oil and Gas Leasing. Currently, there are no oil and gas development activities occurring among blowout penstemon populations in Wyoming. The closest oil and gas activities to the populations occur less than 1.0 mile southwest of the Bear Mountain - Junk Hill population (Heidel 2005c). As oil and gas exploration in Wyoming is currently occurring at an elevated and

expanded rate over much of Wyoming, and pipelines are developed, it is conceivable that oil and gas development interests could conflict with blowout penstemon populations in the future.

Off-Highway Vehicle Use. Off-highway vehicle (OHV) use has been observed within a blowout penstemon population in Nebraska, and many plants were damaged (USFWS 1992a). Hill climbing and associated OHV recreation activities may ensure continued disturbance and erosion of the sand hills and dunes, but driving over and crushing plants may cause severe negative impacts to the plants (USFWS 1992a).

During blowout penstemon surveys in Wyoming, OHV tracks were observed in blowout penstemon habitat. These were observed twice during surveys in 2004 and once in 2003 (Heidel 2005c). One of these observations appeared to be an OHV rider riding directly through the dune. Another incident involved riding directly to the dune though there were no trail patterns that indicated recreational use. The third pattern involved OHV play in the bottom of a crater which did not contain blowout penstemon plants although the species was located on the rim above (Heidel 2005c).

The Bureau has recently committed to limiting the use of OHVs to designated roads and trails within 1.0 mile of known blowout penstemon populations, with no exceptions for the "performance of necessary tasks" other than fire fighting and hazardous material cleanup (see Appendix I). Any OHV use in the future near blowout penstemon plants, similar to that which was observed in 2003 and 2004, would be a prohibited, unauthorized activity and subject to fines and penalties as determined by the Bureau's enforcement personnel. If a private individual (for example, an OHV user) does perform a prohibited, unauthorized activity on the Bureau's property, the Bureau does not have discretionary authority over that person's actions (although Bureau enforcement personnel can issue citations and fines). This section 7 consultation deals only with activities over which the Bureau has discretionary authority as described in its RMP and committed conservation measures. This section 7 consultation does not analyze the effects of prohibited activities undertaken by private individuals, at their own discretion, contrary to Bureau regulations.

Changes in Habitat Quality. Historically, fires removed the protective cover from the soil in the Nebraska Sandhills region resulting in shifting sand dunes and blowouts. Control of prairie fires followed the area's settlement period. Virtual elimination of fire from the Sandhills ecosystem allowed the vegetation to advance into the majority of the eroded areas and to stabilize the sand, resulting in a decline in suitable habitat for the species (USFWS 1992a). However, continual summer grazing by cattle during the first half of this century caused enough disturbance to maintain many blowouts. More recently however, the increased use of planned grazing systems (rotational grazing) during the past 30 years has greatly reduced disturbance and has been responsible for decreasing wind erosion. Other advanced range management practices in Nebraska, including techniques to more evenly distribute livestock on rangeland, have been responsible for decreasing blowout penstemon habitat, as well as the numbers of populations, and the numbers of individual plants (USFWS 1992a).

In Wyoming, the known blowout penstemon populations are located on lands managed by the Bureau as Full Fire Suppression areas. The areas surrounding the occupied habitat, as well as the occupied habitat are sparsely vegetated. The impact that fire suppression activities have had on blowout penstemon populations in Wyoming are unknown at this time.

Livestock Trampling and Grazing. Sheep previously grazed the allotments occupied by blowout penstemon in Wyoming. Cattle and horses are now commonly found on the rangelands of both Nebraska and Wyoming. The influence of horses on blowout penstemon has not been documented. Cattle, however, have frequently been observed near blowout penstemon plants. Many individual plants have been inspected during and after cattle grazing periods. When adequate other forage is available, cattle occasionally graze a portion of a plant but seldom does this cause major damage to the plant (BLM 2005c, USFWS 1992a). Under these normal range conditions, the use of high livestock stocking rates as a disturbance factor to maintain habitat for the blowout penstemon is considered beneficial (USFWS 1992a). Advanced grazing methods, referred to as "holistic resource management", may further decrease blowout penstemon habitat by reducing active erosion. Techniques which more evenly distribute livestock on rangelands such as "planned grazing systems" or "management intensive grazing" may have been responsible for decreasing blowout penstemon habitat, numbers of populations, and numbers of individual plants in Nebraska (USFWS 1992a).

The occasional removal of a terminal portion of a shoot of a blowout penstemon plant by a grazing herbivore may be desirable because growth of other shoots is stimulated (USFWS 1992a). However, during years of low precipitation, livestock forage may be limited and blowout penstemon plants may be more intensively grazed during those times. In Nebraska during times of limited forage availability, cattle have been observed to closely graze nearly every available blowout penstemon plant. One occurrence of close grazing by cattle may or may not impact blowout penstemon plants, but repeated years of close grazing will severely weaken plants and may be the direct cause of plant death (USFWS 1992a) or reduce population numbers. Cattle trampling of established plants has not been observed to be a problem. Infrequently, cattle will break a blowout penstemon shoot, which poses no threat to the plant (USFWS 1992a).

Livestock trampling damage is typically not significant to blowout penstemon plants because the plants are sparsely distributed in shifting substrate areas which cattle do not normally frequent. For Wyoming populations, it has been hypothesized that wildlife are the primary source of blowout penstemon herbivory. Wild ungulates, such as deer and elk, may have a larger grazing impact on blowout penstemon plants than cattle in Wyoming. Fertig (2001b) observed stem damage from deer and elk trampling on 10 percent of the population at Bear Mountain and on 60 to 80 percent of the stems at Bradley Peak. The tracks of elk and pronghorn antelope were repeatedly observed near browsed plants during recent survey efforts in Wyoming (Heidel 2005c).

Over-collection. The blowout penstemon is attractive and has been cultivated. Horticultural collecting is a potential threat for this species (USFWS 1987). To date, private and commercial collectors have had little impact on blowout penstemon. It would be an attractive and desirable landscape plant, but most of the plants are in locations which are too remote or inaccessible (USFWS 1992a).

Pesticide Use. No research has been conducted on the influence of herbicides on blowout penstemon. It is highly probable that broadleaf weed killers would negatively influence this plant. Fortunately, herbicides are seldom used on sand hills/dune regions. It is doubtful that ranchers would even inadvertently apply herbicide to blowout penstemon, because most ranchers try to encourage the growth of all vegetation in blowouts. Use of insecticides could negatively impact the pollinators of blowout penstemon. Numerous types of insects may be responsible for pollination; however, it is unlikely that localized insecticide use would completely eliminate

insect pollination. It is important to note that some blowout penstemon plants are self-pollinating. Therefore complete eradication of insects would not stop all seed production (Heidel 2005c).

Non-native species recorded in 2005 for the first time in or adjoining blowout penstemon habitat in Wyoming included cheatgrass (*Bromus tectorum*) and Russian knapweed (*Centaurea repens*) (Heidel personal communication). Noxious weeds pose threats as competitors and as pesticides are used to control them.

Construction Activities. Impacts from construction activities within blowout penstemon populations could occur but are unlikely. These plants occupy unstable shifting substrates in rugged terrain. These types of sites are not adequate and are generally avoided with respect to road, powerline, house, or building construction activities. Ranchers avoid driving near or through sand blowouts because of the possibility of becoming stuck. Ranch trails and roads are seldom placed in the high, choppy sand habitat of blowout penstemon (USFWS 1992a). No powerlines or pipelines currently cross populations and no new construction is planned (USFWS 1992a).

Vulnerability Based on Small Population Size. At the time of its listing, the blowout penstemon was known to comprise nine small populations in Nebraska that consisted of a total of approximately 2,100 individuals. The small populations known at the time were thought to make the species vulnerable to localized environmental changes. In addition, the species occupies a successional niche in the development and eventual revegetation of blowout habitats. As the vegetation in these areas increases, blowout penstemon undergoes local extirpation. The species was not only rare, but did not appear vigorous at the known localities in Nebraska, possibly because these blowouts had reached a stage of revegetation that exceeded the optimum habitat conditions for the species. Furthermore, the number of new blowouts was decreasing (USFWS 1987). In Wyoming, the species is presently known from two small populations and one large population. The isolation of these populations from each other, as well as the isolation of these populations from other blowout penstemon populations in Nebraska, makes the Wyoming populations similarly vulnerable to the threat of stochastic events (such as prolonged drought, introduction of invasive species) which could lead to reduction or loss of these populations.

Damaging insects and periods of drought may be the greatest natural threats to the survival of this species (USFWS 1992a). Prior to the drought of the 1930's, the blowout penstemon was listed as one of the most common species in sand blowouts. Following the drought of the 1930's which severely influenced the vegetation of the Great Plains, the blowout penstemon was thought extinct until it was rediscovered in Nebraska in 1959. At one time, it was thought that a localized drought of a few years duration could eliminate most of the remaining blowout penstemon plants in Nebraska (USFWS 1992a).

Destructive insects may be a primary cause of decline in populations (USFWS 1992a). Several insects (and arachnids) have been observed feeding on blowout penstemon plants, including spider mites, grasshoppers, and an insect larvae which burrows into the inflorescence. Populations of invertebrates are generally at low levels. However, large numbers of penstemon aphids (*Aphis pentstemonicola*) were observed on two individual transplanted blowout penstemon plants growing in a blowout near Alliance, Nebraska. Foliage of the infested plants appeared wilted, grayish-green, and stunted. Several seed predators have also been found active on blowout penstemon. The most serious insect threat appears to be the pyralid moth. Larvae of

a pyralid moth did extensive damage to one population of blowout penstemon in 1990. Adult female pyralid moths deposit their eggs on blowout penstemon plants. After hatching, the larvae burrow into the stems and are active until reaching the pupal stage. These larvae damage or kill blowout penstemon plants by boring into the crown area below the plant's buds. Blowout penstemon plants are also quite susceptible to fungal root rots. Plants infected with these fungi wilt, rot, and usually die (USFWS 1992a).

Encroachment by Other Plants. The blowout penstemon is well adapted to the rigorous environment of an actively eroding blowout, but it does not grow in close association with most other plants. It generally grows as widely spaced plants in nearly bare sand indicating that these plants may not have the ability to compete with each other or plants of other species for moisture. Its associate in Nebraska, blowout grass, does not use large amounts of soil moisture. Blowout penstemon populations in Nebraska have been known to rapidly decline as members of new species, primarily sand bluestem (*Adropogon hallii*) and prairie sandreed (*Calamovilfa longifolia*) increase and begin to use significant amounts of soil moisture following stabilization of the sand habitat (USFWS 1992a).

ENVIRONMENTAL BASELINE

Regulations implementing the Act (50 CFR 402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed State or Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation process.

The action area is defined at 50 CFR 402 to mean "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action". For the purposes of this consultation, the Service defines the action area to include (1) approximately 3.5 million acres of Bureau-administered public land surface in the Rawlins Resource Area in Wyoming, and additionally (2) approximately 3.4 million acres of split-estate land (federal subsurface/non-federal surface). This action area includes all lands within the Rawlins Resource Area in Wyoming that could potentially be impacted by decisions made in the Rawlins RMP (BLM 2006).

Historic activities within or adjacent to the action area include residential, urban, commercial, industrial, and agricultural development; road construction; development for recreational use; mining; oil and gas development and its associated infrastructure; airport construction; ski area development; levee construction and maintenance; and dam construction.

Bald Eagle Environmental Baseline

Three formal section 7 consultations with adverse effects to bald eagles have been completed for activities within the action area. These include a consultation for KENETECH/Pacificorp Windpower project completed October 1995 (6-WY-95-F-006), a Statewide Bureau RMP Programmatic Consultation completed June 2004 (ES-6-WY-04-F002, WY7682, USFWS 2004a), and a Federal Highway Administration/Wyoming Department of Transportation (FHWA/WYDOT) Programmatic Consultation (ES-6-WY-05-F012, WY9299) completed November 2005.

The KENETECH/Pacificorp consultation analyzed the potential effects of a windpower plant (including turbines and operations, maintenance, communications, and transmission facilities) to the bald eagle in the Foote Creek Rim-Simpson Ridge area in Carbon County, Wyoming. Incidental take associated with that windpower plant was expected to be lethal with one bald eagle expected to be taken by electrocution, or collision with power lines or wind turbine rotor blades. Monitoring efforts have revealed the taking of numerous birds and bats, but no bald eagle deaths have yet to be observed.

The Bureau's RMP Programmatic consultation analyzed the impacts of all activities potentially implemented under the Bureau's RMPs across all Wyoming counties. That consultation did not identify a specific amount of incidental take. Instead it clarified that incidental take would be identified during individual project-level section 7 consultations prior to implementation of individual projects implemented under the individual Bureau RMPs.

The FHWA/WYDOT Programmatic Consultation identified potential incidental take of bald eagles due to safety project south of Saratoga, Wyoming. The potential effects from that project are specifically related to potential disturbance type effects or indirect effects because of highway construction activities. The project may occur within 0.5 miles of a nest or roost.

Status of the Bald Eagle Within the Action Area

Nesting. Forty bald eagle nest sites (active and inactive) are currently known to occur within the Rawlins Resource Area (BLM 2003). The status/current use of several of the nests within the Rawlins Resource Area is not known. Twenty-nine nests are located on privately owned lands, six are on lands administered by the Bureau (BLM 2006), 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. Two communal winter roosts are known within the Rawlins Resource Area (BLM 2003). One roost occurs in riparian habitat associated with the Little Snake River and one roost occurs in the Pedro Mountains in the northern portion of the resource area.

Concentrated Foraging. 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 Rawlins Resource Area (BLM 2003). General foraging habitats associated with rivers, streams, lakes, reservoirs, and open, upland habitats occur in the Resource Area and are suitable foraging areas for bald eagles.

Factors Affecting the Bald Eagle Environment Within the Action Area

The decline of nesting bald eagle populations in the lower 48 states during the last century has been attributed to several factors including habitat loss or alteration, environmental contamination, poisoning, shooting, collisions, and electrocutions. However, with the banning of DDT and the signing and enforcing of numerous protection laws, the bald eagle population is currently recovering.

Habitat loss. Habitat loss includes the physical disturbance of habitats associated with development and with human activities that can deter eagles from otherwise suitable habitats.

Bald eagles are particularly sensitive to human activities near active nests and winter roosting areas. Unfamiliar or new activities near active nests can be detrimental during egg incubation and brooding periods. Disturbance can flush adults from nests and expose eggs or young to adverse weather conditions or deprivation of food, and thus decrease hatch rates and young survivability (USFWS 1999c). Human activities near active winter roosting areas may cause eagles to abandon these habitats and expend energy finding other suitable roost areas (BLM 2003). Additional energy use and added stresses can lead to general deterioration in health condition and possibly affect survivability and reproductive success. Human activities near active nests may disrupt nesting activities or may cause nest abandonment which can comprise the reproductive potential for that breeding season (Grubb *et al.* 1992).

Habitat loss due to development of riparian areas for agricultural, urban, and recreational uses is another major concern for the bald eagle. Human disturbances in and around eagle habitat can also result in nest failure or abandonment of nesting, foraging, or roosting areas. Loss of habitat also occurs due to a lack of regeneration of the cottonwood trees – a preferred roost and nest tree species. Lack of cottonwood regeneration results from livestock grazing and to a lesser extent the altering of streams and rivers for the construction of reservoirs and dams due to the lack of overbank flooding necessary for growth of new cottonwood stands.

Disturbance. As previously stated, bald eagles prefer areas with little human disturbance for nesting and other activities [Greater Yellowstone Bald Eagle Working Group (GYBEWG) 1996, Montana Bald Eagle Working Group 1994, Anthony *et al.* 1982, Stalmaster and Newman 1978]. Responses of bald eagles to human disturbance vary depending on the eagle individual/pair, and the type, intensity, duration, time of year, predictability, and the location of human activity (GYBEWG 1996). In one study, the distance of eagles from a water body increased as the recreational use of the water body increased (Swenson *et al.* 1986). All the bald eagle nests on Yellowstone Lake, Wyoming, were on the roadless south shore (Murphy 1965). The north shore is paralleled by a heavily traveled highway that permits access for a wide range of human recreational activities.

Documented causes of nest failure or abandonment include climbing to an active nest, or nearby snowmobiling, aircraft activity, logging, deer poaching, land clearing, or construction (Cunningham 1960, Weekes 1974, Dunstan and Harper 1975). Bald eagle nesting patterns also changed in response to increased human developments on the San Juan Islands in Washington (Newman *et al.* 1977). As shoreline development or human activity increase, nests are distributed further inland (Whitfield *et al.* 1974).

Contaminants. Before the use of organochlorine-based pesticides including dichloro-diphenyl-trichloroethane (DDT) was banned in the U.S. in 1972, bald eagle populations declined significantly. The use of dichloro-diphenyl-trichloroethane (DDT) and other organochlorine compounds became widespread after World War II. DDT was used as an insecticide to control mosquitoes in riparian and coastal areas. It was determined that dichlorophenyl-dichloroethylene (DDE), a breakdown product of DDT, accumulated in the fatty tissues of adult females birds, including bald eagles, impairing the release of calcium in formation of egg shells. In 1972, DDT use was banned from use in the United States after bald eagle populations plummeted due to reproductive failure caused by thin egg shells. Today, contaminants may still affect the survival and reproductive success of the bald eagle as the use of regulated pesticides and poisons still accounts for bald eagle deaths in many of the western states, where these chemicals are used to control rodent pests and coyotes (USFWS 1999c). Intentional poisoning of coyotes with

carcasses baited with poison may also attract bald eagles. Residues from DDT and other compounds from both historical and present uses can still contaminate prey species and be accumulated in bald eagle tissues. In addition, lead and mercury contribute to bald eagle poisoning and mortality as well.

Long-term exposure to environmental contaminants is also a concern in the recovery of this species. Lead can poison bald eagles when they ingest prey that contains lead shot or fragments, or where the prey has assimilated lead into its own tissues. Mercury exposure is also a concern in some parts of the country. Exposure to high levels of mercury can result in neurological problems that affect flight and other motor skills and can alter and reduce hatching success in bald eagle eggs (USFWS 1999c).

Electrocutions and collisions. Electrocutions and collisions due to power lines are another cause of eagle mortality. Collisions with vehicles pose a threat to eagles foraging on roadkills. Current research is helping to establish guidelines to create safer utility lines utilizing anti-perch devices. Approximately ten years ago, the Wyoming Department of Transportation initiated a program to remove big game carcasses from the State's highways in an effort to reduce the number of vehicle collisions with bald eagles that feed on carrion.

As early as 1922, researchers noted the electrocution of raptors. However, not until the 1970's did researchers become aware of the magnitude of the problem. Franson *et al.* [as cited in Avian Power Line Interaction Committee (APLIC) 2006] summarized that 12 percent of the known bald eagle mortalities were the result of electrocution. Electrocution deaths of bald eagles have been documented across the country including in Wyoming (APLIC 2006). Between 1986 and 1996, electric utility company records from across the western United States and Canada showed that 118 bald eagles and an additional 358 unidentified eagles were electrocuted (Harness 2002). In predominantly treeless areas, which characterizes much of Wyoming, power poles may be the only perches available to bald eagles.

Although not within the action area, bald eagle mortality from electrocution by small distribution power poles and collision with small distribution power lines common to all oil and gas development and to a lesser extent to residential and commercial development was documented in 2000 and 2001 in Montana's Powder River and Billings Resource Management Plan project area (Schomburg 2001, USFWS 2002). Data were collected from 303 carcasses from 1996-2001, and from 273 carcasses in 2000 and 2001, respectively. Causes of death of 23 raptor carcasses were attributed to mid-span collisions, with 21 identified golden eagles (*Aquila chrysaetos*) and 1 bald eagle (Schomburg 2001). Causes of death of 280 raptors were attributed to electrocution, with 219 identified as golden eagles, 4 as bald eagles, and 11 as either golden or bald eagles (Schomburg 2002).

Shooting. Illegal shooting still poses threats to individual bald eagles. Increased law enforcement and public awareness have reduced shooting deaths to a small fraction of the number of shooting mortalities that occurred in the early 1900s (USFWS 1999c).

Preble's Meadow Jumping Mouse (Preble's) Environmental Baseline

For the purposes of this consultation, the Service defines the action area for Preble's to include all suitable habitat for Preble's in the Rawlins Resource Area where the Bureau has discretionary authority over management activities and areas immediately adjacent, upstream, or downstream

from these areas. In addition, the action area will include private, State, or Municipal properties where activities there would not occur "but for" the authorization of the Bureau's permitted activities. Preble's habitat includes riparian systems, the intervening slopes between riparian and upland communities, and upland grasslands (Shenk and Sivert 1999a, Schorr 2001). The width of Preble's habitat for management purposes has been defined as the 100-year floodplain plus 100 meters (328 feet) on both sides of the stream (USFWS 2003b).

Many section 7 consultations for Federal actions affecting the Preble's and its habitat have preceded this consultation, including, but not limited to: (1) activities on Federal lands including those of the Department of Defense, Forest Service, Department of Energy, and Bureau of Land Management; (2) activities affecting waters of the United States by the Army Corps of Engineers under section 404 of the Clean Water Act; (3) licensing or re-licensing of dams by the Federal Energy Regulatory Commission; (4) development, operation, and maintenance of dams, canals, and other means of directing flows by the Army Corps of Engineers and the Bureau of Reclamation; (5) funding and regulation of highway and bridge construction, and improvements by the Federal Highway Administration; (6) licensing or construction of communication sites by the Federal Communications Commission; (7) hazard mitigation and post-disaster repairs funded by the Federal Emergency Management Agency; and (8) issuance of Endangered Species Act section 10(a)(1)(B) permits by the Fish and Wildlife Service.

Prescribed fire has been used by government agencies for the past several decades. Historical burning has been implemented to meet a variety of resource objectives, including fuels reduction, wildlife habitat improvement, rangeland improvement, etc. Most burning has taken place in grassland/shrubland communities, with a limited amount of understory burning in ponderosa pine vegetation types. A formal programmatic consultation over the potential effects of prescribed fire to the designated critical habitat of Preble's on the Medicine Bow National Forest was completed in December 2003 (see USFWS 2003a, ES-6-WY-04-F003, WY7696). To date, there have been no implemented actions or reported on-the-ground effects as a result of actions implemented under that section 7 formal programmatic consultation.

Status of Preble's within the Action Area

Little is known regarding the size of most Preble's populations. The population size of any Preble's population is probably the result of many factors (current and historical), some of which are not apparent. Current factors influencing Preble's population size include stream reach length, width of riparian vegetation, habitat condition, and landscape context (Pague and Grunau 2000). White and Shenk (2000) found the majority of variation in Preble's density was explained by variation in shrub and tree cover.

Accurate estimation of population size requires extensive study, usually involving some type of mark/recapture technique employed over several years. This approach has been attempted at a limited number of sites with varying densities detected between sites and between years at some sites. Throughout the range of Preble's, riparian vegetation is quite variable (quantity and quality of vegetation available to Preble's) making it difficult to extrapolate density estimates to sites other than those at which they were calculated. A rough estimate of 38 mice per stream mile is cautiously being used for recovery planning purposes by the Preble's Recovery Team.

Because the action affects Preble's within its range in Wyoming, the status of the species within the action area and the factors affecting the species environment within the action area

(environmental baseline) is a subset of information presented in the status of the species section of this BO.

Surveys from several Wyoming counties, including Laramie and Albany counties have documented Preble's. In Albany County, Preble's has been found in drainages of the Laramie Range in the eastern half of the county. In Laramie County, Preble's has been found in nearly every drainage in the western half of the county where suitable habitat exists. From the period of 1996 to 2005, 49 surveys were conducted in both Laramie and Albany Counties of the Rawlins Resource Area and resulted in captures of 185 *Zapus* specimens, assumed to be Preble's. These surveys were conducted in habitat found in the Lodgepole Creek, Middle Lodgepole Creek, South Lodgepole Creek, South Branch of Crow Creek, Middle Crow Creek, Crow Creek, Cottonwood Creek, Laramie River, Little Bear Creek, Lone Tree Creek, Horse Creek, South Bear Creek, North Bear Creek, Chugwater Creek, Spring Creek, and Three Mile Creek drainages.

The Bureau in Rawlins administers activities on hundreds of scattered isolated parcels in Laramie and Albany Counties within the range of Preble's. Although these parcels are typically positioned in the upland areas, there are some parcels which do have riparian habitat which could be occupied by Preble's.

Factors Affecting Preble's within the Action Area

Several factors may have played a role in reducing the range and abundance of Preble's. The following items have been identified as potential threats to their populations and recovery. Much of the following discussion comes from the Preble's Science Team's Threat Assessment (Pague and Grunau 2000) and the rule listing this mouse under the Act (63 FR 26517).

Development and Habitat Alteration. Urban and suburban development, in and adjacent to riparian areas, are the primary factors affecting Preble's throughout most of its range (Pague and Grunau 2000); however, within the action area, this type of development is quite limited and therefore has little effect on Preble's habitat from this activity. If additional development does affect the action area, as is occurring in other portions of Preble's habitat in Wyoming, it could result in the elimination of habitat or reduce the quality of habitat by increasing disturbance, reducing water quality, channelizing streams, and increasing densities of exotic predators such as Norway rats, domestic dogs, and domestic cats, as well as human-commensal predators (e.g., skunk, raccoon, red fox)(Pague and Grunau 2000). Changes in habitats and their component plant communities affect the composition of the mammalian community found within them (Andersen *et al.* 1980).

Preble's is closely associated with riparian ecosystems that are relatively narrow and represent a small percentage of the landscape. If habitat for Preble's is destroyed or modified, populations in those areas can decline or be extirpated. The decline in the extent and quality of Preble's habitat is considered the main factor threatening Preble's (Hafner *et al.* 1998, Shenk 1998). As stated in the rule listing Preble's under the Act (63 FR 26517), habitat alteration, degradation, loss, and fragmentation resulting from urban development, flood control, water development, agriculture and other human land uses have adversely impacted Preble's populations.

Conversion of habitats from native riparian ecosystems to commercial croplands and grazed rangelands was identified as the major threat to their persistence in Wyoming (Clark and

Stromberg 1987). Habitat fragmentation also limits the extent and abundance of Preble's populations. As populations become fragmented and isolated, it may become more difficult for them to persist (Caughley and Gunn 1996).

Residential, recreational, and commercial development, accompanied by highway and bridge construction, directly removes, reduces, alters, fragments, and/or isolates Preble's habitat to the point where populations no longer can persist. These factors may impact the species by destroying mouse nests, food resources, and hibernation sites, by disrupting behavior, or by acting as barriers to movement.

Changes to Hydrology. Hydrological changes (including changes in water quantity, flow regime, groundwater level, and stream alterations such as channelization) continue to occur throughout the range of Preble's. While the existing development in the action area is limited, it is expected to increase and may result in an increase in water wells, culverts and/or bridges over riparian areas leading to erosion and degradation of habitat as well as the habitat altering effects discussed above. Establishment and maintenance of riparian plant communities are determined by the interactions between surface water dynamics, groundwater, and river channel processes (Busch and Scott 1995). Changes in hydrology can alter the channel structure, riparian vegetation, and valley floor landforms (Gregory *et al.* 1991). Thus, changes in the timing and abundance of water may be detrimental to the persistence of Preble's in these riparian habitats due to resultant changes in vegetation. Such changes in hydrology may occur in many ways, but two of the more prevalent are the disruption of natural flow regimes below dams, and "boom and bust" runoff cycles in watersheds with increased areas of paved or hardened surfaces that preclude water percolation.

Similarly, depletion of groundwater via wells and water diversions also affects the vegetation within Preble's habitat. As groundwater supplies are depleted, more xeric plant communities replace the riparian vegetation. The conversion of these habitats from mesic, shrub-dominated systems to drier grass-dominated systems would preclude Preble's from these areas.

Alluvial aggregate extraction may produce long-term changes to Preble's habitat by altering hydrology and removing riparian vegetation. In particular, such extraction usually removes or precludes the development of riparian shrub and herbaceous vegetation. Furthermore, mining impacts the deposits of alluvial sands and gravels that may be important hibernation locations for Preble's (D. Armstrong, University of Colorado, unpublished data).

Channelization increases the rate of stream flow, straightens riparian channels, and narrows riparian areas (Pague and Grunau 2000). Creating impervious cement channels destroys riparian vegetation and precludes its reestablishment. Using riprap and other structural stabilization options to reduce erosion can destroy riparian vegetation and prevent or prolong its establishment. These impacts can alter the plant composition, soil structure, and physiography of riparian systems to the point that Preble's can no longer exist there.

Haying and ditch maintenance. Intensive hay production and ditch maintenance operations may negatively impact Preble's by removing traditional food and shelter resources. While it is believed that most haying operations that allow riparian vegetation to remain in place may be compatible with persistence of Preble's populations, further study is needed. Ditch maintenance activities may conversely create additional riparian habitats for Preble's and hay production with

the associated increase in irrigated acreage and high protein hay (e.g. alfalfa) may provide alternate food sources for Preble's. Further study is necessary to better understand potential impacts of these activities to Preble's.

Roads. Transportation corridors frequently cross Preble's habitat and may negatively affect adjacent populations. As new roads are built and old roads are maintained, the habitat is destroyed and possibly fragmented. Roads also may act as barriers to dispersal. Train and truck accidents within riparian areas may release spills of chemicals, fuels and other substances that may impact the mouse or its habitat. Recent section 7 consultations on road realignment and bridge replacement in the action area include the Morton Pass to Sybille Canyon Road Realignment (WY3222), the Sybille Canyon Road Realignment (ES-6-WY-02-F010, WY5820), and the Horse Creek Road Bridge Replacement (ES-6-WY-04-F011, WY8141). These road projects impacted 0.34 acres, 4.72 acres, and 0.4 acres of Preble's habitat, respectively. Also, a FHWA/WYDOT Programmatic Consultation (ES-6-WY-05-F012, WY9299) was recently completed in November 2005. The FHWA/WYDOT Programmatic Consultation identified potential incidental take of 67 Preble's home ranges across the species range in Wyoming as a result of road construction and maintenance activities.

Invasive plant species. Invasive, noxious plants can encroach upon a landscape, displace native plant species and form monocultures of vegetation. This change reduces the abundance and diversity of native plants, and may negatively impact cover and food sources. The control of noxious weeds may entail large-scale removal of vegetation and mechanical mowing operations, which also may impact Preble's.

The tolerance of Preble's for invasive plant species is not well understood. Whether or not invasive plant species reduce Preble's persistence at a site may be due in large part to whether they create a monoculture and replace native species. There is concern about nonnative species such as Russian olive (*Elaeagnus angustifolia*) and leafy spurge (*Euphorbia esula*). Leafy spurge may be of particular concern, since it may form a monoculture, displacing native vegetation and thus reducing available habitat (Selleck *et al.* 1962). Within Larimer and Weld Counties of Colorado, Russian olive occurred in six (33 percent) of the areas where no jumping mice were found, while it was absent in areas where jumping mice were captured (Shenk and Eussen 1998). However, Russian olive was present in Wyoming sites where jumping mice were captured.). Invasive species on the F.E. Warren Air Force Base within the range of Preble's in Laramie County include leafy spurge, dalmatian toadflax (*Linarea dalmatica*), Canada thistle (*Cirsium arvense*), musk thistle (*Carduus nutans*), and spotted knapweed (*Centaurea biebersteinii*).

Recreational trails. Trail systems frequently parallel or intersect riparian communities within Colorado. The development of trail systems may impact Preble's by modifying its habitat, nesting sites, and food resources in both riparian and upland areas. Humans and pets using these trails may alter behavior patterns of Preble's and cause a decrease in survival and reproductive success. A few isolated Bureau-administered parcels are located adjacent to the Pole Mountain Unit of the Medicine Bow National Forest within the range of Preble's. Although there are currently no developed recreational trails present on these parcels, potential exists for user-created trails to be established there.

Rights-of-Way. Many utility lines (sewer, water, communications, gas, electric, municipal water ditches) cross Preble's habitat. Current and future utilities rights-of-way through these habitats

may represent a threat from habitat fragmentation via new construction, toxic chemical spills, and habitat disturbance during construction and periodic maintenance. However, utility corridors are currently short term disturbances, due to project review and reclamation required since listing in 1998. Specifically, two pipeline projects have recently been completed and have resulted in adverse effects to Preble's habitat since its listing. These are the 1999 Medicine Bow Lateral pipeline (WY2567, USFWS 1999a) and the subsequent 2001 Medicine Bow Lateral Loop project (ES-6-WY-01-F003, WY4352, USFWS 2001a) which resulted in temporary Preble's habitat loss totaling 0.68 acres and 2.12 acres in Laramie County, Wyoming, respectively.

A third pipeline (Entrega Natural Gas Pipeline) project is currently under construction and section 7 consultation on that pipeline has recently been completely (WY9771b, USFWS 2006). That pipeline consisted of a 327-mile, 36 to 42-inch diameter pipeline that will extend from the Meeker Hub in Rio Blanco County, Colorado to interconnections near Wamsutter in Sweetwater County, Wyoming, then east to terminate at the Cheyenne Hub in Weld County, Colorado. This pipeline will include compressor stations, access roads, and temporary use areas. Construction of the Entrega Natural Gas Pipeline included clearing vegetation from a 100-foot wide right-of-way, digging a six to seven foot deep trench to lay the pipe, backfilling the trench, hydrostatic testing of the pipe and then reclamation of the site. The Federal Energy Regulatory Commission is the lead agency on this project. At this time, it is anticipated that the Entrega Natural Gas Pipeline project will temporarily disturb 4.10 acres of suitable Preble's habitat (approximately four Preble's home ranges). All disturbed areas will be revegetated following project completion.

Predation and other interspecific interactions. Predation is a natural occurrence in Preble's populations, and would not normally be considered a threat. However, the increasing presence of humans near Preble's habitats may result in an increased level of predation that may pose a threat to the mouse. Striped skunks (*Mephitis mephitis*), raccoons (*Procyon lotor*), red foxes (*Vulpes vulpes*) and domestic and feral cats are found in greater densities in and around areas of human activity; all four of these species feed opportunistically on small mammals (Churcher and Lawton 1987). Therefore, Preble's populations that are near suburban settings are subjected to greater predation. Introduction of non-native aquatic species, such as bullfrogs, has resulted in additional predation on Preble's. The fact that summer mortality is higher than over-winter mortality underscores the impact that predators can have on Preble's and other small mammals. Preble's is also thirteen times less likely to be found at sites where house mice are present (Clippinger 2002) possibly resulting from interspecific competition or displacement interactions between these species.

Lack of existing laws. The decline of Preble's is partly due to the lack or ineffectiveness of existing laws that could protect the mouse and its habitat. Various existing Federal laws, such as the Clean Water Act, the Act (prior to listing of Preble's), Federal Power Act, Fish and Wildlife Coordination Act, Food Security Act, and National Environmental Policy Act have not been effective in the past to protect occupied riparian habitat. The listing of Preble's under the Act provides a level of protection that increases the likelihood of conserving the subspecies.

Considered threatened under the non-game provisions of the Colorado Division of Wildlife, Preble's can only be taken legally by permitted personnel for educational, scientific, or rehabilitation purposes. The Wyoming Game and Fish Department considers all meadow jumping mice (*Zapus hudsonius* spp.) as "non-game species," and are protected under Wyoming

Non-game Wildlife Regulations. Although these Colorado and Wyoming State regulations prohibit the take of individual mice, they do not protect Preble's habitat.

Chemicals. Pesticides and herbicides are used within the range of Preble's for noxious weed control and other agricultural purposes. These chemicals may poison Preble's directly, or be detrimental to the vegetation in its habitat. Overall, an integrated pest management approach (use of biological, chemical and mechanical control) may help reduce the threat of chemicals, but allow for the control of exotic species.

Fire. Fire is a natural component of the Colorado Front Range and Wyoming foothill systems and *Z. h. preblei* habitat naturally waxes and wanes with fire events. Overall, fire may be one of the methods needed to maintain riparian, transitional, and upland vegetation within Preble's habitat. A formal section 7 consultation was recently completed for an FE Warren AFB Burning Project (ES-6-WY-01-F010, WY4648, USFWS 2001b). In that consultation, it was estimated that 0.01 acres of temporary disturbance could occur within the range of Preble's.

Over the past several decades, as human presence has increased in and near Preble's habitat, significant effort has been made to suppress fires. Long periods of fire suppression may result in a build-up of fuel and result in a catastrophic fire. As with many natural catastrophes, fire can kill mice and alter habitat. Although there are no records of fire killing *Z. h. preblei*, it is possible that fire may take a limited number of individuals. Catastrophic fire in particular can alter habitat dramatically, changing the structure and composition of the vegetation communities such that Preble's may no longer persist. Precipitation falling in a burned area may degrade Preble's habitat by causing greater levels of erosion and sedimentation along creeks.

Water quality. The quality of the water in riparian habitats may affect the survival and abundance of Preble's. Point sources of pollution such as fuel and chemical waste spills or sanitary/sewer drains can degrade the water quality of an area. Non-point sources of pollution such as urban or agricultural runoff can affect riparian systems as well. Recently, two streams in the range of Preble's on Medicine Bow National Forest in Laramie County, Wyoming (Middle Crow Creek and the North Branch of the North Fork of Crow Creek) exceeded the fecal coliform standard -- a measure of bacteria from animal feces. A number of groups are working to remedy this problem.

Catastrophic events. Flooding and fire events may temporarily impact Preble's by removing some riparian habitat. However, normal flooding and fire events help maintain the willow communities that provide suitable habitat for Preble's. Increasing the paved surfaces within a water drainage can result in increased flood events and prevent the re-establishment of riparian communities.

Population changes. Stochastic, or random, changes in a wild population's demography, genetics, and environment can threaten its persistence (Brussard and Gilpin 1989, Caughley and Gunn 1996). A stochastic demographic change such as a skewed age or sex ratio (for example, a sudden loss of adult females) could negatively affect reproduction, especially in a small population. Disruption in gene flow due to reduction and isolation of populations may create unpredictable genetic effects that could impact Preble's persistence in an area. While stochastic events are not known to be a threat to Preble's populations at this time, the likelihood of such events may increase as populations become smaller and more isolated in the future. Flooding is an example of a stochastic event that commonly occurs in Preble's habitat. An extreme flooding

situation could eliminate an entire Preble's population in an affected stream reach or drainage. Habitat may be re-colonized after such events if there are occupied, connected tributaries or mainstem stretches that were not flooded.

Forage Production. Overgrazing of riparian areas reduces habitat quality for Preble's (Clark and Stromberg 1987, Compton and Hugie 1993). In the action area, grazing problems may be associated with Apet@ livestock containment on small acreages; however, little development is currently occurring in the action area. In the action area, grazing occurs sporadically across the landscape, some overgrazing may be occurring in limited areas where cattle congregate in riparian areas during winter and spring or in very small areas where livestock gain access to water year-round.

Unprotected Habitat. Most Preble's meadow jumping mouse habitat within the action area occurs on lands that are privately owned or are administered by the State of Wyoming or Colorado, or the Cities of Cheyenne or Fort Collins.

Preble's Critical Habitat Environmental Baseline

For the purposes of this consultation, the Service defines the action area to include all designated critical habitat for Preble's in the Rawlins Resource Area where the Bureau has discretionary authority over management activities. In addition, the action area will include those designated critical habitat areas, their primary constituent elements, and any influence on them on private, State, or municipally-owned, or U.S. Forest Service-administered properties where activities there are interrelated and interdependent and would not occur "but for" the Bureau's permitted activities. For critical habitat designation, the Service delineated critical habitat as 110 meters (360 feet) outward from the stream edge of 1st and 2nd order streams. For 3rd and 4th order streams, the Service delineated critical habitat as 120 meters outward from the stream edge. For 5th order streams and above, the Service delineated critical habitat as 140 meters outward from the stream edge.

Prescribed fire has been used by government agencies for the past several decades. Historical burning has been implemented to meet a variety of resource objectives, including fuels reduction, wildlife habitat improvement, rangeland improvement, etc. Most burning has taken place in grassland/shrubland communities, with a limited amount of understory burning in ponderosa pine vegetation types. A programmatic consultation over the potential effects of prescribed fire to the designated critical habitat of Preble's was recently completed (see USFWS 2003a). To date, there have been no implemented actions or reported on-the-ground effects as a result of actions implemented under that programmatic consultation.

Status of the Preble's Critical Habitat within the Action Area

Three critical habitat units [North Platte 1 (NP1), North Platte 3 (NP3), and South Platte 1 (SP1)] are partially contained within the Rawlins Resource Area and are potentially affected by the proposed action.

<u>Unit NP1: Cottonwood Creek</u>
Unit NP1 encompasses approximately 2,284 acres on 26.9 miles of streams within the Cottonwood Creek watershed. It includes Cottonwood Creek from Harris Park Road upstream to 7,000 feet in elevation. Tributaries include North Cottonwood Creek and Preacher Creek. The

unit includes both public and private lands, including a small portion on the Medicine Bow-Routt National Forest.

This unit is located in the Glendo Hydrologic Unit (HUC) and is designated to address the large recovery population for the North Platte River drainage. Preble's habitat on this unit appears generally excellent, particularly on the National Forest System lands. This population is essential not only to maintain distribution near the northernmost extreme of known Preble's range, but because the large size of the population (as predicted by amount and quality of habitat) should help ensure viability into the future. Private lands within the unit are used extensively for grazing, which could be beneficial to Preble's and its habitat if managed appropriately.

A specimen examined by Krutzsch (1954) in describing the subspecies is from Springhill in this HUC. Five recent specimens from this subdrainage have been identified as Preble's through morphological examination (tooth fold presence) (Jones, in litt., 2002). Captures of jumping mice identified in the field as Preble's have occurred at several other locations in this subdrainage.

Unit NP3: Chugwater Creek

Unit NP3 encompasses approximately 7,194 acres along 85.3 miles of streams within the Chugwater Creek watershed. The unit extends from several miles downstream of the town of Chugwater, upstream on Chugwater Creek and its tributaries to approximately 7,000 ft in elevation. Major tributaries within the unit include Middle Chugwater Creek, South Chugwater Creek, Ricker Creek, Strong Creek, and Shanton Creek. The unit consists of both public and private lands.

This unit is located in the Lower Laramie HUC and is designated to address the large recovery population in the North Platte River drainage. The unit supports excellent Preble's habitat with a complex tributary system and is likely to support a high density of Preble's. While some isolated portions of this unit may be less suitable, those areas are most likely not permanently affected by current land use practices or pose such barriers as to segregate portions of the Preble's population in this unit. Based on the amount and apparent quality of Preble's habitat contained in this unit, it may support one of the largest populations of Preble's within its entire range and has a high probability of remaining viable well into the future. Threats to the unit are future development, road construction, and road improvements. In addition, the unit is repeatedly crossed by gas pipelines and utility corridors. Haying and grazing may be threats to Preble's in portions of the unit.

Specimens of Preble's from this HUC include a specimen from Chugwater examined by Krutzsch (1954) in describing the subspecies, and specimens from Sybille Creek, Chugwater Creek, and Hunton Creek verified as Preble's through morphological examination (tooth fold presence). Captures of jumping mice presumed to be Preble's have occurred at several other locations in this subdrainage.

Unit SP1: Lodgepole Creek and Upper Middle Lodgepole Creek

Unit SP1 encompasses approximately 654 acres on 13 miles of streams within two subunits in the Lodgepole Creek watershed: Lodgepole Creek and the Upper Middle Lodgepole Creek. The Lodgepole Creek subunit includes Lodgepole Creek from Horse Creek Road (County Road 211) upstream beyond the confluence of North Lodgepole Creek and Middle Lodgepole Creek up to

7,000 feet elevation on both creeks. The subunit consists of almost entirely private lands. The Upper Middle Lodgepole Creek subunit includes Middle Lodgepole Creek from the eastern boundary of the Pole Mountain Unit of the Medicine Bow-Routt National Forest upstream to about 7,750 feet in elevation and including the North Branch of Middle Lodgepole Creek. The unit consists of public lands including portions of the Medicine Bow-Routt National Forest. This unit is located in the Upper Lodgepole HUC and is designated to address two of three small recovery populations called for in this HUC in our conservation strategy. The Lodgepole Creek subunit will likely be threatened in the future by development including road construction. The Upper Middle Lodgepole Creek subunit may be threatened by grazing pressure (particularly during drought conditions) and off-road vehicle use. Critical habitat on this unit is designated based on captures of jumping mice on Middle Lodgepole Creek and the North Branch of Middle Lodgepole Creek. Although these two trap sites are fairly high in elevation, a specimen was confirmed as Preble's on the North Branch of Middle Lodgepole Creek through genetic examination and a second specimen was verified to be Preble's through morphological examination (tooth fold presence).

Factors Affecting the Preble's Critical Habitat within the Action Area

Federal actions that, when carried out, funded or authorized by a Federal agency, may destroy or adversely modify critical habitat for Preble's include, but are not limited to: (1) any activity that results in development or alteration of the landscape within a unit, including land clearing; activities associated with construction for urban and industrial development, roads, bridges, pipelines, or bank stabilization; agricultural activities such as plowing, disking, haying, or intensive grazing; off-road vehicle activity; and mining or drilling of wells; (2) any activity that results in changes in the hydrology of the unit, including construction, operation, and maintenance of levees, dams, berms, and channels; activities associated with flow control (e.g., releases, diversions, and related operations); irrigation; sediment, sand, or gravel removal; and other activities resulting in the draining or inundation of a unit; (3) any sale, exchange, or lease of Federal land that is likely to result in the habitat in a unit being destroyed or appreciably degraded; (4) any activity that detrimentally alters natural processes in a unit including the changes to inputs of water, sediment and nutrients, or that significantly and detrimentally alters water quantity in the unit; and (5) any activity that could lead to the introduction, expansion, or increased density of exotic plant or animal species that are detrimental to the Preble's and to its habitat. Federal actions not affecting listed species or critical habitat and actions on non-Federal lands that are not federally funded or permitted do not require section 7 consultation.

Colorado Butterfly Plant Environmental Baseline

For the purposes of this consultation, the Service defines the action area to include all floodplain areas in the Rawlins and Casper Resource Areas, where the habitat conditions are suitable and support Colorado butterfly plant populations, and that could potentially be impacted by decisions made in the Rawlins RMP. These areas are located in Laramie County, Wyoming (the easternmost portion of the Rawlins Resource Area). The land holdings of the Bureau in these areas are mostly scattered, isolated parcels surrounded by private lands. Many of the parcels do not have legal public access and must be accessed by crossing the surrounding private property. Often these Bureau-administered parcels are not fenced from the surrounding private property and livestock are permitted to travel freely across the property boundaries (F. Blomquist and J. Carroll, Personal Communication).

The primary past and present impacts to Colorado butterfly plant in the action area may have included indiscriminate spraying of broadleaf herbicides and the disturbance of riparian areas that contain native grasses due to agricultural conversions, water diversions, channelization, and urban development (USFWS 2000) or vegetative succession in the absence of periodic disturbances which makes habitat unsuitable for seedling establishment (Fertig 2001a). Modification of Colorado butterfly plant habitat suitability may be due to irrigation developments and other human-caused changes to stream hydrology. Human-caused changes to stream hydrology have taken the form of channelization of streams, construction and use of irrigation canals, water impoundment (pond) construction, increased water discharges to surface waters, and water removal from surface flows. These activities are widespread across the Rawlins Resource Area and many historical projects exist there that have changed stream hydrology.

Invasive plant species do occupy much of the Rawlins Resource Area and herbicide use to control these invasive species has been undertaken by private citizens or performed by County Weed and Pest Districts.

Livestock grazing and hay production is the predominant land use in Colorado butterfly plant habitat within its distributional range. Grazing, haying and mowing activities are normally undertaken by private land owners as part of their agricultural operations. These activities may be beneficial to Colorado butterfly plants through the maintenance of habitat or they may be detrimental in that these activities if not timed properly may reduce the reproductive success of individual Colorado butterfly plants.

Numerous other existing actions including electricity transmission lines, mining operations, and telecommunication towers are present in the action area. These have been considered as part of the environmental baseline for this action.

The U.S. Department of Defense has developed an Integrated Natural Resources Management Plan (INRMP) prepared under section 101 of the Sikes Act (16 U.S.C. 670a), for protection and conservation of the Colorado butterfly plant on the F.E. Warren Air Force Base near Cheyenne, Wyoming. The INRMP identifies management issues related to conservation and enhancement of the Colorado butterfly plant and identifies goals and objectives that involve the protection of populations and habitat for the Colorado butterfly plant. Some objectives for achieving those goals include: continuing to participate in, and encouraging development of, Cooperative Agreements and Memorandum of Understanding activities with Federal, State, and local government and support agencies; promoting and supporting the scientific study and investigation of federally listed species management, conservation, and recovery; restricting public access in existing and potential habitat areas; and increasing public education of federally listed species through management actions, the WAFB Watchable Wildlife Program, and a Prairie Ecosystem Education Center. The Service will continue to work cooperatively with the Department of Defense, U.S. Air Force to assist the WAFB in implementing and refining the programmatic recommendations contained in this plan that provide benefits to the Colorado butterfly plant.

An additional 11 other properties within the range of the Colorado butterfly plant have Wildlife Extension Agreements (WEAs) in place to provide for the conservation of the Colorado butterfly plant. Nine of the WEAs are with private landowners in Wyoming. Two WEAs are with city

municipalities including the City of Cheyenne, Wyoming and the City of Fort Collins, Colorado (USFWS 2005).

The goals of the above WEAs for the properties are similar in nature and include the following elements:

1. Monitoring Colorado butterfly plant populations and habitat conditions. Data collected during monitoring will include the number of flowering adult plants and habitat condition. Habitat condition in areas managed primarily for livestock grazing will be evaluated according to the Natural Resources Conservation Service (NRCS) rangeland condition assessment methodology. Data will provide information regarding the effects of land management activities on Colorado butterfly plant habitat and population growth;

2. For those areas managed primarily for hay production, coordinating hay cutting activity with needs of Colorado butterfly plant seed production. The landowner agrees to inform the Service prior to the intended first cutting and allow the Service or its designee the opportunity to conduct Colorado butterfly plant surveys. The landowner agrees to allow the Service or its designee at least one additional opportunity to conduct Colorado butterfly plant surveys after the initial cutting, and prior to any additional cuttings. If three or more years of data collection reveals that the conservation needs of the Colorado butterfly plant could substantially benefit from changes in hay production activities, the landowner agrees to work with the Service to modify these activities to the extent feasible;

3. Controlled application herbicides to no closer than 100 feet of a known subpopulation of the Colorado butterfly plant. Some areas included in WEAs that are occupied by the Colorado butterfly plant also are occupied by invasive plant species in need of control, such as Canada thistle and leafy spurge. While herbicide application may be required to control the spread of these invasive species, the landowner agrees to the application of herbicides no closer than 100 feet of a known subpopulation of the Colorado butterfly plant; and

4. Managing livestock grazing activities in conjunction with conservation needs of Colorado butterfly plant. It is assumed that the Colorado butterfly plant requires habitat in average, or above average, range condition according to the criteria identified above. However, if it is found that some other grazing intensity or timing of grazing is beneficial to the Colorado butterfly plant--resulting in above or below average range condition as defined by the NRCS criteria above--then that identified range condition will become the new target for that location to the extent practicable.

Currently approved WEAs are designed to address specific threats to provide for the conservation of the Colorado butterfly plant and to implement conservation actions on the ground. Ninety percent of this Colorado butterfly plants' occurrence is on private land, and, as a federally threatened plant, there are no prohibitions against take under the Act.

One recent formal section 7 consultation with potential adverse effects identified for the Colorado butterfly plant is the consultation for a burning project on the FE Warren Air Force Base which identified 0.01 acres of temporary disturbance (ES-6-WY-01-F010, WY4648).

Another recent formal section 7 consultation is the consultation for the Medicine Bow Lateral Loop (ES-6-WY-01-F003, WY4352) which documented potential temporary disturbance of six Colorado butterfly plant sites.

Status of the Colorado Butterfly Plant Within the Action Area

At least 34 populations of the Colorado butterfly plant are known to occur within the Rawlins Resource Area in Laramie County, based on surveys conducted by the Service in 2004 and 2005. None of the known occurrences are located on Bureau-administered surface land or land where the Bureau has subsurface leasing rights (BLM 2005d). All of these occurrences are located in riparian habitats associated with the North Platte River drainage.

The two largest populations of Colorado butterfly plant within Wyoming occur on the WAFB. The Air Force has entered into cooperative agreements with the Service and The Nature Conservancy to develop management plans and monitor populations on the WAFB (Fertig 2000b). The WAFB has designated habitat along Crow and Diamond Creeks as the Colorado Butterfly Plant Research Natural Area. Current management on the WAFB includes restrictions on application of herbicides and on mowing near stream areas, and introduction of biocontrol insects.

The populations found partly or entirely on state school trust lands and on private lands are managed primarily for production of hay or livestock pasture (Fertig 2000b). None of the private lands are formally protected through conservation easements or comparable designations although wildlife extension agreements (WEAs) for protection of the Colorado butterfly plant have been developed between many of the private landowners and the Service. Currently, 10 such agreements are in place in Laramie County, Wyoming, providing protection to approximately 2,200 acres of riparian habitat along 37 miles of stream.

No Colorado Butterfly Plant populations are known to occur on Bureau-administered lands in any of the Wyoming resource areas including the Rawlins Resource Area. It is possible that undiscovered populations do exist on Bureau-administered lands in the planning area. The majority of Bureau-administered lands in the range of this subspecies are confined to the uplands with very little wetland habitat existing there. The most suitable areas of habitat for the Colorado butterfly plant are found either in private ownership or as state trust lands.

Factors Affecting the Colorado Butterfly Plant Within the Action Area

Factors that could affect this plant in the action area include irrigation developments and other human-caused changes to stream hydrology, introduction of invasive species, herbicide use, urban development (USFWS 2000), vegetative succession in the absence of periodic disturbances which makes habitat unsuitable for seedling establishment (Fertig 2001a), forage production, or stochastic events.

Changes to stream hydrology. Human-caused changes to stream hydrology may take the form of channelization of streams, construction and use of irrigation canals, water impoundment (pond) construction, increased water discharges to surface waters, and water removal from surface flows. These activities are widespread across the Rawlins Resource Area and many historical projects exist that have changed stream hydrology. Invasive plant species do occupy much of the Rawlins Resource Area and herbicide use to control these invasive species may be undertaken by

private citizens or performed by County Weed and Pest Districts. Depending on the time of the year in which it occurs, grazing may be either detrimental or beneficial to Colorado butterfly plant populations. If it occurs during the flowering stage, grazing may reduce the plant's reproductive capacity through removal of the flowers of individual Colorado butterfly plants. However, if timed to occur prior to or subsequent to the plant's flowering stage, grazing may also be beneficial by reducing the density of competing vegetation thereby helping to maintain the plant's habitat.

Construction of stock ponds and reservoirs has inundated some Colorado butterfly plant habitat and made it unsuitable for the subspecies. The development of irrigation canals to move water to croplands may remove moisture from occupied or potentially suitable habitat leaving it in a drier, unsuitable condition. Additionally, the management of water resources for domestic and commercial uses, coupled with encroaching agricultural land use, has had a tendency to channelize and isolate water resources and fragment, realign, and reduce riparian and moist lowland habitat that could otherwise serve as potential Colorado butterfly plant habitat (USFWS 2000).

Introduction of invasive species/herbicide use. One serious threat on agricultural lands is non-selective use of broadleaf herbicides for the control of *Cirsium arvense* (Canada thistle), *Euphorbia esula* (leafy spurge), and other exotic plants (Marriott 1987). The noxious weed problem in Laramie County, Wyoming, is particularly evident on WAFB. Although competition from these subspecies may have serious negative implications for populations of Colorado butterfly plant, the plant appears to be highly susceptible to commonly used herbicides when they are applied non-selectively. Additionally, herbicide use along road crossings in and adjacent to Colorado butterfly plant populations also has been noted. Biological control agents have been used at WAFB, but have not yet been fully effective in controlling Canada thistle or leafy spurge. Introduced gall-forming flies have slowly become established on the WAFB and have reduced the vigor, height, and reproductive ability of small patches of Canada thistle. The first evidence of successful establishment of flea beetles, a biocontrol agent for leafy spurge, was observed on the WAFB in 1997 (Fertig 1998).

Urban development. Residential and urban development around the cities of Cheyenne and Fort Collins has converted areas of formerly suitable Colorado butterfly plant habitat (USFWS 2000).

Vegetative succession in the absence of periodic disturbances. In nonagricultural, undeveloped areas, a significant threat to Colorado butterfly plant populations is habitat degradation resulting from succession of the plant community. Without periodic disturbance events, the semi-open habitats preferred by this subspecies can become choked by tall and dense growth of willows, grasses, and exotic weeds (Fertig 1994). Natural disturbances, such as flooding, fire, and native ungulate grazing, were sufficient in the past to create favorable habitat conditions for the plant. However, the natural flooding regime within the subspecies' floodplain habitat has been altered by construction of flood control structures and by irrigation and channelization practices. In the absence of such natural disturbances today, managed disturbance may be necessary to maintain and create areas of suitable habitat (Fertig 1994, 1996). However, many Federal programs, such as those administered by the USDA Natural Resources Conservation Service, focus on enhancing or protecting riparian areas by removing the types of disturbance the plant needs, increasing vegetative cover, and pushing the habitat into later successional stages.

Forage production. Livestock grazing and hay production is the predominant land use in Colorado butterfly plant habitat within the Rawlins Resource Area. Grazing activities on Bureau-administered lands are authorized by the Bureau through a permitting process. Grazing, haying and mowing activities are normally undertaken by private land owners as part of their agricultural operations. These activities may be beneficial to Colorado butterfly plants through the maintenance of habitat or they may be detrimental in that these activities if not timed properly may reduce the reproductive success of individual Colorado butterfly plants.

On some sites, including WAFB, habitat degradation resulting from plant succession and noxious weed competition is the main threat to the long-term survival of populations (USFWS 2000).

Conversion of moist, native grasslands to commercial croplands has evident through portions of the action area. Since much of the agricultural lands are irrigated hay fields, mowing of Colorado butterfly plant habitat for hay production has been suggested as a potential threat if conducted at an inappropriate time of year. Although this threat can be significant if cutting occurs before the plant's fruits have ripened, if cutting is delayed until late in the growing season when a hard fruit wall is developed, the seeds are not damaged by cutting and may actually be dispersed in the process. Likewise, early season mowing (before the flower stalks have bolted) may provide some advantages to the plant by reducing the cover of competing vegetation (Fertig 1994).

There are no known diseases affecting Colorado butterfly plant populations, although the subspecies is occasionally affected by insect galls. Colorado butterfly plant is highly palatable to a variety of insect and mammalian herbivores [e.g., cattle, horses, and pronghorn (*Antilocapra americana*)]. Livestock grazing can be a threat at some sites if grazing pressures are high due to animals are not being rotated among pastures or concentrated use during the summer flowering period. Additionally, plants are occasionally uprooted or trampled by livestock and wildlife grazing in the vicinity. In at least one location where a population of Colorado butterfly plants was divided by a fence, the heavily-grazed side of the fence had few or no Colorado butterfly plants. However, in a similar situation, the more heavily-grazed side of the fence had numerous rosettes, but the side with no grazing had dense willow cover and no Colorado butterfly plants. In addition to the intensity of grazing, the timing of grazing is key to Colorado butterfly plant survival. Based on surveys conducted by the Service in 2004 and 2005, observations have shown that the plant can persist and thrive in habitats that are winter-grazed or managed on a short-term rotation cycle. Light to medium grazing can provide additional benefits by reducing the competing vegetative cover and allowing Colorado butterfly plant seedlings to become established (USFWS 2000).

Stochastic Events. Because of the small, isolated nature of the populations and the few individuals present in many of them, the Colorado butterfly plant also is more susceptible to random events, such as fires, insect or disease outbreaks, or other events that can easily cause the extirpation of small populations. Although the plant evolved with and even depended upon the disturbance associated with various types of events, they may now pose a threat to the Colorado butterfly plant. Individual plants may not survive such events, and because of low numbers and the now highly restricted range of the subspecies, events such as fires and floods pose a threat.

Colorado Butterfly Plant Critical Habitat Environmental Baseline

For the purposes of this consultation, the Service defines the action area to include critical habitat for the Colorado butterfly plant as defined by the Service on which the Bureau may have some discretionary authority over management actions. For critical habitat designation, the Service delineated critical habitat as 360 feet outward from the stream edge of 1st and 2nd order streams. For 3rd and 4th order streams, the Service delineated critical habitat as 393 feet outward from the stream edge. For 5th order streams and above, the Service delineated critical habitat as 458 feet outward from the stream edge.

Status of the Colorado Butterfly Plant Critical Habitat within the Action Area

Seven units were designated as critical habitat for the Colorado butterfly plant, however, only six of these occur within the action area. There is no critical habitat for the Colorado butterfly plant designated on Bureau-administered lands within the Rawlins Resource Area. There are also no subsurface mineral development activities currently occurring beneath privately owned surface lands within the designated critical habitat of the Colorado butterfly plant within the Rawlins Resource Area. However, Bureau-authorized grazing permits have been identified as potentially affecting designated critical habitat of the Colorado butterfly plant. This is because the Bureau has small, isolated, often unfenced parcels administered under Section 15 of the Taylor Grazing Act in the portion of the resource area which contains the Colorado butterfly plant. The livestock grazing associated with these parcels is authorized by the Bureau and the grazing preference placed on the grazing permit may extend to the management of livestock grazing on the private ranch land surrounding the parcels. Therefore, a federal nexus may be established between the grazing on the surrounding private lands and the grazing on the "Section 15 grazing parcels". The stipulations placed by the Bureau on the "Section 15 parcels" could affect the grazing management occurring on the surrounding private lands, some of which may contain portions of Colorado butterfly plant critical habitat (J. Carroll, F. Blomquist; Personal Communication). Within the grazing allotments which contain isolated Section 15 parcels, the Bureau has limited ability to monitor the grazing which may occur on the surrounding private land as a result of the grazing which they permit on their unfenced parcels.

The following are brief descriptions of the designated critical habitat units within the action area, and reasons why the PCEs essential for the conservation of the Colorado butterfly plant may be in need of special management or protection. To date, the Rawlins Bureau has not identified which of these units may be affected by livestock grazing permit approval on grazing allotments which include Bureau-administered Section 15 grazing parcels.

<u>Bear Creek East Unit</u>
The Bear Creek East Unit consists of 358 acres along 5 miles of the South Fork of the Bear Creek and the Bear Creek in Laramie County, Wyoming. Surveys during 2004 revealed reproductively mature Colorado butterfly plants in the South Fork of the Bear Creek from T19N67W Section 25, extending northeast to Section 17, and within T19N66W Section 11, bordering Section 12. This unit is primarily under private ownership. Habitat within this stream reach is primarily identified as palustrine emergent seasonally flooded (PEMC) wetland intermixed with palustrine emergent temporarily flooded (PEMA) wetland. Surveys during 2004 revealed that Section 36 on the southwestern end of the originally proposed unit, and Sections 16, 9, 10 and the eastern half of Section 12 contained no Colorado butterfly plants and, that in some areas containing PCEs were not present. Therefore, these areas were removed from this

unit. This unit has historically supported a number of Colorado butterfly plant populations in a variety of habitat types, and is located at the furthest point downstream within the Bear Creek drainage. Disconnected from other population gene pools, conditions surrounding subpopulations within this area are conducive to locally adapted genotypes not found in other populations. Special management in this unit may require timing the cutting of hay with fruit and seed set of the Colorado butterfly plant, and for the application of herbicides used to control noxious weeds.

Bear Creek West Unit

The Bear Creek West Unit consists of three stream reaches encompassing a total of 500 acres along 7.3 miles of stream within the Bear Creek drainage in Laramie County, Wyoming. This unit is primarily under private ownership, but includes some Wyoming State lands. This unit may require special management for appropriate levels of grazing needed to maintain open habitat, and the application of herbicides used to control noxious weeds.

Reach 1: Habitat within this reach is semi-moist meadows on flat benches and streambanks along an intermittent stream. Plants are most abundant in areas with low thistle density and heavily browsed willow, and are absent from adjacent, ungrazed areas with dense willow thickets (WYNDD 2004). Several subpopulations of Colorado butterfly plant were found during surveys of 2004 throughout this entire reach. This reach supports a large population with good reproduction and has good condition.

Reach 2: Habitat within this reach consists of hummocky banks of loamy clay soil and gravelly, sloping terraces in semi-moist, closely grazed *Poa pratensis* (Kentucky bluegrass)/*Elymus* spp. (wild rye) streamside meadow at the edge of dense *Carex aquatilis* (Nebraska sedge)/*Juncus balticus* (Baltic rush) community (WYNDD 2004). Several subpopulations of *Gaura neomexicana* ssp. *coloradensis* were found during surveys of 2004 throughout this entire reach. This location represents the uppermost elevation within the species' known range of occurrence. Historically it has supported a large population located in habitat that contains few threats; conditions that remain present today.

Reach 3: Habitat within this reach consists of three types--(1) Seasonally wet *Juncus balticus/Agrostis stolonifera* (redtop)/*Poa pratensis* community on subirrigated gravelly-sandy soil in low depressions a distance from the current stream channel; (2) streambank terraces of dark-brown loamy clay in dense *Helianthus nuttallii* (Nuttall's sunflower)/*Solidago canadensis* (Canada goldenrod)/*Phleum pratense* (timothy) grass community; and (3) grassy terrace dominated by *Agrostis stolonifera*, *Poa pratensis*, *Elymus smithii* (wild rye), and *Melilotus albus* (white sweetclover) on brown clay-loam (WYNDD 2004). Several subpopulations of *G. neomexicana* ssp. *coloradensis* were found during surveys of 2004 throughout this entire reach, including T18N R68W Section 21 and 22. There is a natural break in habitat approximately in the center of Section 21, at which point the PEMA habitat changes to scrub-shrub and continues upstream (to the southwest) through the remainder of Section 21. Critical habitat was not designated beyond this natural break.

Little Bear Creek/Horse Creek

The Little Bear Creek/Horse Creek Unit consists of two stream reaches encompassing a total of 807 acres along 11.7 miles of stream within the Little Bear Creek and Horse Creek drainages in Laramie County, Wyoming. This unit is primarily under private ownership, but includes some Wyoming State lands. This unit may require special management for appropriate levels of

grazing needed to maintain open habitat in some areas; special management to maintain surface or subsurface water flows; and for the application of herbicides used to control noxious weeds.

Reach 1: Surveys conducted during 2004 found scattered individual plants and subpopulations of Colorado butterfly plant throughout most of this reach. One or more PCEs were not present within the portions of this reach that the Service eliminated from the final critical habitat designation. Habitat throughout Little Bear Creek and the Paulson Branch stream reaches is primarily identified as PEMC intermixed with PEMA. This reach has supported a large number of subpopulations with a moderate-to-large number of plants over the years. Because this reach is reproductively isolated from any others, conditions surrounding resident subpopulations are conducive to locally adapted genetic variation important to future species persistence.

Reach 2: Surveys conducted during 2004 found many subpopulations and individual plants of Colorado butterfly plant throughout most of the Horse Creek drainage originally proposed as critical habitat, including Brunyansky Draw. One or more of the PCEs was not present within the Horse Creek drainage west of Interstate 25; therefore, the Service eliminated this portion of the original proposal from the final critical habitat designation. With the exception of the far eastern portion of the originally proposed reach, the remainder of the proposed reach within Horse Creek was included in a WEA for the conservation of Colorado butterfly plant, and was dropped from the final critical habitat designation. While the far eastern end of the proposed designation was not surveyed during 2004 (permission was not granted by the landowner), observations during 2004 surveys of adjacent land revealed the presence of PCEs and suitable habitat. This area is not included in a WEA, PCEs are present, many subpopulations were found during 2004 surveys on adjacent land, and the last surveys conducted in this area found Colorado butterfly plants, this portion of the proposed critical habitat was included in the final designation. The Service did not designate critical habitat beyond the center of Section 10 on the east end of this reach because the PCEs are not present.

Lodgepole Creek West

The Lodgepole Creek West unit consists of 902 acres along 12.7 miles of Lodgepole Creek in Laramie County, Wyoming (USFWS 2005). This unit is primarily under private ownership, but includes some Wyoming State lands. Subpopulations of the Colorado butterfly plant have been found along Lodgepole Creek from T16N 68W Section 24 on the western edge of this unit, extending 19 km (12 mi) of stream east to T15N R66W Section 3. Surveys conducted during 2004 revealed several subpopulations of Colorado butterfly plant present throughout T16N R67W Sections 19 and 20. Access was denied for 2004 surveys throughout the remainder of the unit. The Service finalized a WEA with the landowner of Sections 19 and 20 because the areas did not contain the PCEs for the Colorado butterfly plant. Sections 19, 20, and 24 were removed from this unit.

Habitat throughout the designated critical habitat stream reach is primarily identified as PEMC intermixed with PEMA. This unit has supported a large number of small, and a few large, subpopulations over the years in a variety of habitat types and land management practices. The number of subpopulations within the variety of habitat may represent a number of locally selected genotypes existing under conditions not found elsewhere, providing an important contribution to the long-term conservation of the species. This unit may require special management for appropriate levels of grazing needed to maintain open habitat in some areas, and management for reduced levels of grazing in others; special management to maintain surface or subsurface water flows; and the application of herbicides used to control noxious weeds.

Lodgepole Creek East Unit

The Lodgepole Creek East Unit consists of one stream reach encompassing a total of 378 acres along 5.2 miles of Lodgepole Creek in Laramie County, Wyoming (USFWS 2005). This unit is primarily under private ownership with some Wyoming State lands.

The area is managed for livestock grazing and hay production, mowed late in the season and used for winter pasture. Previous surveys found subpopulations of *Gaura neomexicana* ssp. *coloradensis* along Lodgepole Creek from Thompson Reservoir Number 2 in T14N R62W Section 4 on the eastern edge of this unit, extending west to T15N R64W Section 27 on the unit's western edge. However, 2004 surveys found neither subpopulations nor PCEs east of Section 32; therefore, the eastern end of this proposed unit was dropped from final critical habitat designation. Similarly, 2004 surveys found no subpopulations or PCEs necessary to provide suitable habitat in the entire eastern reach on the border of Wyoming and Nebraska (Reach 2 of the proposal); therefore, the Service eliminated the eastern reach of the proposal from final critical habitat designation.

While 2004 surveys found subpopulations of the Colorado butterfly plant throughout the originally proposed western reach (Reach 1) of this unit, WEAs were secured with several landowners throughout this area. Therefore, these areas were removed from this unit. For those areas designated as critical habitat, this stream reach is primarily identified as PEMC with sparse amounts of PEMA. This unit may require special management for appropriate levels of grazing needed to maintain open habitat in some areas, and management for reduced levels of grazing in others; special management to maintain surface or subsurface water flows; and the application of herbicides used to control noxious weeds.

Borie Unit

The Borie Unit consists of two stream reaches encompassing a total of 486 acres along 7.6 miles of Diamond Creek and Lone Tree Creek in Laramie County, Wyoming. This unit is primarily under private ownership, with some Wyoming State lands. This unit may require special management for appropriate levels of grazing needed to maintain open habitat in some areas, and management for reduced levels of grazing in others; the application of herbicides used to control noxious weeds; and preventing harmful habitat fragmentation from residential and urban development.

Reach 1: This population is confluent with another population downstream along Diamond Creek on WAFB. Subpopulations of Colorado butterfly plant have been found along Diamond Creek from the eastern boundary of this reach within T14N R67W Section 33, adjacent to WAFB, approximately 3.5 miles of stream southwest to T13N R67W Section 6. Subpopulations also have been found along smaller, unnamed tributaries to Diamond Creek from the eastern edge of T14N 67W Section 32 approximately 2 miles upstream within several small tributaries in Section 31 and T13N R67W Section 6.

Surveys conducted during 2004 found many subpopulations, including the largest subpopulation within the plant's known distribution, throughout all areas surveyed with the exception of two 0.5 mile stream segments within Reach 1--these stream segments were dropped from the final critical habitat designation because they did not contain PCEs. Because a WEA was secured to provide for the conservation needs of the Colorado butterfly plant within T13N R67W Sections 5 and 6, this portion of Reach 1 of the proposed critical habitat was dropped from the final designation. Similarly, because a WEA was secured to provide for the conservation of the only

known subpopulation found within Reach 2 of the proposal, and the remainder of the proposed Reach 2 contained neither Colorado butterfly plants nor PCEs, this entire reach was dropped from the final designation. Habitat throughout this entire reach is PEMC intermixed with PEMA. This reach supports a large number of plants within several subpopulations, conducive to the development of considerable local genetic variation contributing to the conservation of this species.

Reach 2: This reach was described as Reach 3 in the proposed critical habitat rule. Subpopulations of the Colorado butterfly plant have been found along Lone Tree Creek, from the northwest corner of T13N R67W Section 31, to 3 miles upstream to T13N R68W Section 26. Because a WEA has been secured to provide for conservation of the Colorado butterfly plant within Sections 25 and 26, this reach has been reduced in size accordingly for the final critical habitat designation. This creek segment occurs at the southernmost point of the plant's distribution within Wyoming, with very little possibility for genetic exchange between local subpopulations and other populations that may be in the general area. Conditions are conducive to locally adapted subpopulations containing genetic variability important to the species' long-term persistence.

Factors Affecting the Colorado Butterfly Plant Critical Habitat within the Action Area

Federal actions that, when carried out, funded or authorized by a Federal agency, may destroy or adversely modify critical habitat for Colorado butterfly plant include, but are not limited to: (1) any activity that results in development or alteration of the landscape within a unit, including land clearing; activities associated with construction for urban and industrial development, roads, bridges, pipelines, or bank stabilization; agricultural activities such as plowing, disking, haying, or intensive grazing; off-road vehicle activity; and mining or drilling of wells; (2) any activity that results in changes in the hydrology of the unit, including construction, operation, and maintenance of levees, dams, berms, and channels; activities associated with flow control (e.g., releases, diversions, and related operations); irrigation; sediment, sand, or gravel removal; and other activities resulting in the draining or inundation of a unit; (3) any sale, exchange, or lease of Federal land that is likely to result in the habitat in a unit being destroyed or appreciably degraded; (4) any activity that detrimentally alters natural processes in a unit including the changes to inputs of water, sediment and nutrients, or that significantly and detrimentally alters water quantity in the unit; and (5) any activity that could lead to the introduction, expansion, or increased density of exotic plant or animal species that are detrimental to the Colorado butterfly plant and to its habitat. Federal actions not affecting listed species or critical habitat and actions on non-Federal lands that are not federally funded or permitted do not require section 7 consultation.

Ute Ladies'-tresses Environmental Baseline

For the purposes of this consultation, the Service defines the action area to include all floodplain areas in the Rawlins Resource Area where the Bureau has discretionary authority over activities within suitable Ute ladies'-tresses habitat. These areas are located where the water table is near the surface throughout the Ute ladies'-tresses growing season (BLM 2005e).

The past and present impacts to Ute ladies'-tresses in the action area may have included increases or decreases in habitat suitability due to irrigation developments and other human-caused changes to stream hydrology. Human-caused changes to stream hydrology have taken the form

of channelization of streams, construction and use of irrigation canals, water impoundment (pond) construction, increased water discharges to surface waters, and water depletions from surface waters. These activities are widespread across the Rawlins Resource Area and many historical projects exist that have changed stream hydrology.

Invasive plant species do occupy much of the resource area and herbicide use to control these invasive species has been undertaken by private citizens or performed by County Weed and Pest Districts. It has not been observed at present that any invasive plants may be adversely impacting any Ute ladies'-tresses plants within the action area.

Livestock grazing, haying, or mowing occur within the Rawlins Resource Area. Grazing activities on Bureau-administered lands are authorized by the Bureau through a permitting process. Grazing, haying and mowing activities are normally undertaken by private land owners as part of their agricultural operations. These activities may be beneficial to Ute ladies'-tresses plants through the maintenance of habitat or they may be detrimental in that these activities if not timed properly may reduce the reproductive success of individual Ute ladies'-tresses plants.

Another impact to Ute ladies'-tresses plants in the action area may be herbivory by wildlife. Herbivory of the flowering spikes of S. diluvialis by voles (Arft 1994), deer (Fertig 2000a), and moose (Moseley 1998) is frequent at some locations. Wells (1967) documented significant flowering stalk herbivory of the autumn ladies'-tresses orchid by rabbits. Arft (1994) speculated that vole herbivory could be the greatest single threat to the long-term survival of Ute ladies'-tresses at one study site. It is plausible that similar damage to Ute ladies'-tresses plants in the action area could be attributed to wildlife as well.

Numerous other existing actions including electricity transmission lines, mining operations, and telecommunication towers are present in the action area. These have been considered as part of the environmental baseline for this action.

Status of the Ute Ladies'-tresses Within the Action Area

Although no Ute ladies'-tresses are known to occur on Bureau-administered lands, or on lands where the Bureau manages the subsurface (split-estate lands) in the Rawlins Resource Area, the location of known populations in this resource area makes its occurrence possible. The Bureau supports efforts to locate the orchid on Bureau-administered or nearby state or private lands (see Hazlett 1995, 1997, 1999). Surveys have been conducted in what appeared to be suitable habitat in some parts of the action area but no Ute ladies'-tresses have been found to date. Ute ladies'-tresses have been located on nearby private lands and future surveys may reveal that populations do occupy Bureau-administered surface lands, or on private lands where the Bureau may have some discretionary authority of grazing management through the allotment management plans of allotments containing isolated Bureau-administered grazing parcels [section 15 parcels as defined by the Taylor Grazing Act of 1934 (43 USC 315)] in the action area.

Within the Rawlins Resource Area, potentially suitable habitat exists along creeks, streams, and riparian areas that may support Ute ladies'-tresses. Locations where population of Ute ladies'-tresses may be discovered in the Rawlins Resource Area include but are not limited to moist meadows along streams.

Don Hazlett, a botanical consultant under contract to the Bureau, also surveyed public and private lands in southeast Wyoming and Nebraska and discovered new populations in Niobrara and Laramie counties (Hazlett 1995, 1997, 1999). Some of the populations discovered by Hazlett (1996) in Niobrara county were located on private land over which the Bureau has no discretionary authority. The number of individuals seen at 5 separate locations varied from 2 to 40 individuals. These private land areas had been grazed in the riparian areas near the Niobrara River. Hazlett (1996) thought that grazing and climate, such as high rainfall during 1995, may have contributed to the survival and success of these orchid populations.

Factors Affecting the Ute Ladies'-tresses Within the Action Area

Factors that could affect this orchid in the action area include irrigation developments and other human-caused changes to stream hydrology, introduction of invasive species, herbicide use, haying, mowing, or livestock grazing (USFWS 1995a). Human-caused changes to stream hydrology may take the form of channelization of streams, construction and use of irrigation canals, water impoundment (pond) construction, increased water discharges to surface waters, and water depletions from surface waters. These activities are widespread across the Rawlins Resource Area and many historical projects exist that have changed stream hydrology. Invasive plant species do occupy much of the resource area and herbicide use to control these invasive species may be undertaken by private citizens or performed by County Weed and Pest Districts. Depending on the time of the year when it occurs, grazing may be either detrimental or beneficial to Ute ladies'-tresses populations. If it occurs during the flowering stage, grazing may reduce the plant's reproductive capacity through removal of the inflorescences (flowering spikes) of individual Ute ladies'-tresses plants. However, if timed to occur prior to or subsequent to the plant's flowering stage, grazing may also be beneficial by reducing the density of competing vegetation thereby helping to maintain the plant's habitat.

Blowout Penstemon Environmental Baseline

For the purposes of this consultation, the Service defines the action area to include all sand dune areas in the Wyoming Bureau's Rawlins Resource Area, where the habitat conditions are suitable and may support blowout penstemon populations, and that could potentially be impacted by decisions made in the Wyoming Bureau's Rawlins RMP.

The past and present impacts to blowout penstemon in the action area may have included increases or decreases in habitat suitability due to management of these sand dune habitats by the Bureau. Livestock grazing does occur within the Rawlins Resource Area and has occurred there for at least the last 100 years. Grazing activities on Bureau-administered lands are authorized by the Bureau through a permitting process. Many potential impacts to blowout penstemon plants from grazing activities managed according to the Rawlins RMP have been sufficiently minimized so that these activities will likely not affect many blowout penstemon plants in the Rawlins Resource Area. For a complete list and discussion on these activities, see Appendix III.

Because of the remoteness of the blowout penstemon sites in Wyoming, these areas are not regularly accessed by Bureau-employees or the public. Although individual plants could undergo significant effects from cattle grazing, only minor effects from cattle grazing on the blowout penstemon populations in Wyoming are currently known.

Status of the Blowout Penstemon Within the Action Area

In Wyoming, blowout penstemon populations are known to occur on lands managed by the Bureau as well as lands managed by the State of Wyoming within Carbon County under the jurisdiction of the Rawlins RMP. The habitat of surrounding areas makes the potential for occurrence in other locations possible. The Bureau supports efforts to locate the plant on Bureau-administered or other nearby lands (see Heidel 2005b, 2005c).

Within the Rawlins Resource Area, potential habitat exists that may support additional blowout penstemon populations. In the future, new locations of blowout penstemon may be discovered in areas managed according to the Rawlins RMP.

Factors Affecting the Blowout Penstemon Within the Action Area

Livestock grazing activities as authorized under the Rawlins RMP may affect the blowout penstemon within the action area. Protective measures (see Appendix I) included in the Rawlins RMP should minimize all threats from authorized Bureau activities to the blowout penstemon except the threat of grazing cattle foraging on or trampling portions of the blowout penstemon plants.

Other factors for which the Bureau has no discretion or control over which could affect the blowout penstemon within the action area include: (1) drought, (2) illegal or unauthorized activities (such as OHV use in the sand dune habitat, collection of blowout penstemon by rare plant enthusiasts, etc.), (3) introduction of noxious weeds or disease (fungal root rot), (4) grazing or trampling by wild ungulates (deer, elk, antelope) or rodents, (5) burial of the plants in the windblown sand, (6) destruction or elimination of the pollination (insects) or seed dispersal (potentially grazing ungulates) mechanisms of the blowout penstemon or (6) rare stochastic events.

EFFECTS OF THE ACTION

The Rawlins RMP BA describes activities in a number of programs that are likely to adversely affect the bald eagle, Preble's and its designated critical habitat, Colorado butterfly plant and its designated critical habitat, Ute ladies'-tresses, and blowout penstemon. The potential effects of these activities are described here.

Direct and Indirect Effects

Direct effects are effects that result directly or immediately from the proposed action on the species. For example, actions that would immediately remove or destroy habitat or displace the species from its habitat or an area would be considered direct effects. Indirect effects are effects that are caused by, or result from, the proposed action and occur later in time after the proposed action is completed, e.g., grazing over the life of the RMP (10-15 years) may maintain habitat for listed plants that may occupy the area 15 years from present.

The Proposed Action is the management of the Rawlins Resource Area in Wyoming for up to 10-15 years. Since (1) there is such a lengthy time period for the life of the proposed action, (2) direct effects could occur under the proposed action for up to 15 years, and (3) the indirect

effects resulting from the proposed action may be combined with direct effects or be sufficiently difficult to distinguish from direct effects, the two types of effects are not differentiated here but instead are discussed jointly.

Effects on the Bald Eagle

Potential effects could result from (1) the displacement of bald eagles from the area by human activity (e.g., nest or roost site disturbance), (2) loss or alteration of habitat associated with the proposed action, or (3) death of bald eagles as a result of electrocution by or collision with power distribution lines or other structures necessary for mineral development.

Analysis for Effects of the Action on the Bald Eagle

Lands and Realty.
Under the Lands and Realty Program, the Bureau authorizes sales and exchanges, and acquires and designates rights-of-way access to serve administrative and public needs. Transferring land containing bald eagle habitat out of Bureau ownership could result in negative consequences to bald eagles as the new land manager could change the habitat making it unsuitable for bald eagles (i.e., urban development, etc) possibly leading to loss of nesting or roosting habitat, adult mortality, mortality of young, or loss of reproductive capacity. Conversely, if the Bureau obtains bald eagle habitat under the Lands and Realty Program, beneficial effects to bald eagles may be realized in the form of beneficial federal management for bald eagles and their habitats.

Rights-of-way for access roads, pipelines, communication sites, wind energy generation facilities, irrigation ditches, and electrical distribution lines associated with oil and gas wells and production facilities are also granted under the auspices of the Bureau's Lands and Realty Programs. These rights-of-way may be temporary or extended for two years or longer. Rights-of-way could result in loss of nesting or roosting habitat, adult mortality, mortality of young, or loss of reproductive capacity of bald eagles from (1) increased human presence in bald eagle habitat potentially disrupting normal bald eagle behavior patterns, (2) bald eagle collisions with vehicles, towers, associated guy wires, or wind energy generating facilities resulting in injuries to bald eagles and mortality, or (3) electrocutions from power distribution lines. These impacts may result in death, harm or harassment, in the form of inability to forage, roost, or reproduce. Nesting or roosting bald eagles could also be affected by a change in land ownership which could occur due to transfer, exchange, or sale of property. New land ownership would bring new land management and new activities could conceivably occur at that time which may harm, harass, or kill bald eagles due to development of industry, residential areas, or destruction of bald eagle habitat. Because lands and realty management activities have the potential to disturb or alter bald eagle foraging, nesting or winter roosting behaviors or cause mortality of bald eagles, this program could result in adverse impacts to the bald eagle in the Rawlins Resource Area.

Minerals and Geology.
Minerals and geology management activities may occur in bald eagle habitat in the Rawlins Resource Area. Minerals and geology management activities may alter bald eagle behavior. Minerals and geology management operations are most likely to influence foraging eagles and may deter them from otherwise suitable foraging habitats. Minerals and geology management for which the Bureau has a specific interest or issues a right-of-way would not result in a direct loss of nesting habitat. Loss of potential habitat on private lands due to mining activities is possible but any future operations are unknown at this time. Minerals and geology management

within unoccupied suitable habitats may deter eagles from establishing new nest and winter roost sites. Because minerals and geology management activities have the potential to disturb or alter bald eagle foraging, nesting or winter roosting behaviors, this program could result in adverse impacts to the bald eagle in the Rawlins Resource Area.

Powerlines and wind power associated with leases or units within the minerals program may cause behavioral avoidance of these areas by the eagles. It may also result in harm or death of eagles by collision with vehicles during construction and/or use of the roads associated with these actions as well as other human activities. To avoid electrocution of bald eagles, any power line construction will follow recommendations by the APLIC (2006). 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 a chance that an eagle could be electrocuted or collide with a line.

To minimize effects from the Lands and Realty Program and the Minerals and Geology Program to bald eagles, the Bureau has committed to protecting nests and roosts with buffer zones. This will minimize human disturbance and restrict potentially disturbing activities around these sensitive areas. The Bureau will ensure that surveys for bald eagle nests and roosts are conducted prior to authorization of activities that may disturb bald eagles. The Bureau will also monitor authorized and casual use activities that may adversely impact bald eagles and restrict these activities where necessary. In addition to these conservation measures, the Bureau in the Rawlins Resource Area is also committed to verifying the status (active vs. inactive) of known bald eagle nests, communal roosts, or concentration areas. For a complete list of conservation measures to which the Bureau is committed to implementing, see Appendix I.

Summary of Effects on the Bald Eagle

It is anticipated that many actions potentially-authorized under this RMP if they were undertaken could result in negative impacts to the bald eagle due to (1) human disturbance of nesting, roosting, or foraging eagles either on Bureau-administered lands or to bald eagles on private parcels which have bald eagle territories overlapping Bureau-administered lands, (2) collision with vehicles, towers, or other facilities, (3) electrocution from contact with energy distribution lines, (4) poisoning or trap-related harm from authorized predator control activities targeted at other species, or (5) modification of bald eagles habitats. Thus, potentially-authorized actions of the Bureau could lead to (1) nest or roost abandonment causing impaired or lost reproductive capacity or mortality or young, (2) habitat change resulting in a decrease in the ability of eagles to find suitable breeding, shelter, or foraging areas or adequate prey base, or (3) physical harm or death to bald eagles.

Effects on Preble's Meadow Jumping Mouse (Preble's)

Potential effects could result from (1) the use of heavy earth-moving construction equipment and the possibility that Preble's mice could be displaced, harassed, harmed, buried, crushed, drowned, or otherwise killed during implementation of the proposed action, or (2) the removal of vegetation and subsequent earth-moving activities associated with development of roads, pipelines, or reservoirs could result in the inability of Preble's mice to forage or find cover resulting in their inability to survive.

Analysis for Effects of the Action on Preble's

The Bureau has identified activities in two management programs which may be implemented in Preble's habitat over the life of the Rawlins RMP and if the activities were so implemented, they would likely adversely affect Preble's. These two programs are the (1) Lands and Realty Management Program and (2) Livestock Management Program.

Bureau-administered lands in the Rawlins Resource Area may contain suitable habitat for Preble's. Adverse impacts may occur to Preble's as a result of Bureau-authorized actions in areas of suitable Preble's habitat on (1) Bureau-administered lands, and (2) private, State, municipally-owned, or U.S. Forest Service-administered lands. Some activities identified by the Bureau which may affect Preble's on non-Bureau-administered lands would not occur but for the authorization of certain Bureau-authorized activities on Bureau-administered lands. However, the Bureau may only have limited capabilities and limited authority to minimize impacts to Preble's on properties which are not under its ownership and administration.

Analysis for the effects of the Lands and Realty Management Program on Preble's. Rights-of-way (ROWs) and leases for pipelines, roads (including stream crossings), and reservoirs within the Lands and Realty Management Program of the Rawlins RMP may affect Preble's. The crossing of Preble's habitat by heavy earth-moving equipment, though minimized through conservation measures on Bureau-administered lands may result in accidental crushing, dismembering, suffocating, or burying of a Preble's leading to harm or death either on Bureau-administered lands or on private, state, municipally-owned, or U.S. Forest Service-administered properties over which the right-of-way may also be authorized.

Construction activities associated with issuance of ROWs and leases for pipelines, roads, and reservoirs may increase the potential for the harm or death of a Preble's. There could be localized impacts to populations and habitat in areas where construction and maintenance were to occur. The removal of vegetation and the compaction of soils caused by heavy equipment used to clear ROWs for roads, pipelines, or reservoirs would create disruption of travel corridors or elimination or modification of vegetation and habitat necessary for survival of the mouse. When authorizing a ROW, the Bureau generally authorizes the development perpendicularly across any given stream. This would minimize impacts to Preble's in suitable Preble's habitat on Bureau-administered lands.

Pipeline, road, or reservoir construction may affect Preble's habitat through clearing of the ROWs in riparian areas and the placement of temporary use areas/staging areas within adjacent upland habitats. The removal of shrub and herbaceous vegetation and digging of a pipeline trench within the ROW may affect Preble's ability to (1) forage by reducing or degrading vegetation and/or creating a barrier to foraging areas previously used by Preble's, (2) travel to adjacent habitats due to the potential reluctance to cross an area devoid of vegetation, (3) hibernate if the ROW occurs in habitat preferred by Preble's for hibernation and the Preble's may be displaced to marginal hibernation habitat where survivability over winter is reduced, (4) reproduce due to loss of mouse-nesting cover and changes in immigration and emigration resulting in loss of genetic exchange, and (5) avoid predation while utilizing the ROW or areas adjacent to it. However, through the Bureau's Conservation Measures (See Appendix I), the effects of the ROW will be minimized.

Pipeline, road, or reservoir construction may disrupt habitat connectivity as above if it results in a barrier to Preble's movement along the riparian corridor. It is unknown if continuity of riparian vegetation is critical for Preble's movement or if they will venture across open areas. A ROW devoid of vegetation may disrupt immigration/emigration of Preble's, social interactions, foraging ability, dispersal of young and reproductive potential if a barrier is placed between individuals of a population. Overall this may result in reduced survivability of individuals and/or their young. Preble's is highly mobile for a small mammal and may move one mile in one night (Shenk and Sivert 1999a). Therefore, when construction activities have ceased, it is likely that Preble's will move across an open area when suitable habitat occurs on both sides. Through the Bureau's conservation measures, the Bureau is committed to minimizing the size of ROWs in Preble's habitat and to allow for the re-establishment of shrubs and herbaceous cover, where applicable. Habitat connectivity is restored for pipeline via re-vegetation techniques ROWs and over time connectivity would be expected to be returned to pre-construction levels.

In areas of occupied Preble's habitat, pipeline, road, or reservoir construction may cause direct mortality of individuals if they occur in an area of human activity. Preble's individuals that attempt to cross an area with reduced vegetation make themselves more vulnerable to predation. Foraging ability may also be impaired due to a potential barrier to foraging habitat resulting in a reduction of survivability of Preble's individuals and their young. Impaired foraging ability may also result in Preble's entering hibernation with less than adequate fat reserves to survive their nearly eight month hibernation period. Adults that do survive may enter the breeding period with reduced fitness resulting in reduced reproductive potential. Individual mice occurring above ground during construction are believed to be mobile enough to escape equipment; however, those that are below ground in burrows are at risk of being crushed. In the event that construction and/or excavation occur during the hibernation or breeding season, hibernating or new born Preble's may be subject to disturbance and likely death. These effects, while possible, are considered minimal and virtually immeasurable. The Bureau's Conservation Measures are directed at reducing the likelihood of encountering Preble's or its habitat in the ROW prior to construction and moving through and reclaiming the area as quickly as possible to minimize direct and indirect disturbances to Preble's.

Issuing ROWs through Preble's habitat may (1) alter the existing vegetation composition in Preble's habitat and may allow noxious weeds to invade and perhaps create a permanent travel barrier for Preble's or convert suitable habitat to non-habitat, (2) contaminate the water in the riparian area due to an accidental fuel/oil spill from construction equipment causing death to individual mice who enter the stream and/or changes to soil and vegetation health along the riparian edge, and (3) may result in sporadic disruption to feeding, breeding and sheltering activities from ongoing maintenance activities. Provided that the Bureau implements measures to protect adjacent riparian areas (riprap, vehicle inspections), the likelihood of degradation of riparian areas due to runoff or spills is low.

To date, the Service is not aware of any pipelines/ROWs through Preble's habitat which have occurred as a result of Bureau-authorized actions although one application (Overthrust to Opal pipeline project) is currently pending approval in the Rawlins Resource Area. For the purposes of this consultation, we assume that up to ten pipelines/rights-of-way may pass through Preble's habitat over the life of the Rawlins RMP (10-15 years) as a result of Bureau-permitted actions. With this estimate, it can be reasonably assumed given past impacts to Preble's habitat from permitted pipelines/ROWs that a small amount (0.1-5.0 acres/project) of habitat may be temporarily disturbed during project implementation. However, it is anticipated that this

disruption of habitat will be minimized and temporary. The Bureau will require the use of its committed conservation measures (see Appendix I) on portions of the projects which cross Bureau-administered properties and encourage the use of the conservation measures on portions of the project which cross private, State, municipally-owned, or Forest Service-administered lands. These Bureau-committed conservation measures will include minimization of disturbance and revegetation of the disturbed areas to pre-project vegetation types.

Reservoirs, if constructed in Preble's habitat would be expected to inundate the mouse's habitat potentially drowning any young Preble's, destroying any Preble's mouse-nests located there, and eliminating its habitat locally. The Bureau has authorized only a few reservoirs in the last ten years in the vicinity of Preble's habitat and it can be reasonably expected that a few applications for these could be received by the Bureau in or adjacent to areas of Preble's habitat over the life of the Rawlins RMP.

The Bureau will evaluate any proposed ROW and lease applications to determine their potential impacts to Preble's. Where Preble's habitat is identified in any given project area, surface disturbing and destructive activities will be limited during critical time periods and within 100 meters of the 100-year flood plain, reducing disturbance and loss to the mouse and the habitat (see Appendix I for Bureau-committed conservation measures).

Analysis for the Effects of the Livestock Grazing Management Program on Preble's. The Bureau has determined that development of livestock water facilities such as water catchments, reservoirs, springs, pipelines, stream exclosures, and wells, as authorized under the livestock management program may also affect the Preble's meadow jumping mouse in the Rawlins Resource Area. Riparian exclosures would be expected to improve riparian health by eliminating vegetation removal, soil compaction, or stream-side erosion caused by livestock grazing. However, the increased human activity during fence and exclosure construction operations associated with water facilities developments could temporarily displace Preble's. Vehicle and heavy equipment use and the associated moving of soil, rocks, and vegetation during construction and maintenance of these water development facilities may result in the loss or harm of a Preble's due to crushing, drowning, or displacement to less suitable habitat.

The majority of suitable Preble's habitat in Wyoming was settled and converted to either State or private ownership in the late 1800's and early 1900's. Currently, there are only small relatively isolated parcels of Bureau-administered lands located in suitable Preble's habitat in the Rawlins Resource Area. Livestock grazing on the Bureau-administered small isolated parcels is authorized according to section 15 of the Taylor Grazing Act. Under section 15 of the Taylor Grazing Act, grazing is authorized under a grazing "lease" rather than a grazing "permit". Because the Bureau only owns a minor portion of any given section 15 grazing allotment, the Bureau has limited control over the activities occurring over the majority of the allotment. The Bureau has committed, to the extent of its project-authorization capabilities, to minimize impacts from water development activities and riparian areas grazing management to the Preble's mice in section 15 grazing allotments of the Rawlins Resource Area.

The Wyoming Bureau in the Rawlins Resource Area has committed to a number of conservation measures to minimize impacts to Preble's on Bureau-administered properties. These non-discretionary conservation measures will be implemented by the Bureau on Bureau-administered lands in suitable habitat for Preble's. These conservation measures were developed as a result of coordination activities between the Service and the Bureau regarding the Bureau's draft

Statewide Programmatic Preble's Meadow Jumping Mouse Biological Assessment. These conservation measures are intended to minimize effects by reducing the likelihood that ground disturbing activities will occur in areas occupied by Preble's and by re-establishing vegetation in areas of disturbed Preble's habitat.

1. Surface disturbing and other disruptive activities will be intensively managed to maintain or enhance identified potential habitat [within 100 meters (330 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.
2. In habitat suitable for the Preble's meadow jumping mouse, prescribed fire will be designed to burn no more than 25 percent 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 Service. Because of the unpredictability of fire, this measure will be achieved if no more than 1 of every 4 fires exceeds the 25 percent limit in size. If more than 2 of the first 8 fires in Preble's habitat exceed 25 percent of the suitable habitat, the Bureau will consult with the Service to revise this standard.

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

4. Surface disturbing and other disruptive activities located within identified or known breeding habitat within 100 meters (330 feet) of the identified 100-year flood plain for the Preble's meadow jumping mouse will not be allowed between May 15 and August 15 for the protection of the mouse.

5. Surface disturbing and other disruptive activities located within 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.

Summary of Effects on Preble's

It is anticipated that activities associated with the Rawlins RMP Lands and Realty Program and the Livestock Management Program if they were undertaken would be likely to adversely affect Preble's. In particular, the Bureau's permitting of rights-of-way for pipelines, roads, and reservoirs under its Lands and Realty Program and the development of livestock watering facilities under its Livestock Management Program could result in harassment, harm, displacement, reduced reproductive capacity, or death to individual Preble's mice. However, water facility development could also have beneficial effects to Preble's and its habitat, as riparian areas and associated Preble's habitat may be expanded or protected by the development of any given reservoir or livestock watering facility. The Bureau has committed to a number of conservation measures to minimize disturbance to or the likelihood of harm or death to Preble's on Bureau-administered properties as a result of the Bureau's management actions (Appendix I).

Effects on Preble's Critical Habitat

Only activities under the Lands and Realty Management Program and the Livestock Management Program were identified as having potentially likely adverse effects to Preble's

critical habitat. The potential effects of activities under these programs on Preble's critical habitat are described here.

Potential effects could result from (1) the use of heavy earth-moving construction equipment and the possibility that Preble's critical habitat could be modified or destroyed during implementation of this activity, (2) the removal of vegetation and subsequent earth-moving activities associated with development of roads, pipelines, or reservoirs could result in the inability of Preble's critical habitat to provide the primary constituent elements necessary for Preble's to forage, find cover, or breed resulting in their inability to survive.

Specifically, the pattern of dense riparian vegetation consisting of grasses, forbs, and shrubs in areas along rivers and streams that provide open water through Preble's active season may be eliminated by direct removal of the vegetation. Adjacent floodplains and vegetated uplands may become disturbed or manipulated by human intervention. Areas that provide connectivity between and within populations may become fragmented and disjunct. Furthermore, dynamic geomorphological and hydrological processes may no longer maintain the processes that create and maintain river and stream channels, floodplains, and promote patterns of vegetation favorable to Preble's.

Analysis for Effects of the Action on Preble's Critical Habitat

The Bureau has identified activities in two management programs which may, if implemented, be likely to adversely affect Preble's designated critical habitat over the life of the Rawlins RMP. These two programs are the (1) Lands and Realty Management Program and (2) Livestock Management Program. Critical habitat for Preble's has been designated on private, State, municipally-owned, or U.S. Forest Service-administered lands in the Bureau's Rawlins Resource Area. Critical habitat <u>has not</u>, however, been designated on <u>Bureau-administered lands</u> in the Rawlins Resource Area.

The primary constituent elements of Preble's designated critical habitat may be adversely affected on private, State, municipally-owned, or U.S. Forest Service-administered lands in the Bureau's Rawlins Resource Area. Some activities identified by the Bureau which may affect Preble's designated critical habitat on non-Bureau-administered lands would not occur <u>but for</u> the authorization of certain Bureau-authorized activities. However, the Bureau may only have limited capabilities and limited authority to detect or minimize impacts to Preble's designated critical habitat on properties which are not under its ownership and administration.

Although no designated critical habitat for Preble's is located on Bureau-administered lands, the Cottonwood Creek, Chugwater Creek, and Lodgepole Creek and Upper Middle Lodgepole Creek designated critical habitat units do cross the Rawlins Resource Area. The Cottonwood Creek, Chugwater Creek and Lodgepole Creek and Middle Lodgepole Creek units are collectively composed of 10,542 acres of Preble's habitat extending for a total of 125.1 stream miles on private, State, municipal, or U.S. Forest Service administered lands.

On Bureau-administered surface acres, the Bureau has committed to implementing conservation measures for the protection of Preble's habitat. The Bureau will encourage the use of these conservation measures to protect Preble's critical habitat on private, State, municipally-owned, or U.S. Forest Service-administered lands which may be affected as a consequence by actions authorized on Bureau-administered lands.

Analysis for the effects of Rights-of-way for Pipelines and Roads on Preble's Critical Habitat. There is no designated critical habitat for Preble's on Bureau-administered properties. However, rights-of-way (ROWs) and leases for pipelines, roads (including stream crossings) authorized under the Lands and Realty Management Program of the Bureau's Rawlins RMP may still adversely affect Preble's designated critical habitat. The crossing of Preble's designated critical habitat by heavy earth-moving equipment may result in adverse effects to the primary constituent elements of Preble's designated critical habitat. Such impacts to Preble's designated critical habitat on private, state, municipally-owned, or U.S. Forest Service-administered lands, in some cases, may not be expected to occur but for the authorization of a ROW by the Bureau across Bureau-administered properties. The Bureau likely would not have the ability to conduct surveys, assess habitat, implement conservation measures, or designate the route of any give ROW on lands which are not under its administration. Effects could potentially occur to Preble's critical habitat on private, State, or municipally-owned lands as a result of a ROW issued on Bureau-administered property without the Bureau's knowledge.

The removal of vegetation and the compaction of soils caused by heavy equipment used to create ROWs for roads, pipelines would create localized impacts to the habitat. When authorizing a ROW, the Bureau would encourage that project proponents perpendicularly cross any given stream in Preble's critical habitat.

Pipeline or road construction on private, state, municipally-owned, or U.S. Forest Service-administered lands may affect Preble's critical habitat through clearing of ROWs in riparian areas and the placement of temporary use areas/staging areas within adjacent upland habitats. The removal of shrub and herbaceous vegetation and digging of the pipeline trench within the right of way may affect the primary constituent elements of Preble's critical habitat by (1) reducing or degrading vegetation and/or creating a barrier along travel corridors disrupting habitat connectivity, (2) manipulating the hydrologic regime of the riparian area, or (3) compacting the soil. The pattern of dense riparian vegetation consisting of grasses, forbs, and shrubs in areas along rivers and streams may be eliminated by direct removal of the vegetation. Adjacent floodplains and vegetated uplands may become disturbed or manipulated by human intervention. Areas that provide connectivity between and within populations may become fragmented and disjunct. Dynamic geomorphological and hydrological processes may no longer maintain the processes that create and maintain river and stream channels, floodplains, and promote patterns of vegetation favorable to Preble's.

The Bureau will encourage the use of its committed conservation measures (See Appendix I) on lands which are not under its administration. The use of these conservation measures will minimize impacts to the primary constituent elements of Preble's critical habitat. Disruptions of habitat connectivity would be temporary and over time connectivity would be expected to return to preconstruction levels.

Creating ROWs through Preble's designated critical habitat may (1) alter the existing vegetation composition in Preble's habitat allowing noxious weeds to invade and perhaps create a permanent travel barrier or convert suitable habitat to non-habitat, and (2) contaminate the water in the riparian area due to an accidental fuel/oil spill from construction equipment. Provided that any given project proponent operating off of Bureau-administered lands implements the Bureau's conservation measures to protect adjacent riparian areas, the likelihood of degradation of Preble's critical habitat due to runoff or spills is low.

To date, the Service is not aware of any pipelines/ROWs through Preble's critical habitat which have occurred as a result of Bureau-authorized actions. For the purposes of this consultation, we assume that up to four pipelines/rights-of-way may pass through Preble's critical habitat on private, State, municipally-owned, or Forest Service-administered lands over the life of the Rawlins RMP (10-15 years) as a result of Bureau-permitted actions. With this estimate, it can be reasonably assumed given past impacts to Preble's habitat from permitted pipelines/ROWs that a small amount (0.1-5.0 acres/project) of habitat may be temporarily disturbed during project implementation. However, it is anticipated that this disruption of habitat will be minimized and temporary. The Bureau will encourage the use of its committed conservation measures (see Appendix I) on portions of the projects which cross private, State, municipally-owned, or Forest Service-administered Preble's critical habitat. These Bureau-committed conservation measures will include revegetation of the disturbed areas to pre-project vegetation types.

Analysis for the Effects of Water development facilities on Preble's Critical Habitat. Water developments such as water catchments, reservoirs, spring developments, pipelines for water distribution, stream exclosures, and wells, if constructed in the same watershed as Preble's critical habitat could cause hydrologic changes to that watershed. These potential changes could adversely affect some portions of Preble's critical habitat. Changes could include inundation of the mouse's habitat, reduction of stream flow, an increase in water retention in the underground portions of the mouse's critical habitat, or a lowering of the water table. These potential changes could be negative or beneficial to Preble's critical habitat depending on their placement within the watershed.

The Bureau has no Preble's designated critical habitat on the lands which it administers. However, water facilities could conceivably be developed on Bureau-administered lands, or on privately-owned portions of section 15 grazing allotments, through the Bureau's authorization process within the same watershed as Preble's critical habitat. The Bureau has authorized only a few reservoirs within the range of Preble's within the last 10 years. It can be reasonably expected that a few applications for these could be received by the Bureau in the same watersheds as Preble's critical habitat over the life of the Rawlins RMP. The Bureau will assess individual site-specific impacts to Preble's critical habitat upon receiving any livestock water development applications and will assess, minimize, and/or eliminate potential impacts to Preble's critical habitat by re-locating, modifying, or denying approval for any given water development facility project proposal after it is received. The Bureau is committed to not adversely modifying any portion of Preble's critical habitat as a consequence of its discretionary actions.

Summary of Effects on Preble's Critical Habitat

It is anticipated that some activities associated with the Rawlins RMP Lands and Realty Program and the Livestock Management Program if they were undertaken may be likely to adversely affect Preble's designated critical habitat. In particular, the Bureau's permitting of rights-of-way or leases for pipelines, roads, reservoirs or other watering facilities could result in a reduction of the primary constituent elements of the critical habitat to sustain a viable population of Preble's. However, development of some water facilities could also have beneficial effects and expand the suitability of the designated critical habitat to support Preble's.

Effects on Colorado Butterfly Plant

The Rawlins RMP BA for the Colorado butterfly plant describes activities in the Livestock Grazing program that may affect and are likely to adversely affect the Colorado butterfly plant over the life of the Rawlins RMP. These effects are (1) the trampling, consumption, or destruction of individual Colorado butterfly plants by livestock grazing and (2) any manipulation of the timing or intensity or cessation of grazing of the habitat of this plant. The potential effects of these activities on the Colorado butterfly plant are described here.

Potential effects could result from direct damage to individual Colorado butterfly plants from grazing, trampling of the flowering parts of the plant or from grazing of the flowering parts of the surrounding vegetation. Loss of habitat could also occur if the Bureau did not permit livestock grazing activities and Colorado butterfly plant habitat was not maintained in suitable condition.

Analysis for Effects of the Action on Colorado Butterfly Plant

Analysis for the Effects of Livestock Grazing on Colorado butterfly plant. Habitat alterations resulting from agricultural use (grazing) may be beneficial, neutral, and/or detrimental to the Colorado butterfly plant depending on when it occurs (Fertig 2001a, Munk *et al.* 2002).

Grazing by cattle may be a threat at some sites, especially if animals are not periodically rotated or if use is concentrated in small areas during the summer flowering period. Potential effects could result from direct damage to individual Colorado butterfly plants from grazing, trampling of the flowering and vegetative parts of the plant. Trampling or overgrazing of Colorado butterfly plants may occur as livestock graze grasses, forbs, and other vegetation normally present in riparian areas.

Studies have shown that the Colorado butterfly plant may persist and thrive in habitats that are winter grazed or managed on a short-term rotation cycle (Fertig 1994, Mountain West Environmental Studies 1985). Although reproductive individual Colorado butterfly plants may be grazed (the plant is quite palatable to a wide range of herbivores), the establishment and survival of seedlings and rosettes is enhanced by the reduction of competing cover (Fertig 1994, 1996; Munk 1999). Due to their low stature, rosettes do not appear to be regularly grazed (Fertig 2000b, Mountain West Environmental Services 1985).

Fruit dissemination of the Colorado butterfly plant is poorly understood, although flooding and transport by muddy animals may be important dispersal mechanisms (Fertig 2000b). Long distance dispersal (possibly by muddy waterfowl), may occur frequently enough to account for the relatively homogenous structure across widely spaced populations (Fertig 2000b). It is also plausible that grazing herbivores (including livestock) could also incidentally ingest Colorado butterfly plant seeds and introduce the seeds to unoccupied areas and actually improve the reproductive fitness of any given plant. No other documentation has been found in the literature relative to the topic of livestock acting as a potential seed disperser of Colorado butterfly plants.

The Bureau intends to continue grazing activities and survey (see Hazlett 1999) for the Colorado butterfly plant and if populations are discovered, grazing activities will be managed to maintain Colorado butterfly plant populations (BLM 2005d). The Bureau in the Rawlins Resource Area has committed to conservation measures to protect Colorado butterfly plants (see Appendix I for

a complete list). The use of these conservation measures will reduce or eliminate the effects by ensuring that (1) populations are discovered prior to any surface disturbing activities, (2) excessive surface disturbances do not take place in occupied habitat, (3) invasive plant species infestations are controlled in a manner conducive to the survival of Colorado butterfly plants, (4) the hydrologic regime of the plant's habitat is maintained and studied, and (5) grazing activities are conducted in a manner that will maintain the habitat of the Colorado butterfly plant while minimizing any removal of the plant's flowering parts (BLM 2005d).

Summary of Effects on Colorado Butterfly Plant

Colorado butterfly plant populations in Wyoming are typically found in areas where livestock grazing, mowing, or haying has maintained the habitat in areas where competing vegetation has been removed. However, activities authorized in the livestock grazing program may damage individual plants. The degree to which the plants can sustain damage and not be "adversely affected" is currently unknown but it is suspected that the activities authorized in the livestock grazing program may affect individual Colorado butterfly plant's reproductive success.

The Bureau has made a "may affect, likely to adversely affect determination" for the potential effect that Bureau-authorized livestock grazing activities may have on Colorado butterfly plants that may exist on Bureau-administered surface acreage in the Bureau's Wyoming resource areas based on the potential for browsing or trampling of the flowering and vegetative parts of individual Colorado butterfly plants. Although individual plants may be affected, it is not expected that population-level effects will be realized as a result of Bureau-authorized grazing activities. On the contrary, current livestock grazing practices have not proven detrimental to populations of this plant and may provide beneficial effects to Colorado butterfly plant populations, if they exist within the Rawlins Resource Area (BLM 2005d) and are managed properly.

It is anticipated that livestock grazing actions authorized under the Rawlins RMP could result in negative impacts to the Colorado butterfly plant from harm, destruction, or reduced reproductive success of individual plants. Livestock Grazing Management according to the aforementioned RMP and the Bureau-committed conservation measures (Appendix I) could lead to harm, destruction, or reduced fitness of individual Colorado butterfly plants by trampling, crushing, or grazing of the flowering parts and less frequently, the basal rosettes. However, beneficial effects of grazing, if conducted during appropriate times, are also known to maintain the habitat for the Colorado butterfly plant.

Effects on Colorado Butterfly Plant Critical Habitat

Only Bureau-authorized activities under the Rawlins RMP's Livestock Grazing Management Program were identified as having potential adverse effects to Colorado butterfly plant critical habitat. The potential effects of activities under Livestock Grazing Management on Colorado butterfly plant critical habitat are described here. Potential effects could result from livestock grazing and the resultant soil compaction or streamside degradation that could potentially occur. Livestock grazing could result in the temporary or permanent loss of the primary constituent elements necessary for recovery of the plant.

Analysis for Effects of the Action on Colorado butterfly plant Critical Habitat

Analysis for effects of Livestock Grazing on Critical Habitat. Habitat alterations resulting from agricultural use (grazing) may be beneficial, neutral, and/or detrimental to Colorado butterfly plant critical habitat depending on the intensity, duration, and timing of occurrence (Fertig 2000b). The Colorado butterfly plant's habitat requires disturbance to reset vegetative succession. Also, the Colorado butterfly plant's habitat benefits if the surrounding competing species are removed. Such removal can occur either by flooding, mowing, spraying of herbicides, haying, or grazing.

Excessive livestock use could conceivably cause soil compaction thereby limiting water permeability of the soil. Excessive livestock use could also cause complete and continual removal of all palatable vegetation thereby rendering the habitat unsuitable to persistence of Colorado butterfly plants.

Colorado butterfly plant populations in Wyoming are typically found in areas where livestock grazing, haying, or mowing has maintained the habitat by reducing competing vegetation. However, activities authorized in the Rawlins RMP Livestock Grazing Program may damage areas of critical habitat located on private or state lands in grazing allotments of which the Bureau has discretionary authority over the management of livestock. The degree to which the permitted grazing would adversely affect critical habitat of the Colorado butterfly plant is currently unknown but it is suspected that the activities authorized in the livestock grazing program may affect a small portion of some designated critical habitat of the Colorado butterfly plant.

The Bureau has made a "may affect, likely to adversely affect determination" for the potential effect that Bureau-authorized livestock grazing activities may have on Colorado butterfly plant critical habitat that may exist on lands where the Bureau has some discretionary authority of surface use. Some livestock grazing management practices undertaken by private land owners under the Bureau-issued grazing permits of section 15 parcels could adversely affect designated critical habitat for the Colorado butterfly plant.

It is anticipated that livestock grazing actions authorized under this RMP could result in negative impacts to the Colorado butterfly plant critical habitat from adversely affecting the primary constituent elements of critical habitat. Livestock Grazing Management according to the RMP and the Bureau-committed conservation measures of the BA could lead to soil compaction, or complete vegetative removal of critical habitat for the Colorado butterfly plant.

The extent of these impacts are expected to be managed by the Bureau in the future as they are identified. As the Bureau at times has limited access to private lands where the grazing activities which they permit are located, it will be a challenge for the Bureau to measure the extent of these impacts and to establish the extent of their discretionary authority in these situations.

Summary of Effects on Colorado Butterfly Plant Critical Habitat

It is anticipated that activities associated with livestock grazing as described in the proposed Revision of the Rawlins RMP for the Bureau-administered lands if they were undertaken could adversely affect the Colorado butterfly plant critical habitat. In particular, the Bureau's

permitting of grazing activities on the Section 15 grazing parcels and the preference of the allotment which could extend to the surrounding private land and designated critical habitat of the Colorado butterfly plant could result in soil compaction, excess soil disturbance through trampling, or introduction of noxious weeds. Thus the designated critical habitat of the Colorado butterfly plant may have adversely affected primary constituent elements.

Effects on Ute Ladies'-tresses

The Bureau's Rawlins RMP describes activities in the Livestock Grazing program that may affect and are likely to adversely affect the Ute ladies'-tresses orchid. These effects are (1) the trampling or destruction of the inflorescences (flowering spikes) of individual Ute ladies'-tresses plants by livestock grazing, and (2) any manipulation of the timing or intensity or cessation of grazing of the habitat of this plant. The potential effects of these activities on the Ute ladies'-tresses orchid are described here.

Potential effects could result from direct damage to individual Ute Ladies'-tresses plants from grazing, trampling of the flowering parts of the plant. Loss of habitat could also occur if the Bureau did not permit livestock grazing activities and Ute ladies'-tresses habitat was not maintained in suitable condition.

Trampling of Ute ladies'-tresses flowering spikes may occur as livestock casually move along trails while grazing or moving to water. Conversely, ceasing or over-limiting use of any occupied Ute ladies'-tresses habitat by livestock use or grazing could result in loss of Ute ladies'-tresses habitat since it appears Ute ladies'-tresses requires some maintenance of its habitat by removal of overstory vegetation.

Analysis for Effects of the Action on Ute Ladies'-tresses

Analysis for effects of Livestock Grazing Management on Ute ladies'-tresses. Habitat alterations resulting from agricultural use (grazing) may be beneficial, neutral, and/or detrimental to Ute ladies'-tresses orchid depending on when it occurs (McClaren and Sundt 1992, USFWS 1995a). The Ute ladies'-tresses orchid is edible to livestock and depressed inflorescence (flowering spike) and fruit production has been observed at sites that are grazed in late summer (Arft 1995). However, at least two populations in Idaho and Colorado have been grazed for over 50 years but still support large populations of Ute ladies'-tresses (Arft 1995). This indicates that the population is still capable of reproduction in the presence of long-term grazing, but may experience short-term impacts.

Grazing is the primary land use found at Ute ladies'-tresses populations in Wyoming (Fertig (2000a). Livestock management activities have variable effects on Ute ladies'-tresses. Grazing livestock could reduce competition with other grasses and forbs thereby allowing Ute ladies'-tresses to take advantage of sunlight, water, and nutrients that might otherwise be deprived of the plant. Although, occasional trampling may damage leaves or flowers of individual Ute ladies'-tresses, it is assumed that the plant grows back if its roots are not damaged (BLM 2005e).

In a 4-year study of a separate species of ladies'-tresses orchid (*S. spiralis*) in Great Britain, Wells (1967) discussed damage done by herbivores to that species (autumn ladies'-tresses). Wells (1967) found that herbivores did very little damage to the leaves of that species even under years of heavy grazing by sheep. Damage to the leaves was observed only twice during that

4-year study, in which 1,639 autumn ladies'-tresses plants were examined. On two occasions, only one leaf of a rosette was affected, the damage taking the form of a translucent browning of the leaf lamina. There was no evidence of physical damage from grazing and the cause of the browning remained unknown. Wells (1967) speculated that this unusually small amount of damage to the basal rosette leaves indicated how well-adapted that ladies'-tresses orchid is to an open habitat in which the turf is kept short by grazing animals.

In contrast, according to Wells (1967) damage to the flowering spike of some of those plants was observed in every year of the 4-year study and took several forms. Damage thought to be caused by sheep grazing was characterized by the upper part of the spike missing and the jagged end of the spike remaining. A second type of damage to the flowering spike reported was trampling by cattle. Trampling damage caused by cattle was noticed during the final year of the study after cattle had grazed the study area during the orchid's flowering period. On those plants affected by trampling, flowering spikes were broken near the base of the plant, but Wells (1967) found that in most of the plants affected the spikes were not completely severed from the plant.

According to Wells (1967), the number of plants with damage to the flowering spike varied in each year according to the type and intensity of grazing during the period of flowering. In contrast, Wells (1967) reports that when sheep were removed in early June, less than 1 percent of the flowering spikes were recorded as damaged that year.

Wells (1967) reports, that in another year of his study, the area was heavily grazed by sheep at a density of about four per acre during the summer months and in the late autumn. As a result of this, 30 percent of the flowering spikes were damaged, but 70 percent escaped damage even at that high intensity of grazing. In the final year of the study, 10 to 20 head of cattle grazed the area with the result that 22 percent of the flowering spikes were damaged, mainly by trampling.

It can be presumed that similar damage could occur to Ute ladies'-tresses as it was recorded to occur to the autumn ladies'-tresses in Great Britain. The Bureau office in Rawlins does permit sheep and cattle grazing on the surface lands which they administer. Therefore, the livestock grazing program administered by the Bureau may influence the reproductive potential of any given Ute ladies'-tresses plant. It is interesting to note that even under heavy grazing, Wells (1967) documented that 70 percent of the flowering stalks escaped any damage. Seed number is not thought to be limiting to populations of *S. diluvialis* as flowering spikes have the potential to produce 5 to 30 fruits per flowering spike and each fruit can contain between 100 to 10,000 seeds (Sipes and Tepedino 1994). Therefore, even under heavy grazing pressure as described by Wells (1967), even a small population of *S. diluvialis* has the potential to produce tens of thousands of seeds.

Arft (1994) studied the effects of cattle grazing on Ute ladies'-tresses orchids along Clear Creek in Colorado and Deer Creek in southern Utah. Individual plants were monitored on a monthly basis from May to September. Data indicated that (1) the proportion of flowering individuals varied each year, (2) herbivory may prevent a large number of orchids from reproducing, and (3) it remained unclear whether past management practices such as grazing and mowing were beneficial or detrimental to sexual reproduction in *S. diluvialis*. The data suggested that the large fluctuations in population size reported in monitoring counts may actually be fluctuations in number of flowering individuals, with many individual plants remaining vegetative (non-flowering) or subterranean. During Arft's (1994) study, the proportion of flowering individuals

increased from 58 percent in the first year to 80 percent in the second year of the study within the control plots, indicating flowering plants alone may not be a good indicator of population size.

It is plausible that livestock could also incidentally ingest Ute Ladies'-tresses seed heads and act as seed dispersal mechanisms to introduce the seeds to unoccupied areas and actually improve the reproductive fitness of any given plant although Wells (1967) did not mention any such documented occurrences in his study of the autumn ladies'-tresses. He in fact stated that most of the damage done by cattle in his study was due to trampling and treading on the flowering spikes. No other documentation has been found in the literature relative to the topic of livestock acting as a potential seed disperser of Ute ladies' tresses orchids. This is one area where more research may be needed.

It is currently accepted that grazing activities generally benefit the habitat necessary for Ute ladies'-tresses populations if these activities are timed to occur up to one month prior to flowering. Fencing, changes in livestock seasons of use or type of livestock, and riparian improvement projects may be used to protect the flowering spikes of individual plants from crushing or removal.

The Bureau intends to continue grazing activities and surveys for Ute ladies'-tresses and if populations are discovered, grazing activities will be managed to maintain Ute ladies'-tresses populations (BLM 2005e). The Bureau in Rawlins has committed to conservation measures to protect Ute ladies'-tresses (see Appendix I for a complete list). The use of these conservation measures will reduce or eliminate the effects by ensuring that (1) populations are discovered prior to any surface disturbing activities, (2) surface disturbances do not take place in occupied habitat, (3) invasive plant species infestations are controlled in a manner conducive to the survival of Ute ladies'-tresses, (4) the hydrologic regime of the plant's habitat is maintained and studied, and (5) grazing activities are conducted in a manner that will maintain the habitat of the species while minimizing any removal of the plant's flowering spikes (BLM 2005e).

Summary of Effects on Ute Ladies'-tresses

Ute ladies'-tresses populations in Wyoming are typically found in areas where livestock grazing has maintained the habitat in areas where competing vegetation has been removed and there is a fair amount of bare ground surface (Fertig 2004) characteristic of an area that has been partially grazed regularly. However, activities authorized in the livestock grazing program may damage individual plants. The degree to which the plants can sustain damage and not be "adversely affected" is currently unknown but it is suspected that the activities authorized in the livestock grazing program may affect individual Ute ladies'-tresses orchid's reproductive success.

The Bureau has made a "may affect, likely to adversely affect determination" for the potential effect that Bureau-authorized livestock grazing activities may have on Ute ladies'-tresses that may exist on Bureau-administered surface acreage in the Rawlins Resource Area based on the potential for browsing or trampling, or mowing of the flowering spikes of individual Ute ladies'-tresses plants. However, current livestock grazing practices have not proven detrimental to populations of this plant and may provide beneficial effects to Ute Ladies'-tresses populations, if they exist within the Rawlins Resource Area (BLM 2005e) and are managed properly.

It is anticipated that livestock grazing actions authorized under this RMP could result in negative impacts to the Ute ladies'-tresses from harm or destruction of individual plants. Livestock

Grazing Management according to the RMP and the Bureau-committed conservation measures of the BA could lead to harm, destruction, or reduced fitness of individual Ute ladies'-tresses plants by trampling, crushing, or grazing of the flowering spikes. However, beneficial effects of grazing, if conducted during appropriate times, are also known to maintain the habitat for this species. Any complete cessation of livestock grazing could also lead to increased growth of overstory plants and loss of habitat for Ute ladies'-tresses.

Effects on the Blowout Penstemon

The Bureau has described activities in the Livestock Grazing Management program that are likely to adversely affect the blowout penstemon over the life of the Rawlins RMP. These effects are the trampling or destruction of individual blowout penstemon plants due to foraging activities by livestock. The potential effects of these activities on the blowout penstemon are described here.

Analysis for Effects of the Action on Blowout Penstemon

Livestock grazing is the primary land use found at blowout penstemon populations in Wyoming (BLM 2005c). Livestock management activities may have variable effects on blowout penstemon plants (BLM 2005c, Heidel 2005c, USFWS 1992a). The three known blowout penstemon populations occur within two grazing allotments of the Bureau's Divide Grazing Environmental Impact Statement (EIS) Area of the Rawlins Resource Area. This EIS was completed prior to the discovery of blowout penstemon in Wyoming. Cattle currently graze both allotments, but up until 2002, the allotment that included the Bradley Peak populations was grazed by sheep (Heidel 2005c).

Blowout penstemon is edible to cattle and horses, but is not their preferred forage if other vegetation is available (USFWS 1992a). It was found that in Nebraska during grazing seasons of normal precipitation levels, grazing of blowout penstemon by cattle was minor and confined mostly to occasional shoots of the plant. This type of grazing could have beneficial effects because it breaks apical dominance (USFWS 1992a). It was also observed that at other times in Nebraska, when other forage was severely limited because of drought conditions, severe grazing damage occurred with the entire above-ground portion of the blowout penstemon plants removed by grazing animals.

Observations by research personnel performing blowout penstemon surveys have shown that livestock grazing of blowout penstemon plants is very limited in Wyoming (Heidel 2005c). In Wyoming, livestock are distributed across large allotments and the blowout penstemon plants primarily occupy the rim or sides of very steep sandy slopes. Livestock grazing of blowout penstemon in Wyoming is more likely to occur where relatively few plants are located; at the bases of sand dunes adjacent to water sources such as ponds, spring seeps, and wetlands (Heidel 2005c). For the same reasons, livestock trampling damage in Wyoming is usually not significant because of the plant's sparse distribution and shifting substrate, although livestock could potentially step on and crush a few individual plants or consume them along with other plant species (BLM 2005c). Though individual blowout penstemon plants may be damaged, and the fitness of the plants may be affected for the season, the plants usually recover and the overall population is minimally affected. Some herbivory has been noted on blowout penstemon plants in Wyoming since surveys were initiated in 2000. Wild ungulate tracks such as elk, deer, and antelope are abundant within the plants habitat, whereas the tracks of cattle are seen infrequently

(Heidel 2005b). Furthermore, herbivory was noted in 2004 from antelope as indicated by the presence of the animals themselves and their tracks in the sand, prior to cattle being released on the allotment. At the Pathfinder blowout penstemon population in Wyoming in 2004, 26 of the 29 plants (almost 90 percent) observed there were browsed by wild ungulates. It is uncertain whether prolonged browsing can indefinitely favor vegetative sprouting, or ultimately curb reproductive output levels (Heidel 2005c).

Livestock currently permitted on grazing allotments within blowout penstemon habitat in Wyoming are not excluded from blowout penstemon plants with fences or other means. Therefore, livestock do have access to the plants. Fencing of blowout penstemon habitat, if undertaken, would be very difficult due to the shifting nature of the sand dunes that comprise the plant's habitat. It would be impractical to try to build and maintain a fence on a sand substrate because sand would blow over or out from under the fence, either covering it up or suspending it in mid air. For this reason, it has been determined that fencing of blowout penstemon habitat would be an impracticable management tool.

It is plausible that grazing ungulates could ingest blowout penstemon seeds and act as seed dispersal mechanisms to introduce the seeds to unoccupied areas and actually improve the reproductive fitness of any given plant. Although some authors have speculated about the actions of animals acting as seed dispersers of blowout populations (Heidel 2005c, USFWS 1992a), no documentation has been found in the literature with evidence supporting this theory. Although not known to have occurred in blowout penstemon habit in Wyoming, grazing ungulates (including livestock) could also potentially introduce the seeds of noxious weeds or other invasive plant species to blowout penstemon habitats.

The Bureau intends to continue current grazing activities but will implement a host of conservation measures designed to minimize impacts to the plants (see Appendix I). If more blowout populations are discovered as a result of on-going Bureau-authorized surveys, then grazing activities will be managed to maintain those blowout penstemon populations as well (BLM 2005c). The use of the conservation measures committed to by the Bureau will reduce or eliminate many of the effects from livestock grazing to the plants. The Bureau has committed to (1) implementing surveys in the habitat for this species prior to authorization of any surface disturbance activities to ensure that the plant and its habitat will be protected from disturbing activities, (2) restoring, maintaining, or improving plant communities in grazing allotments to assist in the recovery of the species, (3) placing mineral supplements, or new water sources (permanent or temporary), for livestock, wild horses, or wildlife at least 1.0 mile from known blowout penstemon populations to move the concentrations of these animals away from the plants which should reduce trampling and incidental grazing of the plants, (4) ensuring that straw or livestock feed must be certified weed-free to minimize the possibility that noxious weeds will be introduced into the blowout penstemon habitat, (5) prohibiting biological control of noxious plant species in blowout penstemon habitat until the impact of the control agent has been fully evaluated and determined not to adversely affect the plant, (6) prohibiting herbicide treatment of noxious plants/weeds within 0.25 mile of known blowout penstemon populations and insecticide/pesticide treatments within 1.0 mile of known blowout penstemon populations to protect pollinators, except in cases of extreme ecological health (insect or weed outbreaks/ infestations) in which case herbicides will be applied by hand on a case-by-case basis with care taken not to spray blowout penstemon plants, (7) carefully planning aerial application of herbicides to prevent drift in areas near known blowout penstemon populations (outside of the 0.25 mile buffer) to minimize the potential that the plants will be inadvertently sprayed with

herbicide, (8) using only native species in revegetation projects conducted within 0.25 miles of known blowout penstemon habitat to minimize potential effects of competition with non-native species, (9) not authorizing revegetation projects in known or potential blowout penstemon habitats to ensure that the habitat continues to be susceptible to wind erosion which is favorable for this species, (10) limiting the use of off-highway vehicles (OHVs) to designated roads and trails within 1.0 mile of known blowout penstemon populations, with no exceptions for the "performance of necessary tasks" other than fire fighting and hazardous material cleanup allowed using vehicles off of highways, to minimize the potential that ORVs will crush or uproot the plants, (11) reclaiming existing roads near blowout penstemon populations to minimize human traffic to the area which could lead to introduction of noxious weeds or other disturbances to the plants, and (12) designing and selecting project locations to minimize disturbances to known blowout penstemon populations (See Appendix I).

Summary of Effects on Blowout Penstemon

Blowout penstemon populations were recently discovered in Wyoming. The three Wyoming populations are at least partially located on Bureau-managed lands. These populations are found in remotely-located, shifting sand dune habitats. In the past, these areas have typically not received a great deal of use. The management of these areas, accordingly, also has not been intensive in the past. To minimize or eliminate potential adverse effects to the blowout penstemon in Wyoming, the Bureau has committed to the implementation of a number of conservation measures (see Appendix I).

The Bureau has made a "may affect, likely to adversely affect determination" for the potential effect that Bureau-authorized livestock grazing activities may have on blowout penstemon plants in the Rawlins Resource Area. This determination is based on the potential for grazing or trampling by livestock to reduce reproductive potential and vigor of individual blowout penstemon plants. However, livestock grazing could also benefit this species. Conservation measures to be implemented by the Bureau will minimize the impacts of Bureau activities to the blowout penstemon.

Minimization of Effects to the Species'

To minimize the effects to listed species, the Bureau will implement the conservation measures listed in Appendix I. For all listed species, the Bureau will ensure that surveys are conducted in suitable habitat prior to implementation of potentially disturbing project activities. The Bureau's implementation of the conservation measures of Appendix I will reduce human and project disturbance to (1) nests and roosts for the bald eagle, (2) riparian areas for the protection of individuals and habitat for Preble's, the Colorado butterfly plant, and Ute ladies'-tresses, and (3) occupied sand dunes for the protection of blowout penstemon plants and their habitat. The Bureau's implementation of the conservation measures will also minimize the potential for inadvertent spraying of herbicides or introduction of noxious weeds into the habitats of federally listed plants of the Rawlins Resource Area. The Bureau's application and enforcement of buffer restrictions for spraying of insecticides near listed plants will help ensure that populations of necessary insect pollinators of listed plants will be maintained.

CUMULATIVE EFFECTS

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

Of the roughly 11.2 million acres within the Rawlins Resource Area, 3.5 million surface acres are managed by the Bureau with most available to livestock operations. The Bureau in Rawlins also oversees the use of approximately 5.6 million subsurface acres within the resource area. The exact cumulative effects of many of these species are not known at this time due to a lack of specific information on future, state, local, or private actions in the Rawlins Resource Area over the life of the RMP.

Bald Eagle

Since most impacts to the bald eagle and its habitat are human-related (e.g., recreational use), or the result of human activities (e.g., livestock grazing, mineral development, housing development), and the human pressures in the Rawlins Resource Area in Wyoming are likely to increase over the foreseeable future, the scope and scale of the impacts are likely to increase. Specifically, industrial development on state, local, or private property is likely to increase (e.g., Atlantic Rim, Creston/Blue Gap, Continental Divide-Creston, etc.) followed by an increase in associated impacts to bald eagles and their habitats. Expected well density, access road density, and infrastructure development for oil and gas development is expected to increase significantly across large areas private, or State-owned lands of the resource area. This increase in oil and gas activity could lead to (1) bald eagle nest or roost abandonment causing impaired or lost reproductive capacity or mortality or young, (2) habitat change resulting in a decrease in the ability of eagles to find suitable breeding, shelter, or foraging areas or adequate prey base, or (3) physical harm or death to bald eagles.

Preble's and Critical Habitat, Colorado Butterfly Plant and Critical Habitat, Ute ladies'-tresses

Most impacts to Preble's and its critical habitat, Colorado butterfly plant and critical habitat, and Ute ladies'-tresses are human-related (e.g., recreational use), or the result of human activities (e.g., livestock grazing, mineral development, housing development), and the human pressures in the planning area are not expected to significantly increase in the foreseeable future, any cumulative effects to Preble's from cumulative effects on the Bureau-administered lands are expected to be insignificant.

Impacts to Preble's and its critical habitat, the Colorado butterfly plant and the Ute ladies'-tresses could result from livestock operations on private lands in the Rawlins Resource Area. These impacts could be beneficial (maintaining habitat through grazing or haying), or detrimental (limiting individual plant reproductive fitness by removal of fruiting parts through trampling or ingestion). The nature of the impacts from livestock operations is likely to be fairly similar across land ownerships (BLM 2005d).

Mowing and haying on private and state lands could be beneficial to Colorado butterfly plant and Ute ladies'-tresses populations. However, these activities could also be detrimental if done before fruits have ripened. Late season mowing (after the fruit have ripened) may be one of the

best management tools available for maintaining the habitat of this subspecies. In many current management situations, the timing of mowing is related to growth conditions of the hay crop and weather patterns rather than the biological needs of the Colorado butterfly plant. Mowing has little impact on the leaves of the rosettes and probably does not result in population declines (Fertig 2000b).

Other potential effects from non-federal actions in the planning area could include increases in urbanization (although this is not thought to be a significant impact in the planning area at this time), and increased oil, gas, or mineral extraction on private lands. In particular, if coalbed methane development on private lands in the area occurred in occupied Preble's, Colorado butterfly plant, and Ute ladies'-tresses habitat, it could alter riparian stream channel functions. Dewatering of aquifers in preparation for methane extraction and the combined discharge of such waters into surface streams could cause significant changes to stream hydrology and chemical properties thereby potentially impacting any extant Colorado butterfly plant populations occurring in those drainages.

Blowout Penstemon

Only three populations of blowout penstemon are known to occur in Wyoming. All of these are contained wholly or partially on Bureau-administered lands. If other populations do occur in Wyoming on lands that are not federally owned, it is presumed that these populations would be susceptible to the same effects of livestock grazing as the three known populations. The nature of the impacts from livestock grazing are likely to be similar across all land ownership types. No other significant effects to the blowout penstemon in Wyoming are currently known to be occurring.

CONCLUSION

After reviewing the current status of the bald eagle, the Preble's and its critical habitat, the Colorado butterfly plant and its critical habitat, the Ute ladies'-tresses orchid, and the blowout penstemon; the environmental baseline for the action area; the effects of the Rawlins Resource Management Plan; and the cumulative effects, it is the Service biological opinion that the direct and indirect effects of the implementation of the Rawlins Resource Management Plan, as proposed, are not likely to jeopardize the continued existence of the bald eagle, the Preble's, the Colorado butterfly plant, the Ute ladies'-tresses orchid, the blowout penstemon, or adversely modify the critical habitat of the Preble's or the Colorado butterfly plant. No critical habitat has been designated for the bald eagle, the Ute ladies'-tresses, or the blowout penstemon; therefore, none will be affected.

The Service has reached this conclusion by considering the following.

Bald Eagle

1. Bald eagles are widely distributed throughout their breeding range, with the bald eagle population in the lower 48 states estimated at 5,748 breeding pairs in 1999 (USFWS 1999c). Bald eagle recovery objectives in Wyoming have been exceeded since 1987 and the population has continued to increase. Bald eagle surveys in Wyoming in 2004 attained adequate production data for 105 nesting territories, with 95 pairs producing

young. In 1978, only 20 bald eagle nesting locations were known statewide. However, there are now over 140 bald eagle nesting locations in Wyoming (Bob Oakleaf, personal communication). Where Bureau-authorized activities are expected to result in the loss of a nest or individuals, this loss of relatively few individuals or nests would be a relatively minor impact on the population in the contiguous United States as a whole.

2. The Service believes that the take of bald eagles, resulting from this plan, is tied to disturbance, mortality, or reduced reproductive capacity of individual eagles or habitat modification that will result in harm or harassment, or decrease in the fitness of bald eagles. Any actions implemented under the RMP that may adversely affect the bald eagle would require separate formal section 7 consultation at the project level. At the project level, there will be an analysis of effects and measures will be implemented to minimize adverse effects, as appropriate, for each particular project.

3. The Service does not expect that bald eagle habitat connectivity or population genetics would be substantially altered by the result of Bureau-authorized activities in the Rawlins Resource Area analyzed in this consultation.

Preble's and Critical Habitat

4. Preble's are located in a larger geographic area than the planning area. Threats from residential development have been severe in localized areas (i.e. Denver, Colorado). However, Preble's are persisting in numerous locations in Colorado and Wyoming. Many occurrences of Preble's are known throughout its range. For example, based on a compilation of surveys in Wyoming and in Colorado, from 1996 to 2005, *Zapus* species, assumed to be Preble's, are known to occur in 40 separate riparian areas.

5. Past disturbances to Preble's habitat from issuance of rights-of-way (ROWs) permitted by other agencies have resulted in a very small portion (0.1 to 5.0 acres) of habitat disturbance per project. Furthermore the majority of this habitat disturbance is considered temporary habitat disturbance. The areas have typically been revegetated following project completion. The exact number of acres of Preble's habitat within the action area has not been quantified at this time. However, the three designated critical habitat units which cross the action area are a much smaller subset of the actual habitat available to Preble's across its range. These three critical habitat units (North Platte 1 Unit, North Platte 3 Unit, and South Platte 1 Unit) collectively contain 10,542 acres of Preble's habitat (USFWS 2003b).

6. The Bureau has committed to conservation measures which will reduce the impacts of reservoir development and ROW authorization and leasing to Preble's or its habitat.

7. The extent of Bureau activities (e.g. ROW issuance, reservoir construction) which may adversely affect Preble's or its critical habitat is expected to be limited (occur over a small area), monitored, and highly-controlled to the full extent of the Bureau's authorization capabilities in accordance with Bureau policies and committed conservation measures. The Service believes that the take, resulting from this plan, is tied to the use of heavy equipment, vehicle use, road construction, or water development construction which may result in harm, harassment, or death of Preble's or adverse effects to the primary constituent elements of its designated critical habitat. Any actions implemented

under the RMP that may adversely affect Preble's or its critical habitat would require separate formal section 7 consultation at the project level. At the project level, there will be an analysis of effects and measures will be implemented to minimize adverse effects, as appropriate, for each particular project.

Colorado Butterfly Plant and Critical Habitat

8. It appears that this species is more widespread and numerous than was previously known. When this taxon was originally designated as a candidate for listing, it was known from only three small populations. Surveys in 1984-186 and 1992-93 resulted in the discovery or relocation of 22 populations, many of which are reasonably large. More importantly, studies have indicated that this species may be less threatened by certain agricultural practices than originally suspected. In particular, populations may continue to thrive in winter-grazed or rotationally grazed pastures and can persist in hayed meadows, especially if haying is delayed until after the plants fruiting period (Marriott 1987; Fertig 1994, 1996).

9. The Bureau has no known populations of this species under its direct management as no populations are currently known to exist on Bureau-administered surface lands or Bureau-administered subsurface.

10. The Bureau is not proposing to implement any significant changes to the management of any Colorado butterfly plant potential habitat that may cause detrimental impacts to any populations.

11. The Bureau is committed to implementing protective measures (see Appendix I) to minimize potential impacts to Colorado butterfly plant and its designated critical habitat if these plants or critical habitat are located on lands over which the Bureau has some discretionary authority through the approval of allotment management plans for "section 15 parcels".

12. Finally, although individuals can be adversely impacted by livestock grazing activities (trampling, ingestion, etc.) and livestock may cause some degree of soil disturbance or compaction, the population seems to withstand some grazing pressure and may actually rely on these activities for maintenance of their habitat.

13. The Service believes that the take, resulting from the Rawlins Resource Management Plan, is tied to the use of livestock grazing which may result in harm, or death of Colorado butterfly plants or erode or compact the soil of some portions of their designated critical habitat. Any actions implemented under the RMP that may adversely affect Colorado butterfly plant or its critical habitat would require separate formal section 7 consultation at the project level. At the project level, there will be an analysis of effects and measures will be implemented to minimize adverse effects, as appropriate, for each particular project.

Ute Ladies'-tresses

14. It appears that this species is more widespread and numerous than was previously known. At the time of listing, the total known Ute ladies'-tresses population numbered approximately 6,000 individuals. Extensive census efforts between 1991-1995 revealed that known population size was approximately 20,500 individuals. Since 1995, several new populations have been located adjacent to the action area, one of which contained several thousand individuals. Between 1992-1999, the total known population of the Ute ladies'-tresses orchid observed across its range reached over 60,000 individuals (USFWS 2004f). It is expected that new populations will continue to be discovered as not all potential habitat has been surveyed. As a response to the plant's more widespread distribution, the Service has undertaken a 5-year status review and has begun preparing a 12 month finding on a petition to delist the species (USFWS 2004b).

15. The Bureau is not proposing to implement any significant changes to the management of any Ute ladies'-tresses potential habitat that may cause detrimental impacts to any populations.

16. The Bureau is committed to implementing protective measures (see Appendix I) to minimize potential impacts to Ute ladies'-tresses.

17. Although individuals can be adversely impacted by livestock grazing activities (trampling, ingestion, etc.), the population seems to withstand some grazing pressure and may actually rely on these activities for maintenance of their habitat.

Blowout Penstemon

18. It appears that this species is more widespread and numerous than was previously known. At the time of listing, the blowout penstemon was not known to occur in Wyoming. The blowout penstemon was considered endemic to Nebraska at the time of listing and the total known blowout penstemon population numbered approximately 2,100 individuals. Extensive census efforts since the plant was discovered in Wyoming as well as the establishment of transplanted blowout penstemon plants at new sites in Nebraska has increased the total population size of blowout penstemon plants to be an estimated 17,550 plants rangewide in 2004. It is expected that new populations will continue to be discovered in Wyoming as not all potential habitat has been surveyed.

19. The Bureau is not proposing to implement any significant changes to the management of any blowout penstemon potential habitat that may cause detrimental impacts to any populations.

20. The Bureau is committed to implementing protective measures (see Appendix I) to minimize potential impacts to blowout penstemon.

21. Finally, although some individuals are likely to be adversely impacted by livestock grazing activities (trampling, ingestion, etc.), blowout penstemon plants in Wyoming normally occupy steep shifting sand dunes which are not regularly grazed by livestock but have been grazed at least temporarily by native ungulates.

ACTIONS AFFECTING PLATTE AND COLORADO RIVER FLOWS

The Platte River and Colorado River Recovery Programs provide a programmatic, streamlined, process for section 7 consultation under the Act to expedite section 7 compliance on water projects in these river basins, respectively. Participation in these recovery programs provides section 7 compliance for the vast majority of new and existing water projects in these basins. Depletion consultations under section 7 are tiered to previously issued Biological Opinions, facilitating the streamlined consultation process for all such future depletion consultations.

Platte River Depletions

Since 1978, the 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, and are likely to adversely affect, one or more federally-listed threatened or endangered species and their critical habitat. Currently, it is recognized that federal agency actions resulting in water depletions to the Platte River System are likely to adversely affect the whooping crane (*Grus americana*) and designated critical habitat, interior least tern (*Sterna antillarum*), piping plover (*Charadrius melodus*) and designated critical habitat, pallid sturgeon (*Scaphirhynchus albus*), bald eagle (*Haliaeetus leucocephalus*), and western prairie fringed orchid (*Platanthera praeclara*).

While the proposed Rawlins RMP does not authorize site-specific or project-level actions, leading to depletions in the Platte River Basin, it identifies 21 historic projects that result in minor depletions [<25 acre-feet (a-f)] to the Platte River (Table 3 of BLM 2006). Future maintenance of these projects will require formal section 7 consultation for effects of depletions to downstream federally listed species of the Platte River and their designated critical habitat.

The Rawlins RMP also identifies several potential new projects that would result in *minor* depletions (#25 a-f) to the Platte River (Table 4 of BLM 2006), including: water development (including channel restoration)(0.29 a-f/project); wildland fire suppression (including prescribed burning, constructing fire lines, using chemical fire suppression agents, and the use of fire retardant drops)(0.31 a-f); gas drilling activities (0.41 a-f/well) and lands and realty actions (including ditch, right-of-way, and small reservoir approval)(10 a-f/project). The proposed Rawlins RMP does not authorize these projects. Implementation of these projects, or any other projects leading to depletions to the Platte River, will require individual or separate section 7 consultation for effects of depletions to downstream federally listed species of the Platte River and their designated critical habitat.

Colorado River Depletions

Formal consultation is required for projects that may lead to depletions of water to the Colorado River system. A Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin (Recovery Program) was initiated on January 22, 1988. The Recovery Program was intended to be the reasonable and prudent alternative to avoid jeopardy to the endangered fish by depletions from the Upper Colorado River.

Federal agency actions resulting in water depletions to the Colorado River system may affect the Bonytail (*Gila elegans*), Colorado pikeminnow (*Ptychocheilus lucius*), Humpback chub (*Gila*

cypha), Razorback sucker (*Xyrauchen texanus*) and their designated critical habitat downstream in the Colorado River system. While the proposed Rawlins RMP does not authorize site-specific or project-level actions leading to depletions in the Colorado River Basin, it identifies 48 existing projects that result in *minor* depletions (<100 a-f) to the Colorado River Basin (Table 3 of BLM 2006). Future maintenance or expansion of these projects will require section 7 consultation for effects of depletions to downstream federally listed fishes of the Colorado River and their designated critical habitat.

The Rawlins RMP Revision also identifies several potential new projects that would result in *minor* depletions (#100 a-f) to the Colorado River (Table 4 of BLM 2006), including: water development (including channel restoration) (2.96 a-f/project); wildland fire suppression (including prescribed burning, constructing fire lines, using chemical fire suppression agents, and the use of fire retardant drops) (0.31 a-f); gas drilling activities (0.65 a-f/well), and lands and realty actions (including ditch, right-of-way, and small reservoir approval)(10 a-f/project). The proposed Rawlins RMP does not authorize these projects. Implementation of these projects, or any other projects leading to depletions to the Colorado River, will require individual or separate section 7 consultation for effects of depletions to downstream federally listed fishes and their designated critical habitat.

INCIDENTAL TAKE STATEMENT

Section 4(d) and 9 of the Act, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or the applicant. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Bureau so that they become binding conditions of any grant or permit issued, as appropriate, for the exemption in section 7(o)(2) to apply. The Bureau has a continuing duty to regulate the activity covered by this Incidental Take Statement. If the Bureau (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the Incidental Take Statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of the incidental take, the Bureau must report the progress of the action and its impact on the species to the Service as specified in the Incidental Take Statement. [50 CFR 402.14(i)(3)]

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the Act prohibits the removal and reduction to possession of Federally listed plants or the malicious damage of such plants on areas under Federal jurisdiction, or the destruction of endangered plants on non-Federal areas in violation of State law or regulation or in the course of any violation of a State criminal trespass law.

AMOUNT OR EXTENT OF TAKE

The Service anticipates that bald eagles and/or Preble's could be taken as a result of this proposed action. The incidental take is expected to be in the form of harm, harassment, or death of individuals. Incidental take has been determined based on the Rawlins RMP and an analysis of the environmental baseline, effects of the action, and the cumulative effects. At the broad scale of this consultation, the Service is unable to anticipate all possible circumstances that may involve the take of bald eagles and/or Preble's due to the actions implemented under the RMP revision. Therefore, the Service conservatively anticipates that some level of incidental take may occur due to specific actions implemented under the Rawlins RMP. However, the amount or extent of take is unquantifiable at this time. The Service believes that the take, resulting from this plan, is tied to habitat modification or disturbance of individual bald eagles and/or Preble's that will result in harm, harassment, or death of individuals. Any actions implemented under the Rawlins RMP that may affect and are likely to adversely affect bald eagles and/or Preble's would require separate formal section 7 consultation at the project level. Those project level consultations would be tiered to the Rawlins RMP BO. Incidental take will appropriately be

assessed, and coverage under the terms of Section 7(b)(4) and Section 7(o)(2) of the Act will be granted as appropriate, at the project level during formal consultation.

EFFECT OF THE TAKE

In this Biological Opinion, the Service has determined that this level of anticipated take is not likely to result in jeopardy to the bald eagle and/or Preble's or destruction or adverse modification of the Preble's designated critical habitat. No critical habitat for the bald eagle has been designated; therefore none will be destroyed or adversely modified.

REASONABLE AND PRUDENT MEASURES

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take:

RPM1. The Bureau shall implement measures at the individual project level across the Rawlins Resource Area to eliminate or minimize potential adverse effects to bald eagles, Preble's, and Preble's designated critical habitat.

RPM2. The Bureau shall ensure direct Preble's habitat disturbance does not exceed that evaluated in this Biological Opinion. Through minimization and monitoring of direct habitat disturbance, indirect disturbances to the species will be minimized.

RPM3. The Bureau shall implement measures across the Rawlins Resource Area to improve habitat conditions for bald eagles and Preble's.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of Section 9 of the Act, the Bureau must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are nondiscretionary.

<u>Bald Eagle and Preble's</u>

T&C1. The Bureau in the Rawlins Resource Area will implement all conservation measures as committed to in the Bureau's Rawlins RMP Biological Assessment (BLM 2006) and the Bureau's Statewide Programmatic Species-Specific (Bald Eagle and Preble's) Biological Assessments and identified as part of the proposed action (see Appendix I).

T&C2. As per Section 7 of the Act, the Bureau will conduct site specific consultation with the Service prior to authorization of any actions described in the revised Rawlins RMP which "may affect" listed species. These future consultations will provide a means for site specific analysis and documentation of levels of "take" of listed species.

T&C3. To monitor the impacts of site-specific projects authorized under the Bureau's Rawlins RMP, that are likely to adversely affect Bald Eagles and/or Preble's, the Bureau shall prepare a report describing the progress of each such site-specific project, including implementation of the associated reasonable and prudent measures, and impacts to these species (50 CFR §402.14[i][3]).

The reasonable and prudent measures, with their implementing terms and conditions and the reporting criteria, are designed to minimize the impact of incidental take that might otherwise result from the authorized activities under the RMP. If, during the course of the authorized activities, any level of incidental take has exceeded that as permitted by site-specific formal consultations for bald eagles and/or Preble's, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Bureau must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations (CR) are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's section 7(a)(1) responsibility for these species.

Bald Eagle

CR1. The Service recommends that the Bureau follow all best management practices as identified in the Bureau's Rawlins RMP Biological Assessment (BLM 2006) and the Bureau's Statewide Programmatic Bald Eagle Biological Assessment (BLM 2003).

Preble's

CR2. The Service recommends that the Bureau follow all best management practices as identified in the Bureau's Rawlins RMP Biological Assessment (BLM 2006).

CR3. The Service recommends that the Bureau continue to implement standard operating procedures to insure non-native and noxious weeds do not become re-established within suitable habitat for Preble's.

CR4. The Service recommends that the Bureau continue to develop threatened and endangered species information and share it with all levels of personnel. The Service recommends the goal of this information be aimed at providing education and public outreach regarding threatened and endangered species in Wyoming.

CR5. The Service recommends that the Bureau maintain and restore the dynamics of stream systems, both within and upstream from Preble's habitat.

Colorado Butterfly Plant

CR6. The Service recommends that the Bureau follow all best management practices as identified in the Bureau's Rawlins RMP Biological Assessment (BLM 2006) and the Bureau's Statewide Programmatic Colorado Butterfly Plant Biological Assessment (BLM 2005d).

Ute Ladies'-tresses

CR7. The Service recommends that the Bureau follow all best management practices as identified in the Bureau's Rawlins RMP Biological Assessment (BLM 2006) and the Bureau's Statewide Programmatic Ute ladies'-tresses Biological Assessment (BLM 2005e).

CR8. In known occupied Ute ladies'-tresses habitat, the Service recommends that the Bureau use management actions that are compatible with protection and conservation of pollinators of the Ute ladies'-tresses orchid.

CR9. The Service recommends that the Bureau monitor and manage invasive species so these do not impact the Ute ladies'-tresses orchid or its habitat.

CR10. The Service recommends that the Bureau not authorize herbicide use in known or occupied Ute ladies'-tresses habitat without prior review by Service biologists.

Blowout Penstemon

CR11. The Service recommends that the Bureau follow all best management practices as identified in the Bureau's Rawlins RMP Biological Assessment (BLM 2006) and the Bureau's Statewide Programmatic Blowout Penstemon Biological Assessment (BLM 2005c).

CR12. The Service recommends that the Bureau monitor OHV activity near blowout penstemon sites.

CR13. The Service recommends that the Bureau post signs near blowout penstemon sites informing the public of OHV use restrictions.

CR14. The Service recommends that the Bureau diligently enforce OHV use restrictions if prohibited, unauthorized OHV use occurs near occupied blowout penstemon habitat.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

RE-INITIATION NOTICE

This concludes formal consultation on the Rawlins Resource Management Plan Revision as outlined in your March 17, 2005 request for formal consultation. As provided in 50 CFR 402.16, re-initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing take must cease pending re-initiation.

Thank you for your assistance in the conservation of this endangered, threatened, and candidate species. In future communications regarding this Biological Opinion, please refer to consultation number ES-6-WY-06-F002. If we may be of further assistance, please contact Alex Schubert of my staff at (307) 772-2374, ext. 38.

cc: BLM, Endangered Species Coordinator, State Office, Cheyenne, WY (J. Carroll)
FWS, Endangered Species, Lakewood, CO (B. Fehey)
FWS, Utah ES Office, Salt Lake City, UT (L. Jordan)
WGFD, Statewide Habitat Protection Coordinator, Cheyenne, WY (V. Stelter)
WGFD, Non-Game Coordinator, Lander, WY (B. Oakleaf)

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APPENDIX I – CONSERVATION MEASURES FOR THE RAWLINS RESOURCE MANAGEMENT PLAN

These conservation measures are taken verbatim from the Rawlins Resource Management Plan (RMP) Biological Assessment (BA) (BLM 2006). Implementation of the following conservation measures are intended to minimize, or eliminate, adverse impacts to Threatened, Endangered, Candidate, and Proposed (T&E) species that are likely to result from implementation of the management actions provided in the Rawlins Resource Management Plan Planning Area (RMPPA). The U.S. Bureau of Land Management (Bureau or BLM) has committed to implementing the following conservation measures. The Bureau has been active in conservation of listed and candidate species, and is committed to playing a key role in the recovery effort for these species.

The following binding conservation measures will reduce potential effects to T&E species and their habitats and highlight the steps the Bureau can take to work towards recovery of the species.

General Conservation Measures

The following conservation measures will be implemented within the Rawlins RMPPA where there is potential for listed species to occur. Conservation measures are binding measures which the Bureau will implement to facilitate the conservation of all T&E species.

1. Listed and special status species management will be addressed in four primary ways:

    A. Through conservation actions identified as part of a species listing package, as Reasonable and Prudent measures recommended in the biological opinion (BO) from the Service in response to a BA, and through species protection measures determined through collaborative interagency and multidiscipline efforts.

    B. The Bureau-WY Field Offices incorporate the "WY BLM Mitigation Guidelines for Surface-Disturbing and Disruptive Activities." These guidelines [Appendix 1 of the Draft Environmental Impact Statement (DEIS) RMP] state that prior to conducting activities in known or suspected Critical or essential habitat, the Bureau will require inventories or studies in accordance with the Bureau and/or the U.S. Fish and Wildlife Service (Service or USFWS) guidelines to verify the presence or absence of Threatened, Endangered, Candidate, Proposed (T&E) and Special Status Species or assume species presence. 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.

    C. The "Standards for Healthy Rangelands (1997)." As stated, the "standards apply to all resource uses on public lands." However, the Guidelines (Appendix 8 of the DEIS RMP) "apply specifically to livestock grazing management practices on the Bureau-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 the management actions, and land management adjustments as necessary.

D. "Special Status/Sensitive Species Management," Bureau Manual 6840, directs RMPPA managers to implement Special Status/Sensitive Species programs (Appendix 10 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 the Bureau has concurred, interagency plans, and conservation agreements; (3) ensuring that all actions comply with the Endangered Species Act of 1973 (ESA), as amended (50 CFR §402), its implementing regulations, and other directives associated with conserving Special Status/Sensitive Species; (4) coordinating RMPPA 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 that all actions authorized, funded, or carried out by the Bureau follow the interagency consultation procedures, as outlined in 50 CFR Part 402; (7) ensuring that results of formal Section 7 consultations, including terms and conditions in incidental take statements, are implemented. Implementation will ensure that actions authorized by the Bureau do not contribute to the need for a species to become listed.

2. Site-specific mitigation measures will be identified by RMPPA biologists at the project level [e.g., during Application for Permit to Drill (APD) and Right-of-Way (ROW) application review processes)] to protect T&E and Special Status Species. To ensure compliance with site-specific protection measures presented in the BA and in project applications, the Bureau and/or a project proponent in coordination with the Bureau will assess potential impacts to T&E and Special Status Species during construction and/or implementation of those projects. Assessments will be on a case-by-case basis during field development.

3. The Bureau 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 effects of authorized actions on T&E and Sensitive Species and their associated habitats (Table 1). These measures apply to all Bureau actions, including but not limited to range management, recreation, mineral development, realty actions, and forestry practices. In addition, the Bureau may recommend that the Wyoming Oil and Gas Conservation Commission and State Land Board adopt policies to ensure Endangered Species Act (ESA) compliance during well permitting on state and private lands.

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

BUREAU REQUIREMENTS FOR INVENTORY, PROTECTION, AND MONITORING OF THREATENED, ENDANGERED, CANDIDATE, PROPOSED (T&E), AND SENSITIVE SPECIES, RAWLINS FIELD OFFICE, WYOMING, 2004	
LAND STATUS	BUREAU REQUIREMENTS[1]
Bureau surface/Bureau subsurface	Conduct data gathering, avoid or reduce impacts as appropriate, and monitor. Early coordination and consultation with the Service to benefit the species will be conducted on a case-by-case basis.
Bureau surface/non-Bureau subsurface	Conduct data gathering, avoid or reduce impacts as appropriate and monitor. Early coordination and consultation with the Service to benefit the species will be conducted on a case-by-case basis.
Non-Bureau surface/Bureau subsurface[2]	Request landowner permission to access lands for inventory and, if granted, conduct data gathering on affected areas and require avoidance or reduction of impacts, and monitor as appropriate. If permission is not granted, the Bureau will require project proponents to obtain access through appropriate legal action and, if obtained, conduct data gathering on affected areas and avoid or reduce impacts, and monitor as appropriate. If legal access is not obtained, no onsite data gathering will be conducted, and all analyses will be performed using alternate methods, and so stated in appropriate analysis document. If it is suspected that T&E and Special Status Species or their habitats may be affected, early coordination and consultation with the Service to benefit the species will be conducted on a case-by-case basis.
Non-Bureau surface/non-Bureau subsurface[3]	If it is suspected that T&E and Special Status Species or their habitats may be affected, early coordination and consultation with the Service to benefit the species will be conducted on a case-by-case basis.

[1] The Bureau 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).

4. All of the proposed applicant-committed species protection measures identified in the Rawlins RMP 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.

5. RMPPA 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, the Bureau will reinitiate consultation with the Service if the effects determination is different than that stated in this BA. Projects will not be authorized during critical time periods to reduce impacts to these species. Early coordination with the Service to benefit the species will be conducted on a case-by-case basis. When project proposals are received, the Bureau will initiate coordination with the Service, at the earliest possible date, so that both agencies can advise on project design. This should minimize the need to redesign projects at a later date to include species conservation measures, determined as appropriate by the Service.

6. 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 in T&E and Special Status Species habitat, unless it benefits the habitat for a T&E species.

7. 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 Bureau. As necessary these roads will be permanently blocked, recontoured, reclaimed, and revegetated to benefit habitat for T&E and Special Status Species.

8. 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 Rights-of-Way (ROWs), and designating limited equipment/materials storage yards and staging areas to benefit habitat for T&E and Special Status Species.

9. 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, flagging, and/or fencing as directed by the Bureau to prohibit wildlife access.

10. 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) (2006). 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.

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

12. 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.

13. RMPPA 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.

14. Construction activities located within identified 100-year flood plains, 500 feet of open water and/or 100 feet 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 groundwaters in connection with surface waters will be utilized for proposed projects. Proper erosion control techniques, such as water bars, netting, riprap, and mulch would be implemented.

15. Pesticide applications and biological control agents will be allowed within known T&E and Special Status Species 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 1/4-mile of habitat and only in cases where insect or noxious and invasive weed outbreaks have the potential to degrade area ecological health. Outside the 1/4-mile buffer, aerial application of pesticides would be carefully planned to prevent drift. The Bureau shall work with the Animal and Plant Health Services (APHIS) and the Service to select a pesticide and method of application that will most effectively manage the infestation and least affect the species.

16. 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.

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

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

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

20. The Statewide Programmatic BAs and Statewide Programmatic BOs authorized for each species, including all of the reasonable and prudent measures and terms and conditions, will be implemented for the Rawlins Resource Area. Conferencing and consultation with the Service will occur for authorized activities that would potentially affect the habitat for all threatened, endangered, candidate, and proposed species within the RMPPA.

Black-footed Ferret Conservation Measures

1. 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 meters (up to 200 meters pursuant to the Federal Land Policy and Management Act [FLPMA]) from these towns/complexes to avoid direct impact to towns.

2. 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 the Service- and Bureau-approved techniques.

3. Information shall be provided and posted in common areas and circulated in a memorandum among all employees and service providers. This information shall illustrate the black-footed ferret and its sign; describe morphology, tracks, scat, skull, habitat characteristics, behavior, current status, and causes of decline; and the relationship between project development and impacts to black-footed ferrets, especially concerning canine distemper. Employees will not have pets on worksites within potential or known ferret habitat, because canine distemper can be transmitted to black-footed ferrets.

4. If any black-footed ferrets or their sign are found within a prairie dog town or complex previously determined to be unsuitable for or free of ferrets, all previously authorized, project-related activities (or actions on any future application that may directly, indirectly, or cumulatively affect the colony/complex) ongoing in such towns or complexes shall be suspended immediately, and Section 7 consultation reinitiated with the Service. The Bureau shall ensure that ferret surveys or other appropriate actions are conducted at such locations.

5. Observations of black-footed ferrets, their sign, or carcasses on a project area and the location of the suspected observation, however obtained, shall be reported within 24 hours to the appropriate local Bureau wildlife biologist and Field Supervisor of the Service's 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 shall be collected by the Service or Bureau employees, and deposited with the Service's Wyoming Field Office.

6. When project proposals are received for areas that still require black-footed ferret surveys (i.e., that are not block-cleared, Service letter of February 2, 2004) and that meet potential habitat criteria as defined by the Service guidelines (USFWS 1989), the Bureau shall initiate coordination with the Service at the earliest possible date so that the Service can provide input. This should minimize the need to redesign projects at a later date to include black-footed ferret conservation measures determined as appropriate by the Service.

7. If suitable prairie dog town/complex avoidance is not possible, surveys of towns/complexes for black-footed ferrets shall be conducted in accordance with the

Service guidelines and recommendations. This information shall be provided to the Bureau and to the Service in accordance with Section 7 of the Act and the Interagency Cooperative Regulations.

8. The Bureau periodically will evaluate potential habitat for translocation or reintroductions in coordination with the Service and in compliance with the recovery/reintroduction measures in the Programmatic Black-footed Ferret BA.

Black-footed Ferret Nonessential Experimental Population in Shirley Basin Conservation Measure

1. Recommended management actions for the Shirley Basin nonessential experimental black-footed ferret population will comply with the U.S. Department of the Interior (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 Conservation Measures

1. Surface disturbing and other disruptive activities will be intensively managed to maintain or enhance identified potential habitat (within 100 meters [330 feet] of the identified 100-year flood plain) 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.

2. In habitat suitable for the Preble's meadow jumping mouse, prescribed fire will be designed to burn no more than 25 percent 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 Service. Because of the unpredictability of fire, this measure will be achieved if no more than 1 of every 4 fires exceeds the 25 percent limit in size. If more than 2 of the first 8 fires in Preble's habitat, exceed 25 percent of the suitable habitat, the Bureau will consult with the Service to revise this standard.

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

4. Surface disturbing and other disruptive activities located within identified or known breeding habitat (within 100 meters [330 feet] of the identified 100-year flood plain) for the Preble's meadow jumping mouse will not be allowed between May 15 and August 15 for the protection of the mouse.

5. Surface disturbing and other disruptive 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.

Preble's Meadow Jumping Mouse Critical Habitat Conservation Measures

1. Surface disturbing and other disruptive activities located on land adjacent to Critical habitat 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.

2. Surface disturbing and other disruptive activities located on land adjacent to Critical habitat within identified or known breeding habitat (within 100 meters [330 feet] of the identified 100-year flood plain) will not be allowed between May 15 and August 15 for the protection of the mouse.

3. Surface disturbing and other disruptive activities that are located on land adjacent to Critical habitat 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.

Canada Lynx Conservation Measures

1. Where lynx are documented to occur, the Bureau will initiate coordination with the Service at the earliest possible date so that the Service 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 Service.

2. BLM shall ensure that key linkage areas that may be important in providing landscape connectivity within and between geographic areas across all ownerships are identified, using best available science.

3. BLM shall ensure that habitat connectivity within and between Lynx Analysis Units (LAUs) is maintained.

4. BLM shall document lynx observations (tracks, sightings, along with date, location, and habitat) and provide these to the Wyoming Natural Diversity Database (WYNDD); and request an annual update from them on all sightings for review in each Field Office (FO).

5. Following a disturbance (blowdown, fire, insects) that could contribute to lynx denning habitat, BLM shall allow no salvage harvest when the affected area is smaller than 5 acres. Some exceptions apply, as specified in the Lynx Conservation and Assessment Strategy (LCAS) timber management project planning standards.

6. BLM shall only allow pre-commercial thinning when stands no longer provide snowshoe hare habitat.

7. In aspen stands, BLM shall ensure that harvest prescriptions apply that favor regeneration of aspen.

8. BLM shall ensure that improvement harvests (commercial thinning, selection, etc.) are designed to retain and improve recruitment of an understory of small diameter conifers and shrubs preferred by hares.

9. In the event of a large wildfire, BLM shall ensure that a post-disturbance assessment prior to salvage harvest is conducted, particularly in stands that were formerly in late successional stages, to evaluate potential for lynx denning and foraging habitat.

10. BLM shall ensure that construction of temporary roads and fire lines are minimized to the extent possible during fire suppression activities and shall ensure revegetation of those that are necessary. Construction on ridges and saddles should be avoided if possible.

11. BLM shall ensure that trails, roads, and lift termini are designed to direct winter use away from diurnal security habitat.

12. To protect the integrity of lynx habitat, BLM shall ensure that (as new information becomes available) winter recreational special use permits (outside of permitted ski areas) that promote snow compacting activities in lynx habitat are evaluated and amended as needed.

13. BLM shall ensure that livestock use in openings created by fire or timber harvest that would delay successful regeneration of the shrub and tree components is not allowed. This regeneration may take three years or longer, and will depend on site-specific conditions.

14. BLM shall ensure that grazing in aspen stands is managed to ensure sprouting and sprout survival sufficient to perpetuate the long-term viability of the clones.

15. Within lynx habitat, BLM shall ensure that livestock grazing in riparian areas and willow patches is managed to maintain or achieve mid seral or higher condition to provide cover and forage for prey species.

16. On projects where over-snow access is required, BLM shall ensure use is restricted to designated routes.

17. Predator control activities, including trapping or poisoning on domestic livestock allotments on federal lands within lynx habitat, shall be conducted by Wildlife Services personnel in accordance with FWS recommendations established through a formal Section 7 consultation process.

18. BLM shall ensure that the potential importance of shrub-steppe habitats in the lynx habitat matrix and in providing landscape connectivity between blocks of lynx habitat is evaluated and considered as integral to overall lynx habitat where appropriate. Livestock grazing within shrub-steppe habitats in such areas should be managed to maintain or achieve mid seral or higher condition, to maximize cover and prey availability. Such areas that are currently in late seral condition should not be degraded.

19. In high-elevation riparian areas, especially those subject to grazing, BLM shall ensure that weed assessments and weed control are conducted to optimize habitat for snowshoe hares.

20. Within lynx habitat, BLM shall ensure that key linkage areas and potential highway crossing areas are identified, using best available science.

21. BLM shall work cooperatively and proactively with the Federal Highway Administration and State Departments of Transportation to identify land corridors necessary to maintain connectivity of lynx habitat and map the location of "key linkage areas" where highway crossings may be needed to provide habitat connectivity and reduce mortality of lynx (and other wildlife).

22. 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.

23. BLM shall ensure that proposed land exchanges, land sales, and special use permits are evaluated for effects on lynx habitat and key linkage areas.

24. If activities are proposed in lynx habitat, BLM shall ensure that stipulations and conditions of approval for limitations on the timing of activities and surface use and occupancy are developed at the leasing and NOS/APD stages. For example, requiring that activities not be conducted at night, when lynx are active; and avoiding activity near denning habitat during the breeding season (April or May to July) to protect vulnerable kittens.

25. BLM shall ensure that snow compaction is minimized when authorizing and monitoring developments. BLM shall encourage remote monitoring of sites that are located in lynx habitat, so that they do not have to be visited daily.

Bald Eagle Conservation Measures

1. 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.

2. 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.

3. Bureau-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.

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

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

   Zone 1 (within 1/2-mile February 1 to August 15): intended to protect active and alternative nests. For active nests, minimal human activity levels are allowed during the period of first occupancy to 2 weeks after fledging.

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

   Zone 3: 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. 1/2-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 Service.

6. Surface disturbing or other disruptive activities potentially disruptive to a bald eagle communal roost will be prohibited within 2 miles of the communal roost during the period of February 1 and August 15 for the protection of the communal roost areas. A communal roost is defined as an area usually less than 10 acres in size that contains or has contained $\geq$ 6 bald eagles on any given night. When required, the Bureau will develop a site management plan (in cooperation with the Service) to identify potential impacts to active bald eagle nests and/or communal roost sites.

7. Surface disturbing or other disruptive activities potentially disruptive to identified bald eagle communal winter roost sites will be prohibited within 1 mile of the winter roost site between November 1 and April 1 for the protection of wintering bald eagles.

8. No ground disturbing activities will be permitted within 0.5 miles 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 Service, Wyoming Field Office.

9. Well locations, roads, and ancillary facilities, and other surface structures requiring a repeated human presence, will not be allowed within ½ mile of active bald eagle nests. The distance may vary depending on factors such as nest activity, nest topographic barriers, and line-of-sight distance.

10. 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 Bureau 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.

11. The Bureau 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.

12. Each year the Bureau will verify the status (active vs. inactive) of known bald eagle nests, communal winter roosts, and concentration areas on lands administered by the Bureau within the RMPPA. As a matter of maintaining inventory information, the Bureau will coordinate annually with the Service, 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.

13. To monitor the impacts of site-specific projects authorized under the RMP that are likely to adversely affect bald eagles, the Bureau 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 CFR 402.14[i][3]). The report, which will be submitted annually to the Service, 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 BA, (ii) compliance with terms and conditions, and (iii) documentation of sightings of bald eagles during activities of each site-specific project.

Western Yellow-billed Cuckoo Conservation Measures

1. 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.

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

3. Surface disturbing or other disruptive activities will be prohibited within 1/2-mile of identified habitat during the period April 15 to August 15 for the protection of nesting Western yellow-billed cuckoos.

Wyoming Toad Conservation Measures

1. Rawlins Field Office (FO) Biologists will conduct or oversee surveys (following established protocol), or assume species presence, for all likely affected Wyoming toad 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 the avoidance of adverse effects is not possible, the Bureau will re-initiate consultation with the Service. Projects will not be authorized during critical time periods to reduce impacts to this species.

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

3. The BLM will place a No Surface Occupancy (NSO) stipulation on any new leases on sites where toads are released. These Wyoming toad release sites will be withdrawn from mineral claims and development under the new regulations developed under 43 CFR 3809.

4. Roads that have the potential to impact the Wyoming toad and are not required for routine operations and maintenance of developed and abandoned projects will be reclaimed as directed by the Bureau. As necessary, these roads will be permanently blocked, re-contoured, reclaimed, and re-vegetated to benefit habitat for the Wyoming toad.

5. Construction activities located within potential and/or known Wyoming toad habitat will be minimized through construction site management by using previously disturbed areas, using existing ROWs, and designating limited equipment/materials storage yards and staging areas.

6. Construction activities located within 500 feet of open water and/or 100 feet of intermittent or ephemeral channels in potential and/or known habitat for the Wyoming toad 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 will be implemented.

7. 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 Wyoming toad habitat, only native species will be selected.

8. Pesticide applications and biological control agents will be allowed within known Wyoming toad habitat on a case-by-case basis. Where possible, biological control of pests would be used rather than chemical control. Where needed, pesticide use will be applied by hand within 1/4-mile of habitat and only in cases where insect or weed outbreaks have the potential to degrade area ecological health. Outside the 1/4-mile buffer, aerial application of pesticides will be carefully planned to prevent drift. The Bureau will work with the Animal and Plant Health Inspection Service (APHIS) and the Service to select a pesticide and method of application that will most effectively manage the infestation and least affect the species.

9. The FO policy for OHV restrictions to existing/designated roads and vehicle routes or closures, if required, will be implemented to protect Wyoming toad populations and habitat.

10. If a Wyoming toad is documented during project construction activities, project activities will cease until sufficient protection measures are developed by the Bureau and in coordination with the Service. In the event that a Wyoming toad is found, killed, or injured during project activities, or a dead individual is encountered, the Service's Wyoming Field Office (307-772-2374) and the Service's Law Enforcement Office (307-261-6365) will be notified within 24 hours of discovery.

11. BLM-administered public lands that contain identified habitat for the Wyoming toad will not be exchanged or sold, unless it benefits the species.

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

13. In wetlands that contain habitat for the Wyoming toad, wading boots will be bleached with a 10 percent solution to prevent the spread of Chytrid fungus.

Platte River Downstream Listed Species and Critical Habitat Conservation Measures

1. The Bureau will continue participation in the Platte River Program.

2. For projects that cause depletions to the Platte River system, the Bureau will initiate formal consultation with the Service. Conservation measures are binding measures which the Bureau will implement to facilitate the conservation of the Platte River Species and their Critical Habitats.

Colorado River Basin Downstream Listed Species and Designated Critical Habitat Conservation Measures

1. The Bureau will continue participation in the Colorado River Program.

2. For projects that cause depletions to the Colorado River system, the Bureau will initiate formal consultation with the Service. Conservation measures are binding measures

which the Bureau will implement to facilitate conservation of the Colorado River Species and their Critical Habitats.

Blowout Penstemon Conservation Measures

1. These two conservation measures will be added to grazing permit renewals in allotments with known blowout penstemon populations.

   A. Place mineral supplements, or new water sources (permanent or temporary), for livestock, wild horses, or wildlife at least 1.0 mile from known blowout penstemon populations. Do not place supplemental feed for livestock, wildlife, or wild horses within 1.0 mile of known blowout penstemon populations. Straw or other feed must be certified weed-free. These restrictions are intended to keep free-ranging livestock away from blowout penstemon populations and subsequent grazing on the blowout penstemon plants. Surveys for blowout penstemon will be conducted in potential blowout penstemon habitat prior to livestock operations projects.

   B. The Bureau will not increase livestock stocking levels in any allotment with pastures containing blowout penstemon populations without consulting the Service. It is unknown to what extent overall impacts due to livestock grazing have on the blowout penstemon—whether it is detrimental due to actual grazing and trampling of plants or beneficial due to livestock removal of adjacent competing vegetation.

2. Biological control of noxious plant species will be prohibited in blowout penstemon habitat until the impact of the control agent has been fully evaluated and determined not to adversely affect the plant population. The Bureau will monitor biological control vectors.

3. Except in cases of extreme ecological health threats (insect or weed outbreaks/ infestations), herbicide treatment of noxious plants/weeds will be prohibited within 0.25 mile of known blowout penstemon populations and insecticide treatments will be prohibited within 1.0 mile of known blowout penstemon populations to protect pollinators.

   Where insect or weed outbreaks have the potential to degrade area ecological health inside the buffers listed above, at the discretion of the Bureau's authorized officer and with concurrence by the Service, the following will apply: where needed, and only on a case-by-case basis, pesticide use within 1.0 mile of known blowout penstemon populations will be applied by hand and herbicides applied by hand within 0.25 mile of blowout penstemon populations, with care taken not to spray blowout penstemon plants.

   Aerial application of herbicides will be carefully planned to prevent drift in areas near known blowout penstemon populations (outside of the 0.25 mile buffer). The Bureau will work with the Animal and Plant Health Inspection Service (APHIS), the Service, and County Weed and Pest Agencies to select pesticides and methods of application that will most effectively manage the infestation and least affect the blowout penstemon.

4. If revegetation projects are conducted within 0.25 miles of known blowout penstemon habitat, only native species will be selected. However, no revegetation projects will be done in known or potential blowout penstemon habitats as the plant requires open non-vegetated to sparsely vegetated sand dune habitat. This conservation measure will be applied within 0.25 miles of known blowout penstemon habitat and will be done to keep non-native species from competing with the blowout penstemon.

5. Limit the use of off-highway vehicles (OHVs) to designated roads and trails within 1.0 mile of *known* blowout penstemon populations, with no exceptions for the "performance of necessary tasks" other than fire fighting and hazardous material cleanup allowed using vehicles off of highways. No OHV competitive events will be allowed within 1.0 mile of known blowout penstemon populations. Existing roads near blowout penstemon populations that are not required for operations or maintenance, or that lead to abandoned projects will be reclaimed as directed by the Bureau.

6. Apply a condition of approval (COA) on all applications for permit to drill (APDs) oil and gas wells for sites within 0.25 miles of any known blowout penstemon populations. This COA will prohibit all authorized surface disturbance and OHV travel from sites containing blowout penstemon populations. Operations outside of the 0.25 mile buffer of the blowout penstemon population, such as "directional drilling" to reach oil or gas resources underneath the blowout penstemon habitat would be acceptable.

7. For known blowout penstemon populations, the Bureau will place a Controlled Surface Use (CSU) stipulation prohibiting all surface disturbances on new oil and gas leases, buffering the area within a 0.25 mile of known blowout penstemon populations. For existing oil and gas leases with known blowout penstemon populations, the Bureau will require the COA in conservation measure #6 above including the same 0.25 mile buffer area around those known blowout penstemon populations.

8. The disposal (sale and removal) of salable minerals, which includes sand, is a discretionary Bureau action and is prohibited within a 0.25 mile buffer area of known blowout penstemon populations.

9. To prevent loss of habitat for the blowout penstemon, the Bureau "shall retain in Federal ownership all habitats essential for the survival and recovery of any listed species, including habitat that was used historically, that has retained its potential to sustain listed species, and is deemed to be essential to their survival" (BLM 2001). Prior to any land tenure adjustments in known blowout penstemon habitat, the Bureau will survey to assess the habitat boundary and retain that area in Federal ownership. Bureau-administered public lands that contain identified habitat for the blowout penstemon will not be exchanged or sold, unless it benefits the species.

10. All proposed rights-of-way projects (powerlines, pipelines, roads, etc.) will be designed and locations selected at least 0.25 mile from any known blowout penstemon habitat to minimize disturbances. If the avoidance of adverse effects is not possible, the Bureau will re-initiate consultation with the Service over the effects of the RMP to the blowout penstemon.

11. The Bureau may have other proposed projects which have not specifically been covered with a buffer distance conservation measure in the above list. Such proposed projects will (1) be designed and locations selected to minimize disturbances to known blowout penstemon populations and (2) will not be authorized within 0.25 miles of any known blowout penstemon populations without concurrence of the Service and the Bureau-authorized officer. If avoidance of adverse effects is not possible, the Bureau will re-initiate consultation with the Service over the effects of the RMP to the blowout penstemon.

Colorado Butterfly Plant Species and Habitat Conservation Measures

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

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

3. The Bureau will manage stream habitats with known populations of Colorado butterfly plant to retain, re-create, or mimic natural hydrology, water quality, and related vegetation dynamics. Projects that may alter natural hydrology or water quality, change the vegetation of the riparian ecosystem and cause direct ground disturbance will be evaluated and redesigned to ensure that adverse effects to populations of the Colorado butterfly plant do not occur.

4. The Bureau will add the following two conservation measures to grazing permit renewals in allotments with known Colorado butterfly plant populations.

    A. The Bureau will ensure the placement of mineral supplements, or new water sources (permanent or temporary), for livestock, wild horses, or wildlife at least 1.0 mile from known Colorado butterfly plant populations. Supplemental feed for livestock, wildlife, or wild horses will not be authorized within 1.0 mile of known Colorado butterfly plant populations. Straw or other feed must be certified weed-free. These restrictions are intended to keep free-ranging livestock away from Colorado butterfly plant populations and potential overgrazing of the areas occupied by the Colorado butterfly plant. Surveys for the Colorado butterfly plant will be conducted in potential Colorado butterfly plant habitat prior to livestock operations-related construction projects.

    B. The Bureau will not increase permitted livestock stocking levels in any allotment with pastures containing known Colorado butterfly plant populations without consulting with the Service.

5. Biological control of noxious plant species will be prohibited within 1.0 mile from known Colorado butterfly plant habitat until the impact of the control agent has been fully evaluated and determined not to adversely affect the plant population. The Bureau will monitor biological control vectors.

6. Except in cases of extreme ecological health (insect or weed outbreaks/infestations), herbicide treatment of noxious plants/weeds will be

prohibited within 0.25 miles of known Colorado butterfly plant populations and insecticide treatments will be prohibited within 1.0 mile of known Colorado butterfly plant populations to protect pollinators.

Where insect or weed outbreaks have the potential to degrade area ecological health inside the buffers listed above, at the discretion of the Bureau's authorized officer and with concurrence by the Service, the following will apply: where needed, and only on a case-by-case basis, pesticide use within 1.0 mile of known Colorado butterfly plant populations will be applied by hand and herbicides applied by hand within 0.25 miles of Colorado butterfly plant populations, with care taken not to spray Colorado butterfly plants.

Aerial application of herbicides will be carefully planned to prevent drift in areas near known Colorado butterfly plant populations (outside of the 0.25 mile buffer). The Bureau will work with the Animal and Plant Health Inspection Service (APHIS), the Service and County Weed and Pest Agencies to select pesticides and methods of application that will most effectively manage the infestation and least affect the Colorado butterfly plant.

7. If revegetation projects are conducted within 0.25 miles of known Colorado butterfly plant habitat, only native species will be selected. This conservation measure will reduce the possibility that non-native species will be introduced and will compete with the Colorado butterfly plant.

8. The Bureau will limit the use of off road vehicles (OHVs) to designated roads and trails within 0.5 mile of known Colorado butterfly plant populations, with no exceptions for the "performance of necessary tasks" other than fire fighting and hazardous material cleanup allowed using vehicles off of highways. No OHV competitive events will be allowed within 1.0 mile of known Colorado butterfly plant populations. Roads that have the potential to impact Colorado butterfly plants and are not required for routine operations or maintenance of developed projects, or lead to abandoned projects will be reclaimed as directed by the Bureau.

9. The Bureau will apply a condition of approval (COA) on all applications for permit to drill (APDs) oil and gas wells for sites within 0.25 miles of any known Colorado butterfly plant populations. This condition will prohibit all authorized surface disturbance and OHV travel from sites containing Colorado butterfly plant populations. Operations outside of the 0.25 mile buffer of the Colorado butterfly plant population, such as "directional drilling" to reach oil or gas resources underneath the Colorado butterfly plant habitat would be acceptable.

10. For known Colorado butterfly plant populations, the Bureau will place a Controlled Surface Use (CSU) stipulation prohibiting all surface disturbances on new oil and gas leases, buffering the area within 0.25 miles of known Colorado butterfly plant populations. For existing oil and gas leases with known Colorado butterfly plant populations (these would be for newly discovered populations not currently documented), the Bureau will require the COA in conservation measure 9 above including the same 0.25 mile buffer area around those known Colorado butterfly plant populations.

11. The disposal (sale and removal) of salable minerals, is a discretionary Bureau-authorized action and is prohibited within a 0.25 mile buffer area of known Colorado butterfly plant populations.

12. To prevent loss of habitat for the Colorado butterfly plant, the Bureau "shall retain in Federal ownership all habitats essential for the survival and recovery of any listed species, including habitat that was used historically, that has retained its potential to sustain listed species, and is deemed to be essential to their survival". Prior to any land tenure adjustments in known Colorado butterfly plant habitat, the Bureau will survey to assess the habitat boundary and retain that area in Federal ownership. Bureau-administered public lands that contain identified habitat for the Colorado butterfly plant will not be exchanged or sold, unless it benefits the species.

13. All proposed rights-of-way projects (powerlines, pipelines, roads, etc.) will be designed and locations selected at least 0.25 miles from any known Colorado butterfly plant habitat to minimize disturbances. If the avoidance of adverse affects is not possible, the Bureau will re-initiate consultation with the Service.

14. All proposed projects will be designed and locations selected to minimize disturbances to known Colorado butterfly plant populations, and if the avoidance of adverse effects is not possible, the Bureau will re-initiate consultation with the Service. Projects will not be authorized closer than 0.25 miles from any known Colorado butterfly plant populations without concurrence of the Service and the Bureau authorized officer. No ground disturbing construction activities will be authorized within 0.25 miles of any known Colorado butterfly plant populations during the essential growing season time period (from June through September, the growing, flowering and fruiting stages) to reduce impacts to the species.

15. In order to conserve and protect natural areas, planned recreational foot trails are created to control human traffic. The Bureau will create programs that will strive to protect the Colorado butterfly plant's habitat and prevent new trails from being created within 0.25 miles from known occurrences of the plant.

Colorado Butterfly Plant Designated Critical Habitat Conservation Measures

1. The Bureau will apply a condition of approval (COA) on all applications for permit to drill (APDs) oil and gas wells for sites within 0.25 miles of any Colorado butterfly plant designated critical habitat. This condition will prohibit all authorized surface disturbance and OHV travel from sites containing Colorado butterfly plant designated critical habitat. Operations outside of the 0.25 mile buffer of Colorado butterfly plant designated critical habitat, such as "directional drilling" to reach oil or gas resources underneath the Colorado butterfly plant designated critical habitat, would be acceptable.

2. The Bureau will place a Controlled Surface Use (CSU) stipulation prohibiting all surface disturbances on new oil and gas leases, buffering the area within 0.25 miles of Colorado butterfly plant designated critical habitat. For existing oil and gas leases with Colorado butterfly plant designated critical habitat, the Bureau will require the COA in conservation measure #1 above including the same 0.25 mile buffer area around Colorado butterfly plant designated critical habitat.

3. Grazing will be intensively managed within designated critical habitat containing populations of Colorado butterfly plants from June through September, to allow plants to flower and go to seed.

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

5. The Bureau will ensure the placement of mineral supplements, or new water sources (permanent or temporary), for livestock, wild horses, or wildlife at least 1.0 mile from Colorado butterfly plant designated critical habitat. Supplemental feed for livestock, wildlife, or wild horses will not be authorized within 1.0 mile of Colorado butterfly plant designated critical habitat. Straw or other feed must be certified weed-free. These restrictions are intended to keep free-ranging livestock away from Colorado butterfly plant designated critical habitat and potential over-utilization of these designated critical habitats.

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

Ute Ladies'-tresses Conservation Measures

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

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

3. The Bureau will manage stream habitats to retain, re-create, or mimic natural hydrology, water quality, and related vegetation dynamics. Projects upstream and downstream may alter natural hydrology or water quality, change the vegetation of the riparian ecosystem and cause direct ground disturbance. These projects may adversely affect the orchid. These projects will be evaluated and redesigned to ensure that adverse effects to known populations of the orchid do not occur.

4. The Bureau will add the following two conservation measures to grazing permit renewals in allotments with known populations of Ute ladies'-tresses.

    A. The Bureau will ensure the placement of mineral supplements, or new water sources (permanent or temporary), for livestock, wild horses, or wildlife at least 1.0 mile from known Ute ladies'-tresses populations. Supplemental feed for livestock, wildlife, or wild horses will not be authorized within 1.0 mile of known Ute ladies'-tresses populations. Straw or other feed must be certified weed-free. These restrictions are intended to keep free-ranging livestock away from Ute ladies'-tresses populations and potential overgrazing of the areas occupied by these orchids. Surveys for Ute ladies'-tresses will be conducted in potential Ute ladies'-tresses habitat prior to livestock operations-related construction projects.

B. The Bureau will not increase permitted livestock stocking levels in any allotment with pastures containing known Ute ladies'-tresses populations without consulting with the Service.

5. Biological control of noxious plant species will be prohibited within 1.0 mile from known Ute ladies'-tresses orchid habitat until the impact of the control agent has been fully evaluated and determined not to adversely affect the plant population. The Bureau will monitor biological control vectors.

6. Except in cases of extreme ecological health (insect or weed outbreaks/infestations), herbicide treatment of noxious plants/weeds will be well-regulated within 0.25 miles of known populations of the orchid and insecticide treatments will be well-regulated within 1.0 mile of known populations of Ute ladies'-tresses to protect pollinators.

   Where insect or weed outbreaks have the potential to degrade area ecological health inside the buffers listed above the following will apply: a pesticide use proposal or other site specific plan will address concerns of proper timing, methods of use, and chemicals. Pesticides specifics to dicots will be preferred where these are adequate to control the noxious weeds present.

   Aerial application of herbicides will be carefully planned to prevent drift in areas near known populations of the orchid (outside of the 0.25 mile buffer). The Bureau will work with the Animal and Plant Health Inspection Service (APHIS), the Service, and County Weed and Pest Agencies to select pesticides and methods of application that will most effectively manage the infestation and least affect the orchid.

7. If revegetation projects are conducted within 0.25 miles of known habitat for Ute ladies'-tresses orchids, only native species will be selected. This conservation measure will reduce the possibility that non-native species will be introduced and will compete with Ute ladies'-tresses orchids.

8. The Bureau will limit the use of off road vehicles (OHVs) to designated roads and trails within 0.5 miles of known Ute ladies'-tresses populations, with no exceptions for the "performance of necessary tasks" other than fire fighting and hazardous material cleanup allowed using vehicles off of highways. No OHV competitive events will be allowed within 1.0 mile of known Ute ladies'-tresses populations. Roads that have the potential to impact Ute ladies'-tresses orchids and are not required for routine operations or maintenance of developed projects, or lead to abandoned projects will be reclaimed as directed by the Bureau.

9. The Bureau will apply a condition of approval (COA) on all applications for permit to drill (APDs) oil and gas wells for sites within 0.25 miles of any known populations of the orchid. This condition will prohibit all authorized surface disturbance and OHV travel from sites containing populations of the orchid. Operations outside of the 0.25 mile buffer of orchid populations, such as "directional drilling" to reach oil or gas resources underneath the orchid's habitat, would be acceptable.

10. For known Ute ladies'-tresses populations, the Bureau will place a Controlled Surface Use (CSU) stipulation prohibiting all surface disturbances on new oil and gas leases, buffering the area within 0.25 miles of known Ute ladies'-tresses populations.

11. The disposal (sale and removal) of salable minerals is a discretionary Bureau action and is prohibited within a 0.25 mile buffer area of known Ute ladies'-tresses populations.

12. To prevent loss of habitat for the orchid, the Bureau "shall retain in Federal ownership all habitats essential for the survival and recovery of any listed species, including habitat that was used historically, that has retained its potential to sustain listed species, and is deemed to be essential to their survival" (BLM 2001). Prior to any land tenure adjustments in known habitat for the orchid, the Bureau will survey to assess the habitat boundary and retain that area in Federal ownership. Bureau-administered public lands that contain identified habitat for the orchid will not be exchanged or sold, unless it benefits the species.

13. All proposed rights-of-way projects (powerlines, pipelines, roads, etc.) will be designed and locations selected at least 0.25 miles from any known orchid habitat to minimize disturbances. If avoidance of adverse effects is not possible, the Bureau will re-initiate consultation with the Service.

14. All proposed projects will be designed and locations selected to minimize disturbances to known Ute ladies'-tresses populations, and if the avoidance of adverse affects to known populations is not possible, the Bureau will re-initiate consultation with the Service. Projects will not be authorized closer than 0.25 miles from any known populations of the orchid without concurrence/re-initiation of consultation of the Service and the Bureau authorized officer. No ground disturbing construction activities will be authorized within 0.25 miles of any known populations of the orchid during the essential growing season time period (from July through September, the growing, flowering and fruiting stages) to reduce impacts to the species.

15. In order to conserve and protect natural areas, planned recreational foot trails are created to control human traffic. The Bureau will create programs that will strive to protect the orchid's habitat and prevent new trails from being constructed within 0.25 miles from known occurrences of the orchid.

APPENDIX I - REFERENCES

Avian Power Line Interaction Committee (APLIC). 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, CA.

United States Bureau of Land Management (BLM). 2001. Manual 6840 – Special Status Species Management. United Statues Department of the Interior Bureau of Land Management. January 19, 2001. 41 pp. + Glossary.

-------. 2006. Rawlins Biological Assessment. Bureau of Land Management. Rawlins Field Office. July 2006. 192 pp.

United States Fish and Wildlife Service (USFWS). 1989. Black-footed ferret survey guidelines for compliance with the Endangered Species Act, April 1989. U.S. Fish and Wildlife Service, Denver, Colorado and Albuquerque, New Mexico. 15 pp.

APPENDIX II – BEST MANAGEMENT PRACTICES FOR THE RAWLINS RESOURCE MANAGEMENT PLAN

These Best Management Practices (BMP) are taken verbatim from the Rawlins Resource Management Plan (RMP) Biological Assessment BA (BLM 2006). Implementation of the following best management practices are intended to minimize, or eliminate, adverse impacts to Threatened, Endangered, Candidate, and Proposed (T&E species) that are likely to result from implementation of the management actions provided in the Rawlins RMP. The Bureau has been active in conservation of listed and candidate species, and is committed to playing a key role in the recovery effort for these species.

The following recommended Best Management Practices will reduce potential effects to listed and candidate species and their habitats and highlight the steps the Bureau can take to work towards recovery of the species.

Black-Footed Ferret Best Management Practices

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

2. The Bureau should continue to follow the recovery plan and review activities to ensure consistency and compliance.

3. When possible, new prairie dog towns would be allowed to become established on public lands.

4. When possible, new access roads would avoid intersecting prairie dog colonies.

5. When available, Service fact sheets would be posted in common areas and circulated in a memorandum among all Bureau employees and service providers. Fact sheets would illustrate the black-footed ferret and its sign; and describe morphology, tracks, scat, skull, habitat characteristics, behavior, current status, and causes of decline.

6. Recreational shooting of prairie dogs would be discouraged on public lands.

7. Develop prairie dog management plans with ongoing monitoring and protection of prairie dog towns and complexes.

8. Follow the guidelines outlined in the Wyoming Black-tailed Prairie Dog Management Plan (Wyoming Black-tailed Prairie Dog Working Group 2001) and the White-tailed Prairie Dog Conservation Assessment (Seglund et al. 2004). Encourage Wyoming Game and Fish Commission to remove unprotected status on prairie dogs and provide regulatory mechanisms.

9. Establish land stewardship agreements with other agencies and/or private landowners where large (1,000 acres) prairie dog towns or complexes exist. These agreements can control potential uses that may be detrimental to prairie dogs and their habitats while preserving the landowner's intent for use.

10. Avoid sale or exchange of lands and attempt to acquire parcels with prairie dogs on them, especially those that have potential as part of a black-footed ferret reintroduction effort.

11. Initiate to the extent feasible land exchanges in the Shirley Basin areas to increase the land area in federal ownership.

12. Eliminate livestock grazing practices that degrade habitat in prairie dog colonies. Reduce or eliminate grazing during drought, avoid vegetation stand conversions that have been shown to be detrimental to prairie dogs, and reduce or eliminate any other suspected ecosystem-degrading grazing practices.

13. Encourage, support, and/or establish a prairie dog research program addressing issues such as the effect of shooting and oil and gas development on prairie dogs, sylvatic plague control, and population viability analysis.

14. Because knowledge of the effects of resource extraction on white-tailed prairie dog populations is limited, monitoring at sites before, during, and after energy development is recommended (Seglund et al. 2004).

15. If geologically and technically feasible, drill multiple wells from the same pad using directional (horizontal) drilling technologies (up to 16 wells per pad, as technologically feasible).

16. Avoid further oil and gas exploration and development in occupied prairie dog colonies. Apply NSO stipulations to all occupied and recovery prairie dog habitat. Avoid seismic activity in occupied or recovery prairie dog habitat.

Preble's Meadow Jumping Mouse Best Management Practices

1. The Bureau 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.

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

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

4. Minimize new trail, road, or Rights-of-Way (ROW) development within 100 meters of the 100-year flood plain 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 and Critical Habitat Best Management Practices

1. In Critical Habitat, conduct a survey before beginning any potential disturbing activities.

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

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

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

5. Minimize new trail, road, or ROW development within 100 meters of the 100-year flood plain 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.

6. 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 and channelization, straightening riparian channels, and for riprap projects.

Canada Lynx Best Management Practices

1. Evaluations should be made on Bureau-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 that would not negatively impact Canada lynx. Chemical treatments would be considered when beneficial to habitat composition and structure.

2. Design regeneration prescriptions to mimic historical fire (or other natural disturbance) events, including retention of fire-killed dead trees and coarse woody debris.

3. Design harvest units to mimic the pattern and scale of natural disturbances and retain natural connectivity across the landscape. Evaluate the potential of riparian zones, ridges, and saddles to provide connectivity

4. Provide for continuing availability of foraging habitat in proximity to denning habitat.

5. In areas where recruitment of additional denning habitat is desired, or to extend the production of snowshoe hare foraging habitat where forage quality and quantity is declining due to plant succession, consider improvement harvests (commercial thinning, selection, etc). Improvement harvests should be designed to retain and recruit the understory of small diameter conifers and shrubs preferred by hares; retain and recruit coarse woody debris, consistent with the likely availability of such material under natural disturbance regimes; and maintain or improve the juxtaposition of denning and foraging habitat.

6. Provide 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. Focus vegetation management, including timber harvest and use of prescribed fire, in areas that have potential to improve snowshoe hare habitat (dense horizontal cover) but that presently have poorly developed understories that have little value to snowshoe hares.

7. Burn prescriptions should be designed to retain or encourage shrub and tree species composition and structure that will be 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. Design burn prescriptions to promote response by shrub and tree species that are favored by snowshoe hare and thus regenerate or create snowshoe hare habitat (e.g., regeneration of aspen and lodgepole pine).

8. Consider the need for pre-treatment of fuels before conducting management ignitions.

9. Design burn prescriptions and, where feasible, conduct fire suppression actions in a manner that maximizes lynx denning habitat.

10. 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. Discourage recreational use in areas where it is shown to compromise lynx habitat. Such actions should be undertaken on a priority basis considering habitat function and importance.

11. Provide a landscape with interconnected blocks of foraging habitat where snowmobile, cross-country skiing, snowshoeing, or other snow compacting activities are minimized or discouraged.

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

13. 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.

14. Minimize roadside brushing in order to provide snowshoe hare habitat.

15. Limit public use on temporary roads constructed for timber sales. Design new roads, especially the entrance, for effective closure upon completion of sale activities.

16. Limit public use on temporary and permanent roads constructed for access to timber sales, mines, and leases. Design new roads, especially the entrance, for effective closure. Upon project completion, reclaim or obliterate these roads.

17. Minimize building of roads directly on ridgetops or areas identified as important for lynx habitat connectivity, and close to 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, reclamation and obliteration of roads.

18. Initiate and/or augment interagency information and education efforts throughout the range of lynx in the contiguous states. Work cooperatively and proactively with WGFD and other agencies to reduce incidental take of lynx related to trapping and/or mistaken shooting of lynx, as well as to ensure that important lynx prey are conserved. 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. Provide for unified management direction via habitat conservation plans, conservation easements or agreements, and land acquisitions.

19. Where needed, develop measures such as wildlife fencing and associated underpasses or overpasses to reduce mortality risk.

20. Where applicable on Bureau-administered lands, key-linkage riparian corridors and habitat for potential lynx prey species should be enhanced or maintained (using U.S. Forest Service guidelines when possible). On public lands, these management practices will be compatible with providing habitat connectivity. The BLM will strive to work with landowners to develop conservation easements, exchanges, or other solutions, as well as pursue opportunities for cooperative management with other landowners. Evaluate whether land ownership and management practices are compatible with maintaining lynx highway crossings in key linkage areas.

21. 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.

22. In land adjustment programs, identify key linkage areas. Work towards unified management direction via habitat conservation plans, conservation easements or agreements, and land acquisition.

23. Plan recreational development, and manage recreational and operational uses to provide for lynx movement and to maintain effectiveness of lynx habitat.

24. 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.

25. Using best available science, develop a plan to 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.

26. When opportunities for vegetation treatments come up, develop treatments that provide or develop characteristics suitable for snowshoe hare.

27. Protect existing snowshoe hare and red squirrel habitat.

Bald Eagle Best Management Practices

1. Proponents of Bureau-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.

2. The Bureau 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. The Service should also be included in this coordination.

3. 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.

4. The Bureau 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 general ecological awareness of habitat disturbance.

5. The Bureau 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.

6. The Bureau should periodically review existing water quality records [e.g., Wyoming Department of Environmental Quality (WDEQ), WGFD, U.S. Geological Survey (USGS), etc.] from monitoring stations on, or near, important bald eagle habitats (i.e., nests, roosts, concentration areas) on public land for any conditions that could adversely affect the species. If water quality problems are identified, the Bureau should contact the

appropriate jurisdictional entity to cooperatively monitor the condition and/or take corrective action.

Western Yellow-billed Cuckoo Best Management Practices

1. Best management practices would be applied to surface disturbing and other disruptive activities to maintain or enhance the Western yellow-billed cuckoo and their habitats.

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

3. Where possible, biological control of pests would be used rather than chemical control. Where needed, pesticide use would be applied by hand within 1/4-mile of cuckoo habitat, and only in cases where insect or noxious and invasive weed outbreaks have the potential to degrade area ecological health. Outside the 1/4-mile buffer, aerial application of pesticides would be carefully planned to prevent drift. The Bureau shall work with APHIS and the Service to select a pesticide and method of application that will most effectively manage the infestation and least affect the Western yellow-billed cuckoo.

4. Ensure adequate livestock practices 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.

5. All high-quality riparian areas of 20 hectares (49.42 acres) or more shall be managed to preserve, protect, and, if necessary, restore natural functions to minimize degradation of streambanks and the loss of riparian habitat.

6. 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 streambanks in cuckoo habitat.

7. 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, they shall be constructed at right angles to minimize impacts to riparian vegetation, streambanks, 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 ROWs to one stream-crossing site.

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

9. Maintain beaver populations where they occur in cuckoo habitat and encourage reintroduction into areas that were historically occupied by beavers in Western yellow-billed cuckoo habitat.

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

11. 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.

12. 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 Best Management Practices

1. Train enforcement personnel on protection of the Wyoming toad and its habitat, its status, and current threats to its existence.

2. Educate resource specialists, rangers, and fire crews about the Wyoming toad and its habitat, particularly for fire suppression projects planned for this general area.

3. Educate resource specialists and promote practices to minimize the spread of Wyoming toad diseases including chytridiomycosis.

4. Develop and prioritize management practices through a steering committee (in conjunction with a Wyoming toad recovery team) and assist the USFWS with research.

5. Establish monitoring, biological, ecological, and life history studies as funding and staffing allow, such as studies regarding monitoring the success of reintroduction efforts and occurrence of disease in new Wyoming toad populations.

6. Monitor primary and secondary Wyoming toad habitats for changes in water quality.

7. 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.

8. Buffers should be established around water bodies and wetlands within 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).

9. The Bureau should work towards developing reintroduction sites in coordination with the Service and the Wyoming Game and Fish Department (WGFD) and maintain the integrity of these sites for the survival of the toad.

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

11. 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.

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

13. Establish grazing restrictions within and adjacent to primary and secondary habitat as well as the Mortenson Lake NWR and Hutton Lake NWR.

North Platte River Basin Species and Designated Critical Habitat Best Management Practices

1. When developing or improving water source in the North Platte River system, the Bureau should 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 Best Management Practices

1. When developing or improving water source in the Colorado River system, the Bureau should 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 Best Management Practices

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

2. Designate Areas of Critical Environmental Concern (ACECs) for the known populations of blowout penstemon (will add future populations to the ACEC as they are found) within all four affected Bureau resource areas, beginning with the Rawlins Resource Area. If these known populations of blowout penstemon are designated as an ACEC, they will require a plan of operations to be completed for any operations causing surface disturbance greater than causal use and a National Environmental Policy Act (NEPA) review before locatable mineral claims can be explored, mined and developed (43 CFR 3809 regulations).

3. The BLM will participate in the development of both, a conservation agreement, assessment and strategy and a species specific recovery plan for the blowout penstemon in coordination with the Service and other agencies as appropriate. Populations and habitat of the blowout penstemon on Bureau-administered lands will be monitored to determine if recovery/conservation objectives are being met.

4. Limit the use of off highway vehicles (OHVs) to designated roads and trails within 1.0 mile of *potential* blowout penstemon habitat, with no exceptions for the performance of necessary tasks other than fire fighting and hazardous material cleanup allowed using vehicles off road. No OHV competitive events will be allowed within 1.0 mile of potential blowout penstemon populations.

5. Coordinate with the Service, the National Resource Conservation Service, and private landowners to ensure adequate protection for the blowout penstemon and its habitat when new activities are proposed, and to work proactively to enhance the survival of the plant.

6. To prevent grazing of blowout penstemon plants by livestock, keep livestock at least 0.25 miles away from known blowout penstemon populations during the essential growing season (from April 15 to September 15 - the growing, flowering and fruiting stages) through herding of livestock away from known blowout penstemon populations, or by excluding livestock from pastures with known blowout penstemon populations.

7. Known blowout penstemon habitat should be fenced to keep livestock from grazing blowout penstemon plants. However, this is usually not practicable due to the difficulty in placing fences in a sandy substrate and high maintenance costs or the inability to maintain the fences. Placement of permanent fencing, or temporary electric fences around blowout penstemon populations and habitat could be done on a larger scale by fencing off a much larger area around sand dunes. Generally, the sand dune complexes that comprise blowout penstemon habitat are very extant, sometimes running for dozens of miles, making fencing difficult if not impossible. In the unlikely event that permanent fencing is placed around known blowout penstemon populations or habitats during the essential growing season, mineral supplements and water sources may be placed outside of the fences closer than the 1.0 mile specified in the conservation measures, to the known blowout penstemon habitat at the discretion of the Bureau's authorized officer.

8. In the event that a new population of blowout penstemon is found, the USFWS Wyoming Field Office (307-772-2374) will be notified within one week of discovery.

9. Initiate land tenure adjustments to acquire lands with populations of blowout penstemon or potential habitat to ensure a higher level of protection under the Endangered Species Act of 1973, as amended (50 CFR §402) on Federal lands for the blowout penstemon.

10. To prevent loss of habitat for the blowout penstemon, the Bureau "shall retain in Federal ownership all habitats essential for the survival and recovery of any listed species, including habitat that was used historically, that has retained its potential to sustain listed species, and is deemed to be essential to their survival" (BLM 2001). Prior to any land tenure adjustments in potential blowout penstemon habitat, the Bureau will survey to assess the potential for the existence of blowout penstemon. While it is difficult to assess whether the blowout penstemon was historically present on such sites, the Bureau should try and retain in Federal ownership all habitats essential for the survival and recovery of the blowout penstemon, including habitat that was used historically, that has retained its potential to sustain this listed species, and is deemed to be essential to their survival (BLM 2001). Potential blowout penstemon habitat may be used for reintroduction efforts and is important for the recovery and enhancement of the species.

11. Form a steering committee to develop and prioritize management practices and assist Bureau and the Service with research projects.

12. A comprehensive inventory of the Dune Pond Cooperative Management Area for blowout penstemon should be completed (Rawlins FO).

13. Conduct inventories for blowout penstemon in areas with potential habitat in the Rawlins, Casper, Rock Springs, and Lander Resource Areas [The University of Wyoming, Wyoming Natural Diversity Database recently completed a "Survey of *Penstemon haydenii* (Blowout Penstemon) in Wyoming 2004 (Heidel 2005)," which documented all known locations of blowout penstemon in Wyoming through 2004].

14. Maintain a database of all searched, inventoried, or monitored blowout penstemon sites.

15. Analyze vegetation treatments (mowing, prescribed fire, mechanical treatments, etc.) in known or potential blowout penstemon habitat for impacts to the species. Fire management activities will be utilized to maintain early successional plant communities which would potentially provide additional habitat for the blowout penstemon plant.

16. Monitor blowout penstemon sites for invasion by noxious and invasive plant species.

17. Establish monitoring, biological, ecological, and life history studies as funding and staffing allow, such as, monitoring current populations each year for trends, studies regarding identification of pollinators, genetics, life history, effects of pesticides and herbicides, seed viability and germination, and studies regarding monitoring the success of reintroduction efforts. The Rawlins Resource Area is currently conducting pollination studies through Utah State University, U.S. Department of Agriculture Bee Biology & Systematics Laboratory.

18. Collect and bank blowout penstemon seeds at local, regional, national, and international arboreta, seed banks, and botanical gardens as insurance against catastrophic events, for use in biological studies, and for possible introduction/reintroduction into potential habitat.

19. Train law enforcement personnel on protections for the plant and its habitat, its status, and current threats to its existence.

20. Educate resource specialists, rangers, and fire crews about the blowout penstemon and its habitat to help with project design for the general area and for fire suppression actions occurring in potential habitat for the blowout penstemon and on the habitat characteristics and plant identification for the plant, so that if they encounter a penstemon occurring in sandy habitats, they can report it to their office threatened and endangered species specialist.

21. The BLM should work towards developing reintroduction sites in coordination with the Service and to maintain the integrity of these sites for the survival of the blowout penstemon. The objective would be to reintroduce populations of blowout penstemon into areas of historic occurrence and introduce new populations in suitable habitat within the plant's historic range.

22. Develop propagation techniques and use them to reintroduce/introduce the blowout penstemon and to repopulate known populations in the event population recovery becomes necessary.

Colorado Butterfly Plant Best Management Practices

1. 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.

2. 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.

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

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

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

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

7. 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 Best Management Practices

1. 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.

2. 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.

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

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

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

6. Monitor Colorado butterfly plant sites for invasion by noxious weeds. Evaluate herbicide and pesticide control for negative effects on a case-by-case basis.

7. Collect and bank Colorado butterfly plant sites for invasion by noxious and invasive weeds. Evaluate herbicide and pesticide control for negative effects on a case-by-case basis.

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

Ute Ladies'-tresses Best Management Practices

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

2. 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.

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

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

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

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

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

APPENDIX II - REFERENCES

Heidel, B. 2005. Survey of *Penstemon haydenii* (Blowout Penstemon) in Wyoming -- 2004. Prepared for the Casper and Rawlins field office of the Bureau of Land Management, Agreement #KAA041037. Wyoming Natural Diversity Database, University of Wyoming, Laramie, WY. 36 pp. + Appendices.

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United States Bureau of Land Management (BLM). 2006. Rawlins Biological Assessment. Bureau of Land Management. Rawlins Field Office. July 2006. 192 pp.

Wyoming Black-tailed Prairie Dog Working Group. 2001. Final Draft Wyoming Black-tailed Prairie Dog Management Plan. Draft. Technical assistance in developing this plan was provided by Martin Grenier, Non-game Mammal Biologist, and Bob Oakleaf, Non-game Coordinator, Wyoming Game and Fish Department Non-game Program, June 15, 2001.

APPENDIX III - DESCRIPTION OF PROGRAM ACTIVITIES FOR THE RAWLINS RMP

These program descriptions are summarized from the Rawlins Biological Assessment (BLM 2006) and Draft Environmental Impact Statement (BLM 2004). It is expected that the activities described here will implemented in the Rawlins Resource Area over the life of the approved Rawlins RMP (10-15 years).

Air Quality. The Bureau's Air Quality program consists of monitoring efforts in cooperation with U.S. Forest Service, Wyoming Department of Environmental Quality (DEQ), and U.S. Environmental Protection Agency (EPA), and evaluating and restricting surface development. Monitoring for air quality components (i.e., carbon monoxide [CO], nitrogen dioxide [NO_2], sulfur dioxide [SO_2], ozone, particulate matter [PM_{10}], visibility, and atmospheric deposition) is conducted from various facilities around Wyoming.

Regional haze regulations developed by EPA require the Bureau to measure the distance at which 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 contaminates in the Rawlins Resource 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 PM_{10}, NO_2, ozone, SO_2, and 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 PM_{10}, SO_2, and NO_2. 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.

The State of Wyoming maintains air quality standards and determines whether it is necessary to regulate emissions. When necessary, the State regulates emissions through its State Implementation Plan (SIP) for air quality by promulgating the appropriate rule. Objectives of the State of Wyoming SIP include the protection of public health and safety and the well-being of sensitive natural resources. Thus, the Bureau minimizes, within the scope of its authority, any emissions that may add to atmospheric deposition, cause violations of air quality standards, or degrade visibility. The Environmental Protection Agency (EPA) provides oversight responsibility during this process and approves the State of Wyoming SIP, if appropriate.

State standards enforced in the Rawlins Resource Area will be as stringent or more stringent than federal standards. Special requirements to alleviate air quality impacts will be considered on a case-by-case basis in processing land use authorizations.

The Bureau cooperates with the operation of the National Atmospheric Deposition Program (NADP)/National Trends Network atmospheric deposition monitoring site, as well as in the collection of basic climate and meteorological data from remote automatic weather stations. The NADP sites included in this analysis are Snowy Range, Brooklyn Lake, and South Pass City. The Bureau follows the specific guidance for the application of air quality protection measures (Appendix 4, BLM 2004) within the Rawlins Resource Area.

Cultural Resources. Under this program, the Bureau performs a variety of activities to preserve, protect, and restore cultural and historical resources. The Bureau 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 Bureau's cultural resource land management activities involve managing sites for scientific, public, and sociocultural use; developing interpretive sites; restricting certain land uses; closing certain areas to exploration; prohibiting some surface disturbing activities; and preparing interpretive materials. The Bureau also seeks listing of eligible sites on the National Register of Historic Places, installs protective fencing for 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 Bureau performs cultural resource inventories normally in response to other surface disturbance activities. Inventories include transects set 30 meters (100 feet) apart from each other. Cultural resources are identified and protected on a case-by-case basis, according to site-specific needs. Cultural properties eligible for National Register of Historic Places (NRHP) listing are managed for preservation of cultural and historic values (Appendix 5, BLM 2004).

Fire and Fuels Management. The two major categories of activities involved in the Bureau's fire management program are fuels treatments (including biological, chemical, prescribed burning, and mechanical treatments) and wildland fire suppression. During fuels treatment activities, the Bureau 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. They 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 conducted 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 the intensity of the wildland fire and can involve the use of off-highway vehicles (OHV), hand tools, aviation resources, and heavy equipment such as bulldozers. Firelines 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 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 Bureau may use rehabilitation techniques to stabilize the 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 Bureau seeks to effectively protect life, property, and resource values from wildland fire. The Bureau uses fire suppression on fires endangering human life or on fires that come within one mile of state or private lands, structures, and facilities. Acres of wildland fire fluctuate annually. Recent trends throughout the Wyoming Bureau are similar to trends throughout the West, with larger, catastrophic fires in recent years due to drought conditions and past fire suppression policies.

The Bureau manages wildland fire mitigation and fuels activities to first provide for firefighter and public safety. Public lands within the checkerboard or other intermixed landownership areas are managed in association with the private and state lands therein. The appropriate management response (AMR) most often results in suppression activities (Map 2-1, BLM 2004).

The AMRs for special management areas (SMA) protect or enhance the relevant and important values of the ACEC or other SMAs requiring special management attention. A high priority for fire management activities is given to areas identified as communities at risk, industrial interface areas, and areas containing resource values considered high priority within the resource area (Map 2-1, BLM 2004).

Fuel treatments, including prescribed fire and mechanical, chemical, and biological treatments, are used for fuels reduction and to meet other multiple-use resource objectives, including returning fire to its natural role in the ecosystem (Table 2-1, BLM 2004). Identified wildland-urban interfaces (WUI) and communities at risk receive priority for fuels reduction.

Rehabilitation and restoration efforts are undertaken to protect and sustain ecosystems, public health, and safety, and to help communities protect infrastructure.

Forest Management. The Bureau's forest management program involves 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 preharvest phase, trees are cut and removed or treated if diseased. Permits are issued for precommercial thinning, chaining, and shearing. Harvesting activities include clearcuts, selective cutting, slash disposal, commercial thinning, helicopter/traditional logging, and skidder-type yarding and 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 the 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 with new seedlings), and stand replacements; fences regenerated areas; and conducts rehabilitation surveys. Under the Proposed Action, all forest and woodlands in the planning area will be open to noncommercial harvest of minor wood products, such as fuelwood, posts and poles, Christmas trees, and wildings. Forest and woodlands management will also include manipulation of aspen, juniper, and other noncommercial tree species to meet forest health and/or other multiple-use objectives.

Lands and Realty. During lands and realty management activities, the Bureau seeks to support multiple-use management goals of the Bureau resource programs; responds to public requests for land use authorizations, sales, and exchanges; and acquires and designates rights-of-way (ROWs) access to serve administrative and public needs.

ROWs granted by the Bureau 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 (power lines) associated with proposed projects and/or activities. In addition the Bureau authorizes ROWs and leases for utility transportation corridors. A ROW 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 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 Bureau implements or authorizes programs that may or may not require stipulations and protective measures. Activities include but are limited to designating, canceling, or changing stock driveways; processing locatable mineral entry withdrawals; and establishing protective withdrawals.

In addition, the Bureau pursues cooperative agreements, develops recreation site facilities, considers offsite mitigation, minimizes access in wildlife habitat, fences re-vegetation sites, blocks linear ROWs to vehicle use, considers temporary use permits (less than 3 years—e.g., rig stacking, and 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.

Under this program, the Bureau also authorizes wind energy development. Wind turbines authorized by the Bureau typically are up to 180 feet in height, with an 80-foot turbine diameter. Each turbine will encompass approximately 1.2 acres. Ancillary uses include meteorological towers, roads, and power lines.

Under the Proposed Action, the Rawlins Resource Area will be open to operation of the public land laws, the Mining Law of 1872, and to locatable mineral entry except for 1,582,260 acres of existing withdrawals.

In compliance with Section 204(1) of FLPMA, reviews of withdrawn lands in the resource area will be completed to determine whether existing withdrawals are serving or needed for their intended purposes.

The existing withdrawals in the planning area will remain in place unless or until it is determined they should be terminated and, if necessary, a plan amendment to the Rawlins RMP is made. Such determination or amendment would be based on full examination of the issues associated with withdrawal terminations, including the land use, environmental, and other factors associated with opening public lands now closed to entry under the public land laws or to mineral location under the mining laws. Where appropriate and necessary to protect other resource values, new withdrawals will be pursued and implemented prior to terminating any existing withdrawals (Table 2-2, BLM 2004).

Nonfederal lands will be considered for acquisition to meet the objectives of the various resource management programs. Examples of lands that will be acquired include inholdings within WSAs, some SMAs, and HMAs (Appendix 6, BLM 2004).

Proposals for alternative energy development will be considered on a case-by-case basis. No proposals for alternative energy development, other than wind power, are anticipated to occur in the foreseeable future; therefore, only wind energy potential will be considered. Proposals for location of wind energy development will be considered on a case-by-case basis and subject to a site-specific NEPA analysis. Areas with important or sensitive resource values will be avoided. Avoidance areas will vary by alternative.

Under the Proposed Action, all Bureau-administered public lands, except WSAs and some SMAs (including ACECs), will be open to consideration for placement of transportation and utility ROW systems. Each transportation system and utility ROW will be located adjacent to existing facilities, when possible.

Areas with important or sensitive resource values will be avoided. Existing major transportation and utility ROW routes (Map 2-2, BLM 2004) will be designated corridors.

However, major transportation routes within the resource area that are located east of the Carbon County-Albany County line will not be considered for ROW corridor designation because of the scattered public land ownership pattern in the area. All corridors will be designated for power lines (above ground and buried), telephone lines, fiber optic lines, pipelines, access roads and other linear type ROWs.

Specific proposals will require site-specific environmental analysis and compliance with established permitting processes. Activities generally excluded from ROW corridors include mineral materials disposal, range and wildlife habitat improvements involving surface disturbance and facility construction, campgrounds, and public recreation facilities and other facilities that attract public use.

ROW facilities will not be placed adjacent to each other if issues with safety or incompatibility or resource conflicts are identified. The designated width, allowable uses, and excluded uses for each corridor may be modified during implementation of the approved RMP. All designated ROW corridors will avoid to the extent possible those areas identified (Map 17, Table 2-3, BLM 2004).

The number, type, extent, and proximity of new ROWs within designated corridors will be determined when the criteria (Appendix 6, BLM 2004) for each corridor are identified. Mitigation requirements for surface-disturbing and disruptive activities would be applied to activities related to utility/transportation systems to protect important resource values (Appendix 1, BLM 2004).

Certain lands withdrawn for Seminoe Reservoir (2,000 acres) and the Savery-Pothook area (1,205 acres), currently managed by the Bureau of Reclamation (BOR), are being considered for revocation (Appendix 7, BLM 2004). The revocation was reviewed by the Bureau and a determination made that the lands are suitable for return to public domain status because they are no longer needed for the purpose for which they were withdrawn. Lands considered for revocation have been reviewed for management options and a determination made that these lands will be managed the same as adjacent public lands.

Livestock Management. A number of activities make up the Bureau'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. Other activities for livestock management include supplemental feeding and herding of livestock. Range improvements include fence construction, maintenance, and modification (including exclosures and cattle guards), water developments (reservoirs, seeps, springs, pipelines, catchments, and wells), and instream structures.

Livestock grazing is managed to provide for protection or enhancement of all resource values. The Wyoming Standards for Healthy Rangelands (BLM 1997) are implemented when authorizing livestock grazing use and related activities in the planning area (Appendix 8, BLM 2004).

The current amounts, kinds, and seasons of livestock grazing use will authorized until monitoring indicates a grazing use adjustment is necessary, or that a class of livestock or season of use modification can be accommodated. Monitoring will include coordination, consultation, and negotiation with grazing permittees.

Requests for changes in season-of-use or kind-of-livestock will be considered on a case-by-case basis and reviewed to determine range suitability and to evaluate potential impacts to both riparian and upland vegetation and other land resource uses.

Designated camping areas, wetland/riparian spring exclosures, sensitive plant species exclosures, some wildlife management areas, coal mines, and some oil and gas production facilities are closed to grazing.

Domestic sheep and goats will not be authorized within nine miles of identified wild bighorn sheep habitat unless a natural or topographic feature provides an effective barrier (Map 2-3, BLM 2004).

Minerals. The Bureau's mineral development program is divided into three categories. These categories are disposable minerals (common variety 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 mainly are used for maintaining roads and for activities associated with the oil and gas industry. The Bureau 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 Rawlins Resource Area. These materials may be disposable or available by a free use permit to state and local governments.

Before issuing contracts or free use permits for common variety minerals, the Bureau 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 ensure that the land can later be used productively for other purposes. Reclamation includes removing all artificial 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 Bureau.

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 resource area containing coal resources of subbituminous 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 both 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 (Seminoe No. II mine and Medicine Bow mine). These existing mines are expected to remain in operation for less than 2 years.

Most activity in the remaining fields has typically been 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 Bureau's Rawlins field office. Rawlins field office personnel then review the parcel for potential conflicts with other resources, and appropriate stipulations for the 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, coalbed 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 aboveground power lines 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 Rawlins field office. The Bureau 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 ensure that conditions of approval are followed. Activities that 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 federally-listed and special status species are applied to both the subsurface estate and to the surface activities because of the federal nexus of the actions. In this case, for example, federal minerals underlie a nonfederal surface and federally-listed and special status species are protected with wildlife restrictions. Wildlife stipulations for other species not associated with threatened and endangered species will not apply when a split-estate situation occurs (federal minerals/nonfederal surface) and a proposed project is analyzed.

The Bureau develops and implements surface disturbance restrictions by incorporation of conditions of approval in the site-specific analysis. The restrictions vary depending on the type of resource to

be protected. Some examples of restrictions include NSO 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 for those withdrawn to protect other resource values and uses, or those lands with acquired mineral status. The Bureau 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 the Endangered Species Act of 1973 (as amended) (50 CFR §402) (Act), the National Historic Preservation Act (NHPA), and all applicable state requirements.

Bentonite, uranium, and gypsum are the principle locatable minerals of the Wyoming Bureau. Other locatable metallic minerals include silver, gold, platinum, cobalt, and other precious minerals. At this time no active metallic mineral mining occurs on Bureau-managed public lands, except for occasional recreational panning in the resource 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 Environmental Impact Statement (EIS). All lands must be reclaimed after expiration of mining.

The Energy Policy and Conservation Act Amendments (EPCA) of 2000, Public Law (PL) 106-469, directed the Secretary of the Interior to conduct an inventory of oil and natural gas resources beneath federal lands. The act also directed the Department of Interior to identify the extent and nature of any restrictions to resource development. As a result, the Departments of the Interior, Agriculture, and Energy released a report, Scientific Inventory of Onshore Federal Lands' Oil and Gas Resources and Reserves and the Extent and Nature of Restrictions or Impediments to their Development (EPCA Inventory), in January 2003.

The Bureau is integrating the results of the EPCA Inventory into the Rawlins RMP. The oil and gas resource inventory data is integrated into the Reasonable Foreseeable Development (RFD) scenario that predicts future mineral development within the resource area.

Impact minimizing requirements are monitored to determine if more or less restrictive measures might accomplish the same goal. Oil and gas lease stipulations may be modified or eliminated using the exception, modification, or waiver criteria (Appendix 9, BLM 2004) or through more site-specific environmental analysis. Those stipulations that are either too restrictive or too lenient to accomplish the desired resource protection will be changed if monitoring or new scientific data justify the change. Clarifying changes may be made to the wording of oil and gas lease stipulations as long as there is no substantial change to the impact-minimizing protection, as justified by new scientific data or monitoring.

There is no reasonably foreseeable coal development in the Rawlins Resource Area for the 20-year analysis period for the RMP. Only the first two steps of the coal screening process (Appendix 2, BLM 2004) have been conducted on the federal coal lands that have federal coal occurrence, which resulted in a determination that approximately 5,029 acres (containing an estimated 70.1 million tons of surface mineable federal coal) were unsuitable for surface coal mining. Approximately 56,240 acres (containing an estimated 2,388.8 million tons of surface mineable federal coal) were identified as acceptable for further leasing consideration (Appendix Maps A2-2, A2-3, and A2-4, BLM 2004). The remaining steps of the coal leasing process would be completed upon receipt of a lease-by-application.

Per regulations found at 43 CFR 3461, the coal screening process cannot be applied to lands currently leased for coal. Within the Rawlins Resource Area, seven existing coal leases are exempt from the coal screening process: Hanna Basin (six leases; 19,016 acres of federal coal land) and Carbon Basin (one lease; 5,235 acres of federal coal land).

The only coal activity analyzed in the DEIS is reclamation activity in the Hanna Basin. Future economic conditions may change and make the existing Hanna Basin coal leases more likely to be developed. In Carbon Basin, in addition to the existing lease acreage, an additional 6,693 acres and 163,300,000 tons of federal coal are acceptable for further consideration for leasing as a result of the 1998 Carbon Basin RMP Amendment.

No decisions on lands acceptable for further consideration for leasing would be made until after a lease application is received.

Leases would be considered on a case-by-case basis only, as lease applications are received. The first two steps of the coal screening process would be revisited, and coal screening would be completed (including the multiple-use screen and the surface-owner consultation screen).

Federal coal lease applications would be accepted only on those federal coal lands with development potential identified as acceptable for further leasing consideration after application of the coal unsuitability criteria (the above-mentioned approximately 56,240 acres and 2,388.8 million tons of surface mineable federal coal) (Maps A2-2, A2-3, and A2-4 and Appendix 2, BLM 2004).

In the DEIS, the Bureau considers about 6,693 acres of federal coal lands containing 163 million tons of federal coal in the Carbon Basin to be acceptable for further leasing consideration. Of the 6,693 acres of federal coal lands, the Bureau considers 120 acres to be acceptable for leasing consideration by subsurface mining methods only. This decision has been carried forward from the 1998 Carbon Basin RMP Amendment (1998 Carbon Basin RMP Amendment for acreages, tonnages, and locations of areas within the Carbon Basin acceptable for leasing consideration).

All lands open to oil and gas leasing consideration also would be open to geophysical exploration, subject to appropriate resource surveys, surface protection measures, adequate bonding, and adherence to State of Wyoming standards for geophysical operations.

Vehicular use for necessary tasks, such as geophysical exploration including project survey and layout, is subject to off-highway vehicle (OHV) designations. Exceptions may be necessary to protect other resources on a case-by-case basis following environmental analysis.

With the exception of WSAs and some other SMAs, the remainder of the planning area would be open to consideration for leasing of oil shale, geothermal resources, and non-energy leasable minerals.

Approximately 1,582,260 acres would be closed to locatable mineral entry under existing mineral location withdrawals (Map 2-4, BLM 2004). The remainder of the planning area would be open to mineral location.

Stipulations to protect sensitive resource values would be based on interdisciplinary review of individual proposals and environmental analysis.
Mineral material disposals are discretionary actions. Disposal would be considered on a case-by-case basis. Stipulations to protect important surface values would be based on interdisciplinary review of individual proposals.

Off-Highway Vehicle. The Bureau implements management in areas designated as closed, limited, or open to OHV use. The Bureau posts signs, develops maps or brochures, and monitors OHV use. OHV use on Bureau-administered lands is limited to existing roads and vehicle routes. Over-the-snow vehicles (snowmobiles) are allowed to go cross-country. By the year 2008, OHV use will be limited to designated roads and vehicle routes, 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 wilderness study areas (WSA) 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 Bureau permits OHV events.

The Bureau recognizes the use of bicycles and other human-powered, mechanized conveyances as appropriate recreational activities. The Wyoming Bureau 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 as it is designated by Congress as a wilderness area. Wheelchairs will be allowed despite designation of use.

With some exceptions, the resource area would be open to use of motorized over-the-snow vehicles, provided that they do not adversely affect wildlife or vegetation (Table 2-1, BLM 2004).

In conformance with the Bureau's Washington Office IM No. 2004-005 (October 1, 2003), the resource area will be divided into areas that are open, limited, or closed to OHV travel (Map 2-5, BLM 2004). Those areas that are designated limited may have seasonal restrictions or travel limitations to either existing or designated roads and vehicle routes, or any combination of these. Until the designation process is completed, travel in Limited to Designated Areas (LDA) would remain limited to existing roads and vehicle routes. Travel on parcels of public land not having legal public access would remain limited to existing roads and vehicle routes.

Off-road OHV use would be allowed for necessary tasks except in WSAs and specific SMAs (Table 2-1, BLM 2004).

The Encampment River Canyon Area (about 6,700 acres) would be closed to motorized vehicle use, including over-the-snow vehicles, December 1 to April 30, to reduce stress on wildlife that may winter in the canyon area. The Encampment River Trail would be closed to all types of motorized vehicle use year-round.

Paleontological Resources. The Bureau performs a variety of activities to preserve, protect, and restore paleontological resources. During inventory activities, the Bureau 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 handtools, power tools, or heavy machinery. The Bureau'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., burying exposed sites), preparing interpretive materials, and allowing the collection of certain invertebrate fossils. The Bureau pursues withdrawal of areas from exploration and development of locatable minerals, designates avoidance areas, pursues cooperative agreements, and identifies and interprets paleontological sites.

Paleontological resources would be managed to protect their important scientific values. Area closures, restrictions, or other mitigation requirements for the protection of paleontological values would be determined on a case-by-case basis. Collecting of scientifically significant vertebrate fossils by qualified paleontologists would be allowed by permit only.

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 Bureau lands include hiking, hunting, mountain biking, floating, fishing, OHV use (including snowmobiles), horseback riding, backpacking, rockhounding, and camping. Large recreational events may be issued Special Recreation Permits. The Bureau authorizes commercial recreation uses.

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

Recreation program management includes monitoring OHV use and high-use areas, and contacting visitors in the field. The Bureau 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 resource area, although some parcels would receive minimal use during the winter because of poor access and adverse weather conditions. The numbers of individuals that participate in outdoor recreational activities has been increasing steadily, and, except for hunting, this trend is expected to continue. Visitor use is highest during the summer months.

Existing recreation sites would be maintained or improved to assure continued availability to the recreating public. Additional recreation sites would be considered for development based on need or demand, site suitability, and legal public access.

The entire resource area would be open to dispersed recreation with the exception of specific areas that must be excluded to protect public health and safety or special resource values.

Special Management Areas. Under the Special Management Areas (SMA) Program, the Bureau closes areas where accelerated erosion is occurring; implements logging and heavy equipment use restrictions; evaluates noxious and invasive weed and pest control measures; applies restrictions on ground disturbing and other disruptive activities; develops recreational trails; guides supervised tours; protects petroglyphs, artifacts, and cultural deposits from weathering and vandalism; and pursues land exchanges. The objectives of SMAs 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. SMAs within the RMPPA include the Sand Hills Area of Critical Environmental Concern (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 Special Recreation Management Area (SRMA), and the North Platte River SRMA.

Wilderness Study Areas. WSAs (Map 2-6, BLM 2004) would be managed according to the Interim Management Policy for Lands Under Wilderness Review, until Congress either designates each WSA as "wilderness" or releases it from consideration and it reverts to multiple-use land. The Ferris Mountains WSA (21,880 acres) would be closed to all types of motorized vehicle use.

Areas of Critical Environmental Concern. Under different alternatives, designations of the following areas vary from ACEC to areas with other special management prescriptions (Table 2-1 and Maps 2-7 through 2-13, BLM 2004). Occurrence and acreages vary per alternative for each of these areas.

Como Bluff Area. Case-by-case examination of any proposed surface-disturbing and disruptive activities would be made to determine potential adverse effects and appropriate mitigation would be applied to minimize those effects.

Sand Hills Area and Potential JO Ranch Expansion. No surface occupancy would be allowed on the 18 acres around the JO Ranch buildings. Developments, uses, and facilities would be managed spatially to avoid damage to vegetation.

Jep Canyon Area. Surface-disturbing activities would be intensively managed to prevent loss of significant habitat. Management would be applied on a case-by-case basis to determine potential adverse effects and appropriate mitigation to minimize those effects. Developments, uses, and facilities would be managed to avoid damage to vegetation and wildlife habitat.

Shamrock Hills Area. Surface-disturbing activities would be intensively managed to maintain raptor-nesting habitat. Management would be applied on a case-by-case basis. Developments, uses, and facilities would be managed to avoid damage to vegetation and wildlife habitat. The area would be open to oil and gas leasing with intensive management of surface-disturbing and disruptive activities.

Stratton Sagebrush Steppe Research Area. The entire area (5,530 acres) would be closed to locatable mineral entry, mineral material disposal, and land tenure adjustments, including sales. Withdrawals would be pursued. Motorized vehicle use would be limited to designated roads and vehicle routes.

Laramie Peak Area. The area would be open to oil and gas leasing with intensive management of surface-disturbing and disruptive activities. Plans of operations would be required for locatable mineral exploration and development (except casual use), for disturbance of five acres or more.

Red Rim-Daley Area. The area would be open to oil and gas leasing with intensive management of surface-disturbing and disruptive activities.

Pennock Mountain Area. The Pennock Mountain crucial elk winter range (9,806 acres) would be closed to human presence from November 15 to April 30.

Wick-Beumee Area. The public land within the Wick-Beumee wildlife habitat management area (280 acres) (Map 2-10, BLM 2004) would be managed as a wildlife habitat management area. The Wick-Beumee crucial elk winter range (280 acres) would be closed to motorized vehicle use, including over-the-snow vehicles, from November 15 to April 30.

Historic Trails (Cherokee, Overland, Rawlins to Baggs, and Rawlins to Fort Washakie). Sections of the historic trails with intact trail traces (two-tracks, etc.) would be preserved in their present condition. Historic trail use that would result in adverse effects to the trail trace (Appendix 5, BLM 2004) would be evaluated on a case-by-case basis. Actions resulting in linear crossings of the trails would be evaluated on a case-by-case basis, and surface disturbing and disruptive activities would be intensively managed. Where the setting of the trails contributes to NRHP eligibility, actions resulting in visual elements that diminish the integrity of the property's significant historic features would be intensively managed. Unevaluated portions of the trail setting would be managed as contributing until a cultural inventory is completed and the setting is determined to be contributing or noncontributing (Appendix 5, BLM 2004).

Upper Muddy Creek Watershed/Grizzly Area. To protect the Colorado River cutthroat trout reintroduction area, 4,520 acres of public lands and 69,770,000 tons of federal coal would be unsuitable for further leasing consideration (Map A2-4, BLM 2004). Rehabilitation of degraded

stream reaches would be carried out in specific problem areas. Livestock grazing use would be managed to provide for protection or enhancement of other resource values.

High Savery Dam Area. The area would be cooperatively managed for recreational and multiple-use objectives and irrigation water, consistent wit the June 2003 MOU between Wyoming Water Development Commission (WWDC) and the Bureau (Appendix 23, BLM 2004). The area would be open to mineral leasing with a NSO stipulation. For public safety and protection of structures and facilities, public access would be closed to vehicular travel. Public access would be restricted to foot travel only. The WWDC would be responsible for water, wetland, and riparian management on the subject public lands, as required by the U.S. Army Corps of Engineers (COE) Section 404 permit for the High Savery Dam and Reservoir Project. Management of these resources would be coordinated with the Bureau. The High Savery allotment would be open to livestock grazing to meet vegetative management goals and the objectives for the High Savery Dam and Reservoir Project area. Grazing use would be authorized on a temporary, nonrenewable basis.

Special Recreation Management Areas. Continental Divide National Scenic Trail SRMA. The Continental Divide National Scenic Trail (600 acres; the federal portion of the trail consists of about 82 miles by 60 feet) would be managed to provide opportunities for trail users to view the diverse topographic, geographic, vegetative, wildlife, and scenic phenomena that characterize the Continental Divide and to observe examples of human use of the natural resources. The Special Resource Management Area (SRMA) would be managed to protect the corridor. Land exchanges and easement acquisitions would be pursued to improve the continuity of the trail where opportunities arise. Kiosks would be erected at each end of the Rawlins Resource Area portion of the trail to provide information on access to the trail. The area would be open to oil and gas leasing with intensive management of surface-disturbing and disruptive activities.

North Platte River Area. Access opportunities to the North Platte River would be identified and pursued.

Rawlins OHV Area. The area would be closed to livestock grazing.

National Natural Landmarks. Lands totaling 800 acres in the Big Hollow National Natural Landmark (NNL) and 160 acres in the Sand Creek NNL would be considered for disposal to individuals, organizations, agencies, or institutions that would manage these areas in accordance with their NNL status (Map 2-18, BLM 2004).

Encampment River Potential Wild and Scenic River. The Encampment River Potential Wild and Scenic River (WSR) (Map 2-19, BLM 2004) would be managed to maintain or enhance the outstanding remarkable values and classification (Appendix 3, BLM 2004). This potential WSR falls entirely within the Encampment River WSA, which constrains the development of alternative interim management prescriptions. Interim management actions for the Encampment River that are common to all alternatives include (1) temporary cultural and paleontological activities would be allowed on the public lands, (2) public lands would be closed to oil and gas leasing, and closed to locatable mineral entry and operation of the public land laws including sale and withdrawals would be pursued, (3) public lands would be closed to recreational dredging, and to surface-disturbing and disruptive activities such as major recreational developments, ROWs and some minor recreational

developments such as hiking trails and signs would be allowed, (4) public lands would be closed to development of water impoundments, diversions, or hydroelectric power facilities, (5) public lands would be closed to motorized vehicles and non-motorized vehicles, e.g., bicycles, wheelchairs, game carts, would be restricted to existing trails, (6) public lands would be closed to commercial timber harvest, (7) range improvements and increases in grazing preference would not be allowed, (8) public lands would be managed as Visual Resource Management (VRM) Class I, and (9) the area would be designated an AMR fire suppression area.

Transportation and Access Management. Transportation and access management activities are generally in support of other resource management programs. Under this program 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 Bureau 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 threatened or endangered plants or animals will be postponed or modified to protect the presence of these species, and consultation with the Service will be initiated.

As part of the vegetation management program, the Bureau conducts prescribed burns, spraying, and light and heavy mechanical treatments; uses species-specific insects and livestock grazing; implements noxious and invasive weed and pest control programs; and plants vegetation. Light mechanical control includes cutting and thinning with handtools. Heavy mechanical control includes brushbeating, cutting, and thinning with machinery.

Noxious and invasive weeds are located within the Rawlins Resource Area. Noxious weeds are listed by the state, whereas invasive weed species are listed by the Bureau. The three types of noxious weeds or invasive weeds control measures used by the Bureau on public lands are chemical, biological, and mechanical. Weed control is conducted 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 ROWs and oil- and gas-related facilities are applied using vehicle-mounted sprayers and aircraft. Biological controls include using microbiotic organisms (fungus and rusts) and insects (beetles, midges, and wasps) and are applied by hand. Ungulates (goats and livestock) used to control noxious and invasive weeds are herded. Mechanical control is normally performed through hand-pulling and digging, which is not as intrusive as mowing or other machine use.

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

A visual resource inventory and classification process is a qualitative analysis performed throughout 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 Bureau lands in the planning area were classified as Class I in the WSAs; 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; Class IV in heavily industrialized and coalbearing areas; and Class III in the remainder of the Rawlins Resource Area.

Effectively, Class I areas prohibit surface disturbances because they are in WSAs. Class I areas preserve the existing character of the landscape, provide for natural ecological changes only, and do not preclude very limited management activity. In Class I areas, the level of change to the characteristic landscape should be extremely low and must not attract attention. Class I areas include primitive areas, WSAs, some natural areas, some WSRs, 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: the existing character of the landscape should be retained; 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. If a proposal cannot 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 are areas 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 are 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 Bureau 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 Bureau watershed management activities include evaluating proposed projects, applying soil management practices, applying seasonal closures, monitoring public drinking water, and completing groundwater 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; practicing stream improvement practices, such as increasing sinuosity in channels by using handtools to construct natural structures that include rock or other natural materials; constructing artificial instream structures using heavy equipment, steel, geotextile 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, power lines, 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 Rawlins Resource Area mainly are in support of other programs.

Through water resource management, the Bureau 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 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 Bureau develops pollution prevention plans; ensures that 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 Bureau also provides technical expertise on other activities, such as livestock ponds and waterfowl monitoring activities, and provides impact analyses of oil and gas development or any surface disturbance projects. The Bureau provides technical expertise in reestablishing floodplains, iron mines, and contoured railroad grades.

The Bureau 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 Bureau 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 Endangered Species Act (Act) of 1973, as amended (50 CFR §402.14), Bureau Manual 6840, and approved recovery plans. The Bureau wildlife habitat management program supports population objective levels in the Wyoming Game and Fish Department (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 Animal and Plant Health Inspection Service (APHIS) of the U.S. Department of Agriculture (USDA). Inventory and monitoring include habitat assessments and species surveys and are used to assess the effectiveness of the implementation of timing stipulations, reducing conflicts between species and other activities, and for appropriate mitigation. In addition, inventory and monitoring are used to identify and describe habitat requirements and life history characteristics of threatened, endangered, or 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 resources; 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 handtools; 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 electroshocking for sampling fish communities and for population studies; constructing instream barriers to protect species from non-native invaders; installing 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 Bureau in its 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 an LUP, the Bureau uses monitoring data to determine appropriate management level (AML). The Bureau manages wild horse populations to maintain viable herds. Considerations include how many animal unit months (AUM) the range can support, trends in utilization, and public input. The Bureau wild horse management specialists coordinate with wildlife biologists and archeologists 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, 60 to 30 feet in size.

APPENDIX III – REFERENCES

United States Bureau of Land Management (BLM). 1997. Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for the Public Lands Administered by the Bureau of Land Management in the State of Wyoming. U.S. Bureau of Land Management. Cheyenne, WY. 8 pp.

-------. 2004. Draft Environmental Impact Statement for the Rawlins Resource Management Plan. U.S. Bureau of Land Management. Rawlins, Wyoming

-------. 2006. Rawlins Biological Assessment. Bureau of Land Management. Rawlins Field Office. July 2006. 192 pp.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

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NOV 30 2007

In Reply Refer To:
ES-61411/W.02/WY0FI0041

Memorandum

To: Dennis Carpenter, Field Manager, Bureau of Land Management, Rawlins Field Office, Rawlins, Wyoming

From: Brian T. Kelly, Field Supervisor, U.S. Fish and Wildlife Service, Wyoming Field Office, Cheyenne

Subject: Continuation of Section 7 Consultation for the Rawlins Resource Management Plan

This correspondence is in response to the November 9, 2007, U.S. Bureau of Land Management (Bureau) letter (6840(030)), and Biological Assessment (BA) supplement received in our office on November 13, requesting continuation of section 7 consultation under the Endangered Species Act of 1973, as amended (Act) (U.S.C. 1531 *et. seq.*). A U.S. Fish and Wildlife Service (Service) Biological Opinion (BO) (ES-6-WY-06-F002) was issued January 16, 2007 for the Bureau's Rawlins Resource Management Plan (RMP). Subsequent to the issuance of that BO, the Bureau modified the description of the proposed RMP to include surface discharge of extracted water from oil and gas development—an activity not previously analyzed in either the BO or the Bureau's biological assessment (BA) for the RMP. At issue are potential effects which could arise from surface discharge of extracted water to four species (Eisler 1985, Hamilton 1999, Hamilton *et al.* 2002, Lemly 2002) listed as endangered under the Act: the bonytail chub (*Gila elegans*), Colorado pikeminnow (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), razorback sucker (*Xyrauchen texanus*) and their designated critical habitat downstream in the Colorado River system.

The Bureau's November 9 letter and BA supplement analyzed potential effects to these listed fish and their downstream critical habitat from surface discharge of water from oil and gas development activities. In that BA supplement, the Bureau determined that surface discharge of water from these activities as potentially authorized under the Rawlins RMP 'may affect, but are not likely to adversely affect' the four endangered Colorado River fishes and their designated critical habitat. After considering (1) the Bureau's description of surface discharge activities potentially authorized under the proposed Rawlins RMP, and (2) the Bureau's commitment to conservation measures including future water quality monitoring activities (see Attachment), the Service concurs with the Bureau's determination. Furthermore, any actions implemented under the Rawlins RMP that 'may affect' listed species or their designated critical habitat, would require separate section 7 consultation at the project level.

The Rawlins RMP should be re-analyzed if new information reveals effects of the RMP that may affect listed or proposed species or designated or proposed critical habitat in a manner or to an extent not considered in this consultation; if the Rawlins RMP is subsequently modified in a manner that causes an effect to a listed or proposed species or designated or proposed critical habitat that was not considered in this consultation; and/or, if a new species is listed or critical habitat is designated that may be affected by the RMP. If you have questions regarding this memorandum or the section 7 consultation process, please contact Alex Schubert of my staff at (307) 772-2374, extension 238.

Attachment (1)

References

Eisler, R. 1985. Selenium hazards to fish, wildlife and invertebrates: a synoptic review. U.S. Fish and Wildlife Service Biological Report 85(1.5). 41 pp.

Hamilton, S. J. 1999. Hypothesis of Historical Effects from Selenium on Endangered Fish in the Colorado River Basin. Human and Ecological Risk Assessment 5(6):1153-1180.

-------, K. M. Holley, K. J. Buhl, F. A. Bullard, L. K. Weston, and S. F. McDonald. 2002. Impact of Selenium and Other Trace Elements on the Endangered Adult Razorback Sucker. Environmental Toxicology 17:297-323.

Lemly, A. D. 2002. A Procedure for Setting Environmentally Safe Total Maximum Daily Loads (TMDLs) for Selenium. Ecotoxicology and Environmental Safety 52:123-127.

Conservation Measures

Implementation of the following conservation measures are intended to minimize, or eliminate, adverse impacts to Threatened, Endangered, Candidate, and Proposed (T&E) species that are likely to result from implementation of the management actions provided in the Rawlins Resource Management Plan Planning Area (RMPPA). The U.S. Bureau of Land Management (Bureau or BLM) has committed to implementing the following conservation measures. The Bureau has been active in conservation of listed and candidate species, and is committed to playing a key role in the recovery effort for these species.

The following binding conservation measures will reduce potential effects to T&E species and their habitats and highlight the steps the Bureau can take to work towards recovery of the species. Conservation measures are binding measures which the Bureau will implement to facilitate the conservation of T&E species.

1) The Bureau will continue to participate in the Upper Colorado River Endangered Fish Recovery Program.

2) Prior to approval of projects that allow surface discharge of produced water, the Bureau will ensure that the following conservation measures are implemented within a regional frame work for water resource monitoring to prevent selenium-induced or other contaminant-induced impacts from changes in water quality and/or water quantity related to oil and gas development to the Colorado River fishes or their designated critical habitat from production of ground water within the Colorado River Basin. The monitoring framework will aid in the development of a credible, science based, efficient monitoring plan for the Rawlins Resource Management Planning Area (RMPPA). Developing a thorough monitoring plan following the criteria established in the monitoring framework will allow integration of pertinent existing monitoring into a comprehensive approach. This combined effort will provide the information needed for the BLM and State Regulatory agencies to understand existing surface and ground water conditions. It will also allow for the development of a set of actions necessary to maintain water quality within established standards in the RMPPA and that can be used in an Adaptive Management approach:

    a) Obtain existing data on waterborne selenium and other potentially deleterious water quality constituent concentrations in the RMPPA as determined appropriate by the Bureau in tributaries to the Colorado River Basin to determine baseline for any future cumulative impacts to water quality.

    b) If water quality data is not available for Muddy Creek and the Little Snake River, water sampling would be conducted in Muddy Creek and the Little Snake River to obtain adequate baseline data on selenium and other potentially deleterious water quality constituents.

    c) If baseline water quality data show that selenium and/or other potentially deleterious water quality constituents in Muddy Creek and or the Little Snake River become elevated from oil and gas development activities, the Bureau will recommend to the Wyoming Department of Environmental Quality (WDEQ), and the U.S. Environmental Protection Agency, that total maximum daily loads (TMDL) are developed for Muddy Creek and/or the Little Snake River to prevent adverse impacts to the endangered Colorado River fishes.

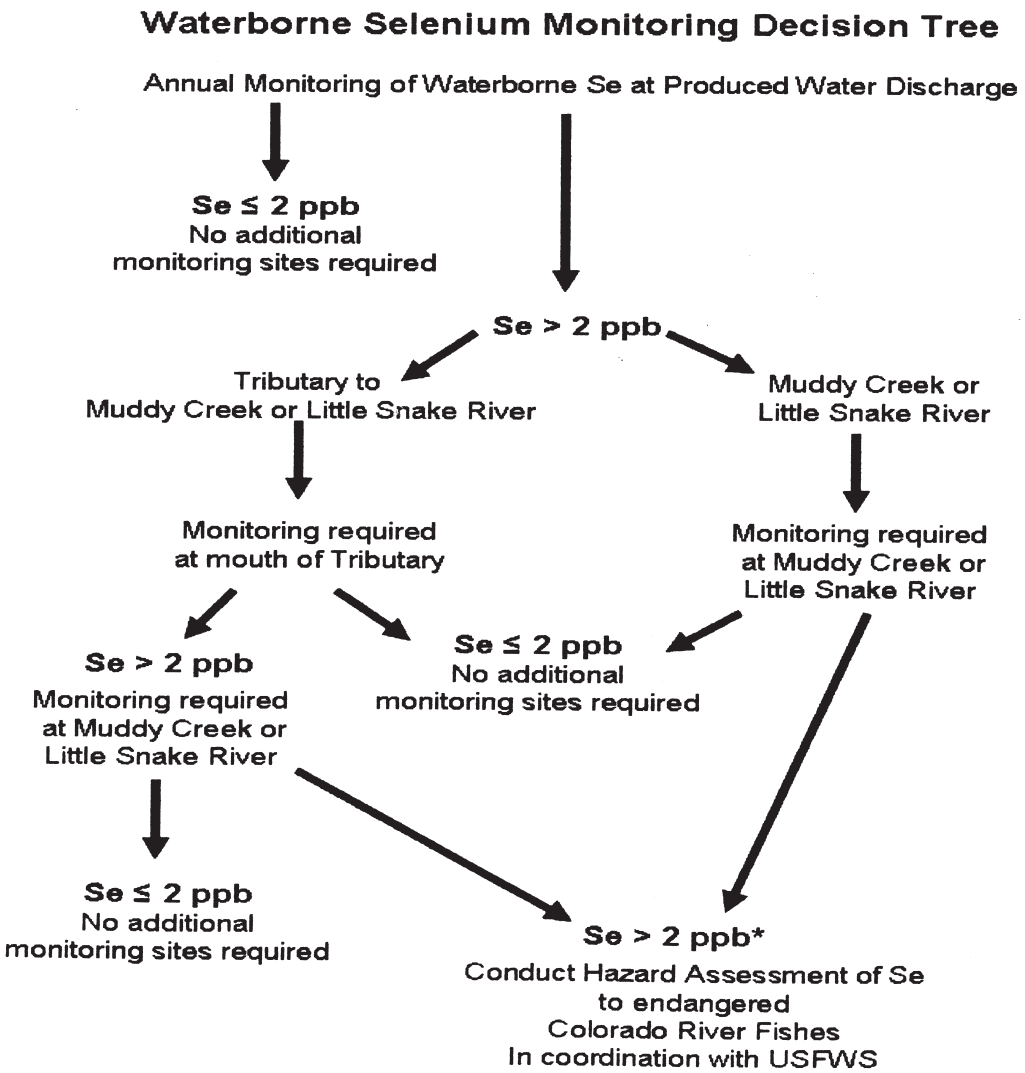
    d) Conduct a hazard assessment appropriate for the size, characteristics, and scale of the individual project in agreement with the U.S. Fish and Wildlife

Service. Hazard assessment analysis would estimate potential impacts to downstream critical habitat for and populations of the endangered Colorado River fishes from selenium and other potentially deleterious water quality constituents.

e) The BLM will require operators to set the selenium detection limit at 1 µg/L. Operators would also be required to submit water quality reports, as required by state Wyoming Pollutant Discharge Elimination System (WYPDES) permits, to the BLM for review as well as to the WDEQ.

f) The BLM will also require monitoring at the end of pipe, as well as other points within the RMPPA downstream of the proposed discharge location. The decision tree outlined in conservation measure (g) will be consulted to determine monitoring locations. If the levels of constituents are above recognized thresholds, appropriate action will be taken to attempt to reduce the levels of these constituents. Appropriate action may include documentation and reporting of the situation to the appropriate enforcement agency or steps taken to reduce the constituent of concern through established mechanisms.

g) Waterborne Selenium Monitoring Decision Tree



*NOTE: If baseline waterborne selenium concentrations in Muddy Creek or the Little Snake River are above 2 µg/L (ppb), then hazard assessment required if Se concentration increases above baseline.