

**PROGRAMMATIC BIOLOGICAL ASSESSMENT FOR  
DEPARTMENT OF ENERGY ACTIVITIES AT THE ROCKY  
FLATS ENVIRONMENTAL TECHNOLOGY SITE**

**PART I: Activities with "No Effect", or that "May Affect, but Not Likely to  
Adversely Affect" threatened or endangered species.**

**January 2004**

**U.S. Department of Energy  
Rocky Flats Field Office  
Golden, Colorado**



**January 2004**

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**Prepared for  
US Department of Energy  
Rocky Flats Field Office  
Golden, Colorado 80402-0464**

**By  
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United States Department of the Interior

*Cliff*

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IN REPLY REFER TO:  
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JAN 30 2004

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Dear Mr. Franklin,

Based on the authority conferred to the U.S. Fish and Wildlife Service (Service) by the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*), we have reviewed the Rocky Flats Programmatic Biological Assessment, Part One with your letter of December 18, 2003, and its effects on the federally-listed Preble's meadow jumping mouse, *Zapus hudsonius preblei* (Preble's). The projects, as proposed, may affect wetlands or other riparian habitats.

Part One of your Programmatic Biological Assessment contains descriptions and locations for groundwater monitoring, soil sampling, surface water monitoring, Building 124 water treatment, Building 891 combined water treatment facility operations, sanitary waste water operations, sanitary waste disposal, routine infrastructure and support activities, utilities deactivation, waste storage and removal, building and structure decommissioning and demolition in the Industrial Area (IA), present landfill, recycling of concrete, IA revegetation, and routine soil remediation projects. Based upon your project descriptions and locations, the Service concurs that these projects will not affect Preble's or its habitat.

Additionally, based on the project information and locations provided on ecological monitoring, air quality monitoring, routine pond operations, routine road maintenance, weed and vegetation management, Well Abandonment and Replacement Program (WARP), removal of concrete pads from abandoned wells, subsurface soil sampling, groundwater treatment system monitoring, trash removal from the Buffer Zone, B-4 Pond building removal, C-1 Pond rip rap pile removal, Walnut Creek dirt pile removal, pipeline removal, fence and t-post removal, gravel and riprap storage area, guard rails along roads, power pole and power line removal, security force Buffer Zone activities, South Interceptor Ditch maintenance, temporary surface water flumes, and Buffer Zone concrete/incinerator removal projects, the Service concurs that these activities are not likely to adversely affect Preble's or its habitat.

Mr. Cliff Franklin

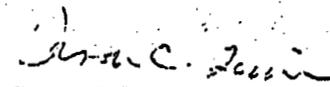
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Duo to changes in scheduling, or in the project design, portions of several projects have already been consulted on separately. The boundary of the Preble's Protection Area was revised in December, 2003, and may now affect some of these projects. Therefore, they have been retained as part of the Programmatic Biological Assessment.

Should any of project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

Should any of your projects not begin within one year of the date of this letter, please contact the Service to discuss any changes in the projects or in site conditions. If the Service can be of further assistance, please contact Amy Thornburg at (303) 966-5777.

Sincerely,

  
Susan C. Linner  
Colorado Field Supervisor

cc: USFWS, Rocky Mountain Arsenal, NWR (Attn: Dean Rundle)  
Kaiser Hill, Rocky Flats (Attn: Andrew Rosenman)  
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Ref: Alison/Rocky Flats/PBS Part One Concurrence/012904

# Contents

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	<u>Page</u>
List of Figures	iv
Acronyms and Abbreviations	v
1. Introduction	1
1.1 Background	1
1.2 Purpose	2
1.3 Assumptions	3
1.4 Responsibilities	3
2. Environmental Setting	4
2.1 Air Quality	4
2.2 Surface Water	4
2.3 Groundwater	5
2.4 Geology	6
2.5 Soils	7
2.6 Ecological Resources	8
2.6.1 Vegetation	8
2.6.2 Wildlife	10
2.7 Species Considered In This Assessment	11
3. No Effect Activities	12
3.1 Routine Activities	14
3.1.1 Monitoring and Routine Maintenance	15
3.1.1.1 Groundwater Monitoring	15
3.1.1.2 Soil Sampling	15
3.1.1.3 Surface Water Monitoring	16
3.1.2 Building 124: Water Treatment Plant	17

3.1.3 Building 891: Combined Water Treatment Facility Operations	17
3.1.4 Sanitary Waste Water Operations	17
3.1.4.1 Disposition Of Incidental Waters	17
3.1.4.2 Disposition Of Internal Waste Water Streams	18
3.1.5 Sanitary Waste Disposal	18
3.1.5.1 Routine Sanitary Waste Disposal	18
3.1.6 Routine Administrative And Infrastructure Support Activities	18
3.1.7 Utilities	18
3.1.8 Waste Storage And Removal	19
3.2 Building And Structure Decommissioning And Demolition	19
3.3 Specific Projects	25
3.3.1 The Present Landfill	25
3.3.2 Recycling Of Concrete From Building Rubble	25
3.3.3 IA Revegetation Activities	26
3.3.4 Routine Soil Remediation	26
4. Activities That May Affect Listed Species, But Are Not Likely To Adversely Affect	27
4.1 Environmental Baseline	33
4.2 Routine Activities	33
4.2.1 Ecological Monitoring	33
4.2.2 Air Quality Monitoring	34
4.2.3 Routine Pond Operations	35
4.2.4 Routine Road Maintenance, Road Repair, Grading, and Mowing	36
4.2.5 Weed And Vegetation Management	36
4.2.6 Well Abandonment And Replacement Program	37
4.2.7 Removal of Concrete Pads from Abandoned Wells	37
4.2.8 Subsurface Soil Sampling	38
4.2.9 Groundwater Treatment System Monitoring	38
4.2.10 Trash Removal From Buffer Zone	39
4.3 Specific Projects	40
4.3.1 B-4 Pond Building	40

4.3.2 C-1 Pond Rip Rap Pile	40
4.3.3 Dirt Pile Along Walnut Creek Southwest Of Landfill	40
4.3.4 Pipeline Removal	40
4.3.5 Fence and T-Post Removal	41
4.3.6 Gravel/Riprap Storage Area	41
4.3.7 Guard Rails Along Roads	42
4.3.8 Power Pole And Power Line Removal	42
4.3.9 Security Force Buffer Zone Activities	42
4.3.10 South Interceptor Ditch Maintenance	43
4.3.11 Temporary Surface Water Flume Projects	43
4.3.12 Buffer Zone Concrete Removal/Incinerator Project	44
5. Activities Not Covered By The PBA	45
5.1 Site Easement Issues	45
5.1.1 McKay Ditch Bypass Monitoring And Maintenance	45
5.1.2 Smart Ditch Bypass Monitoring And Maintenance	45
5.1.3 Mower Ditch Bypass	46
6. Cumulative Effects	47
7. Analysis Of Impacts	49
7.1 Definitions	49
7.2 Findings	50
7.2.1 Preble's Mouse Findings	50
8. Summary	54
9. References	55
Appendix A – Preble's Meadow Jumping Mouse Protection Plan	
Appendix B – Status and Biology of Federally Listed Species	
Appendix C – Historical Correspondence with USFWS	
Appendix D – Federal and State Permits	

## List of Figures

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- Figure 1. Location of the Rocky Flats Environmental Technology Site
- Figure 2. Rocky Flats Environmental Technology Site
- Figure 3. Vegetation Map for the Rocky Flats Environmental Technology Site
- Figure 4. Project Activity Preble's Mouse Impact Determination Flowchart
- Figure 5. Preble's Mouse Current Protection Areas at the Rocky Flats Environmental Technology Site
- Figure 6. Programmatic Biological Assessment Part I Project - 1
- Figure 7. Programmatic Biological Assessment Part I Project - 2

## Acronyms and Abbreviations

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ATV	All Terrain Vehicle
BA	Biological Assessment
BE	Biological Evaluation
BMP	Best Management Practices
BO	Biological Opinion
BZ	Buffer Zone
CDPHE	Colorado Department of Health and Environment
CDNR	Colorado Department of Natural Resources
CDOW	Colorado Division of Wildlife
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CNHP	Colorado Natural Heritage Program
D&D	Decommissioning and demolition
DOE	U.S. Department of Energy
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
GMP	Groundwater Monitoring Program
IA	Industrial Area
ITS	Interceptor Trench System
LHSU	Lower HydroStratigraphic Unit
MOA	Memorandum of Agreement
MSL	Mean Sea Level
MST	Modular Storage Tanks
NPDES	National Pollutant Discharge Elimination System
NREL	National Renewable Energy Lab
OU	Operable Unit
PBA	Programmatic Biological Assessment
PWTS	Process Waste Transfer System
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFNWR	Rocky Flats National Wildlife Refuge
RSOP	RFCA Standard Operating Protocol
SEO	State Engineer's Office
SID	South Interceptor Ditch
Site	Rocky Flats Environmental Technology Site
SPPTP	Solar Pond Plume Treatment Project
TSCA	Toxic Substances Control Act
UHSU	Upper HydroStratigraphic Unit
USCOE	U. S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

WARP  
WWTP

Well Abandonment and Replacement Program  
Waste Water Treatment Plant

# 1. Introduction

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## 1.1 Background

Rocky Flats Environmental Technology Site (Site, RFETS) is an U.S. Department of Energy (DOE) nuclear industrial facility that has been part of the nationwide nuclear weapons complex since 1951. The Site is located in rural Jefferson County, Colorado, approximately 16 miles northwest of Denver, and 5 miles southeast of Boulder (Figure 1). The Site covers approximately 6,300 acres, of which approximately 5,900 acres forms an undeveloped Buffer Zone (BZ) around the central industrialized portion (Industrial Area; IA). The original 1951 land purchase included approximately 2,500 acres of rangeland, which was expanded by an additional 4,030 acres from private ranches between 1974-1976 (some 280 acres were later allocated to the National Renewable Energy Laboratory, NREL). The Site adjoins undeveloped rangelands that are being encroached upon by housing developments on the northeast and southeast. Public open-space lands border the Site to the north, east, and northwest. Sand and gravel mining activities, light industry, and other potential sites for industrial/commercial use are present on the western edge of the Site at a few locations. Jefferson County has zoned approximately 750 acres of the western BZ for surface mining. The Colorado Division of Mines and Geology has issued a reclamation permit for these lands.

The original mission of this DOE facility was the manufacture of nuclear weapons components. After the end of the Cold War, nuclear weapons production was stopped. In 1996, the U.S. Department of Energy, Rocky Flats Field Office (DOE), the Environmental Protection Agency (EPA), and the Colorado Department of Public Health and Environment (CDPHE) executed the Rocky Flats Cleanup Agreement (RFCA). RFCA is the Federal Facility Compliance Agreement and Consent Order negotiated pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), and Colorado Hazardous Waste Act (CHWA). RFCA provides the regulatory framework for attaining the goal to achieve accelerated cleanup and Site closure in a manner that is safe to workers and the public, and protective of the environment. At this time the Site is undergoing cleanup and closure. From now through late 2005, the buildings and other structures at the Site will be decommissioned and demolished, with the disturbed areas seeded with native plant species.

After Site cleanup and closure is completed, the Site will become the Rocky Flats National Wildlife Refuge (RFNWR) to be managed by the U.S. Fish and Wildlife Service (USFWS).

## 1.2 Purpose

The DOE developed this Programmatic Biological Assessment (PBA) as part of the Section 7 consultation requirements of the Endangered Species Act of 1973, as amended (ESA). The DOE is the action agency requesting the formal consultation with the USFWS. This document is Part I of two parts of the PBA that will address the potential for Site activities to affect threatened and endangered species that are protected under the ESA. Part I of the PBA has been prepared to examine impacts from routine, ongoing activities, and specific closure actions that will have either "no effect" or "may affect, but are not likely to adversely affect" on species under consideration in this PBA, which includes the Preble's meadow jumping mouse (Preble's mouse; *Zapus hudsonius preblei*) and its habitat (current protection areas). The current Preble's protection areas at the Site are defined as those areas delineated by the *Preble's Meadow Jumping Mouse Protection Plan* for the Site (DOE 2000; see Appendix A in Part I of the PBA for the Plan and the map). This plan was required under the Memorandum of Agreement (MOA, February 26, 1999) signed between DOE, USFWS, U.S. Environmental Protection Agency (EPA), Colorado Department of Public Health and Environment (CDPHE), and the Colorado Department of Natural Resources (CDNR). The plan was developed based on several years of Preble's mouse trapping, telemetry, and habitat characterization work at the Site. The plan has been submitted several times to the USFWS for concurrence, however, the USFWS has never concurred. Although the plan has never received formal concurrence, it has been cited and used for numerous Biological Assessments (BAs), Biological Evaluations (BEs), and Biological Opinions (BOs) for Site projects. Part II of the PBA addresses actions that "are likely to adversely affect" the species under consideration in this PBA including the Preble's mouse and its habitat (current protection areas). Part II of the PBA also addresses water depletion issues.

There will be no effect from any of the activities listed in Part I of the PBA on the species evaluated, with the exception of the Preble's mouse. Although some activities listed in Part I of the PBA may affect the Preble's mouse, it is unlikely that these activities will adversely affect it.

Unlike most other Section 7 consultations, the DOE activities covered under this PBA are aimed at removing man-made structures in and adjacent to the habitat of the Preble's mouse and re-establishing the native vegetation. This large-scale project differs from most other consultations where private and public agencies are consulting about activities that have permanent impact on the habitat of federally listed species (i.e., residential and commercial development, roads, parking lots, etc.). Instead of encroaching permanently into the Preble's mouse habitat, this project will re-establish and increase the amount of habitat at the Site while largely having only temporary impacts. Thus the long-term benefits will far outweigh the short-term impacts. Because the Site will become a national wildlife refuge these resource values will be protected for future generations.

### **1.3 Assumptions**

This PBA addresses all the potential activities that may occur at the Site through closure that may affect threatened and endangered species, with specific emphasis on the Preble's mouse. However, the fact that a project is listed in this document does not mean that it will necessarily take place. Only projects that are conducted will be mitigated as discussed in the PBA. Mitigation will not occur for projects that are not conducted. The objective of the PBA is to identify all potential projects for the consultation process so that no delays in project schedules will occur. Where specific project plans are not available, the worst case scenarios have been assumed. The projects activities are required to meet regulatory requirements or site closure commitments.

### **1.4 Responsibilities**

Project managers will receive a copy of the PBA and BO, and be briefed on the guidelines and requirements contained therein pertinent to their project. The project managers are responsible to ensure compliance with the requirements and guidelines outlined in the PBA and BO. Projects are responsible to follow and maintain the best management practices (BMPs).

## **2. Environmental Setting**

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### **2.1 Air Quality**

Air quality is generally better at the Site than in the urbanized portion of the Denver Metropolitan Area; air emissions are within permitted limits for regulated air pollutants. The principal point sources of criteria pollutants at the Site have been the steam plant boilers. Minor combustion sources include smaller boilers and emergency generators. Fugitive dust is one of the more significant air pollutants at the Site; cleanup and related construction can require dust suppression to control fugitive dust.

Radiological air emissions both on- and off-Site are largely unrelated to Site operations. Most radiation is naturally occurring background radiation from sources such as radon. The annual background dose for Denver area residents is about 418 mrem (more than 1 mrem per day). Radioactive emissions from the Site are principally from contaminated soil, with an annual dose for the nearest most impacted off-Site resident of about 0.1 mrem. Facilities with potential radionuclide emissions are continuously monitored at emission points to ensure that emissions are properly controlled and comply with regulations.

### **2.2 Surface Water**

The Site is situated within the headwaters of two regional drainage basins, Boulder Creek basin and Big Dry Creek basin. Within these basins, three intermittent systems, Walnut Creek, Woman Creek, and Rock Creek, drain the Site (Figure 2).

Walnut Creek is an east-flowing stream that drains the central portion of the Site, including most of the IA. Runoff from the developed area to the drainage occurs faster and with greater volume than under natural conditions. Within Site boundaries, Walnut Creek includes three major branches on-Site, South Walnut Creek, North Walnut Creek, and a northern tributary referred to as the "unnamed tributary." These tributaries converge in the eastern portion of the Site. The North Walnut Creek drainage includes a series of four detention ponds (A-series ponds), constructed for Site runoff control and pollution prevention programs. The South Walnut Creek runoff is controlled through a series of five in-channel detention ponds (B-series ponds).

Walnut Creek is generally dry from July through April based on natural flows, however, it does receive water from pond discharges throughout the year. Pond discharges occur on the average ten times per year and last about fourteen days per discharge.

The Woman Creek drainage is located south of the IA, and includes an area from the Boulder Diversion Canal west of the Site to Indiana Street. The three sources of flow to Woman Creek are precipitation and surface runoff, seepage from Antelope Springs and

lesser seeps, and conveyance flows as a result of water rights agreements. These flows are from Kinnear Ditch, Smart Ditch #1, and Smart Ditch #2.

Woman Creek flows through Pond C-1, and is then diverted around Pond C-2 by the Woman Creek Bypass Canal. Woman Creek flows are either diverted into the Mower Diversion Ditch or proceed in Woman Creek to Indiana Street and off-Site.

Surface water runoff from the southern slope of the IA is collected by the South Interceptor Ditch and conveyed to Pond C-2. Water impounded in Pond C-2 is held for quality analysis, and discharged into Woman Creek below the dam.

Rock Creek is located in the northern portion of the Buffer Zone. It is upstream of the IA, and it is physically separated from the IA by a northeast trending ridge. It was undisturbed by Site activities during operation of the Rocky Flats Plant. Rock Creek is now part of the Rock Creek Preserve, a part of the Site property that is co-managed by DOE and the USFWS. Rock Creek flows off-Site into Coal Creek.

### **2.3 Groundwater**

The Site is located in a regional groundwater recharge area. Recharge occurs primarily from the infiltration of precipitation. Groundwater recharge also occurs from infiltration from stream, ditch, and pond seepage.

Shallow groundwater flow at the Site generally follows the topography of the bedrock surface. Groundwater in the ridge tops generally flows toward the east-northeast. In areas where the ridge tops are dissected by east-northeast trending stream drainages, groundwater flows to the north or south toward the bottom of the valleys. In the valley bottoms, groundwater flows to the east, generally following the course of the stream. Shallow groundwater flow is primarily lateral due to the low permeability of the underlying claystone bedrock.

Two non-hydraulically connected groundwater systems are present at Rocky Flats. The upper unit exists as an unconfined aquifer and the lower unit as a confined aquifer. Aquifer recharge occurs through direct infiltration or percolation, infiltration from surface water when the water table lies below a stream or canal, inter-aquifer leakage, and infiltration from artificial sources, such as detention ponds, surface water impoundment, sewer lines, and dry wells.

The uppermost aquifer or upper hydrostratigraphic unit (UHSU) consists of the unconfined saturated zone, in which unconsolidated and consolidated groundwater-bearing strata are in hydraulic communication. The UHSU consists of Rocky Flats Alluvium, valley-fill alluvium, colluvium, landslide deposits, weathered Arapahoe and Laramie Formation bedrock, and sandstones within the Arapahoe and upper Laramie Formations in hydraulic communication with the overlying unconsolidated surficial deposits. The UHSU exhibits a wide range of hydraulic conductivity, but generally has a

relatively low to moderate hydraulic conductivity. The lower hydrostratigraphic unit (LHSU) consists of the consolidated, unweathered bedrock zone of the Arapahoe and upper Laramie Formations. These formations have less sandstone and more claystones that create an aquitard restricting hydraulic communication with the UHSU. The lower Laramie and Fox Hills Formations comprise a third hydrostratigraphic unit.

The three hydrostratigraphic units are hydraulically separated beneath the IA. The units are thought to converge near the western edge of the Site due to monoclinial folding and erosional proximity.

## 2.4 Geology

The Site is located along the western margin of the Denver Basin, an asymmetric basin with a steeply east-dipping western flank and a gentle eastern flank. The elevation at the Site is about 6,000 feet above mean sea level (msl), and the upper surface of the alluvium slopes easterly one to two degrees. A monoclinial fold limb exposed west of the Site is the most significant surficial structural feature. Along the west limb of the fold, an angular unconformity exists between the Upper Cretaceous bedrock and the base of the Quaternary Rocky Flats Alluvium.

The stratigraphic sequence that underlies the Site extends from the crystalline Precambrian gneiss, schist, and granitoids at 3,000 feet below msl to the unconsolidated Quaternary deposits at surface about 6,000 feet above msl. Bedrock formations from the uppermost Cretaceous Pierre, Fox Hills, Laramie, and Arapahoe Formations are present at the surface and beneath the Site. The Quaternary Rocky Flats Alluvium and Verdos Alluvium unconformably overlie the Cretaceous Arapahoe and Laramie Formations in the central portion of the Site. The unconsolidated surficial deposits, combined with the weathered portion of subcropping bedrock formations, form the sequence of rocks which have the greatest importance regarding groundwater flow at the Site.

Several Quaternary alluvial formation pediment covers have been identified in the vicinity of the Site. The Rocky Flats Alluvium is an unconsolidated deposit derived from quartzites and granites of the Coal Creek Canyon provenance west of the Site. The deposit diminishes from west to east with a thickness ranging from about 100 feet to less than one foot. In the central portion of the Site, the deposit is about 15 to 25 feet thick. The Rocky Flats Alluvium is a heterogeneous deposit dominantly composed of angular to subrounded, poorly-sorted, coarse, bouldery-gravel with a clay and sand matrix. Clay, silt, and sand lenses as well as varying amounts of caliche are also present.

In addition to the pediment-forming alluvial deposits, younger Quaternary units consisting of colluvium, landslide alluvium, and valley fill alluvium mantle the hillslopes and valley bottoms below the pediment surface. Colluvial deposits are derived from Arapahoe and Laramie Formations and older alluvial deposits. These units consist of 3 to 16 feet of sheetwash, soil creep, and landslide materials. These deposits locally flank the

Rocky Flats Alluvium, and generally extend to lower parts of the slopes along the principal drainages.

Landslide deposits more commonly flank the Rocky Flats Alluvium. The deposits are often bounded by headwall scarps and lobate toes at the downslope margins. Seeps issuing from the base of the Rocky Flats Alluvium contribute to landslide colluvium generation. The landslide units include earth flows, slumps, and debris flows in a thickness estimated between 10 to 33 feet.

The Arapahoe Formation is composed of claystones and silty claystones with some lenticular sandstone, and is generally less than 25 feet thick at the Site. The basal Arapahoe Sandstone is of concern as a potential contamination pathway, especially where it subcrops beneath the alluvial/bedrock unconformity.

The Laramie Formation is about 600 to 800 feet thick, and is composed of a lower sandstone/claystone/coal interval and an upper, thicker claystone interval. The permeable lower sandstones and coals of the Laramie, combined with the permeable sandstones of the Fox Hills, constitute a regional aquifer system known as the Laramie-Fox Hills aquifer. This aquifer system is an important water source in the South Platte River Basin, and is the sole water supply for some residents in the surrounding area. The Fox Hills Formation is primarily a fine-grained sandstone that is about 75 to 125 feet thick with thin siltstone and claystone interbeds. The Fox Hills Formation outcrops and subcrops along a narrow, north-south trending pattern in the extreme western part of the Site. The Pierre Formation is a 7,500-foot thick, dark gray, silty bentonitic shale that acts as a lower confining layer for the Laramie-Fox Hills aquifer in the Denver Basin. This thick marine shale unit subcrops only in the extreme western part of the Site.

## 2.5 Soils

Soils in the western and eastern portions of the Site are distinctly different. Most soils are alluvial (stream-deposited), colluvial (gravity-deposited), or exposed bedrock material. Soil textures are predominantly loamy, with varying amounts of clay, sand, gravel, and cobbles.

The prevalent soil types on the western side of the Site are Flatirons (very cobbly to very stony sandy loams), and Nederland (very cobbly, very sandy loam). Flatirons soils exhibit low permeability, slow runoff, and slight erosion characteristics. Nederland soils are moderately permeable, and exhibit rapid runoff and severe water erosion (on steep slopes) characteristics.

Soils on the eastern side of the Site include Denver-Kutch-Midway clay loams that exhibit low permeability, rapid runoff, and low to moderate wind erosion and severe water erosion characteristics, Valmont clay loam that exhibits low permeability, slow runoff, and moderate wind erosion and low water erosion characteristics, Haverson loam that has moderately slow permeability, slow runoff, moderate wind erosion and slight

water erosion characteristics, and Nunn clay loam that has low permeability, slow to medium runoff, slight to moderate wind erosion and slight to moderate water erosion characteristics.

## 2.6 Ecological Resources

### 2.6.1 Vegetation

The uniqueness and diversity of the plant communities at Site has been documented by a number of studies (K-H 1997a, 1997b, 1998a, 1999a, 2000a, 2001a, 2002a). The topography and close proximity of the Site to the mountains has resulted in an interesting mixture of prairie and foothills plant communities at the Site. Currently 600 species of plants are reported for the Site. No threatened or endangered plant species are known to occur at the Site. Plant communities at the Site range from xeric (dry) grassland communities to more hydric (wet) communities such as wet meadows and marshes (Figure 3).

The plant communities of greatest ecological significance on Site are the xeric tallgrass prairie, the Great Plains riparian community, the tall upland shrubland community, and wetlands. The xeric tallgrass prairie occurs on the cobbly alluvium found on pediments (flat upland areas) and ridges at the Site. This prairie is distinguished by such tallgrass plant species as big bluestem (*Andropogon gerardii*), little bluestem (*Andropogon scoparius*), prairie dropseed (*Sporobolus heterolepis*), and switchgrass (*Panicum virgatum*). These species are common and abundant in the tallgrass prairies hundreds of miles to the east of the Front Range, but their presence here is rare. Big bluestem and little bluestem are the most abundant of these prairie species found at the Site with the others occurring less commonly. In addition, common montane or foothills species such as mountain muhly (*Muhlenbergia montana*), Fendler's sandwort (*Arenaria fendleri*), and Porter's aster (*Aster porteri*), also occur in the tallgrass prairie at the Site. These latter species are indicative of the unique mixing of mountain and prairie species found at the Site. The xeric tallgrass prairie was once a more common grassland along the Front Range, extending in a narrow band along the mountain front from Colorado Springs to the Wyoming border. As with many of the ecosystems along the Front Range, development, mining, overgrazing, and other human activities have destroyed the xeric tallgrass prairie. The Colorado Natural Heritage Program (CNHP) lists the xeric tallgrass prairie at the Site as the largest known remnant in Colorado and possibly North America. Because of this rarity, the CNHP has classified this plant community as very rare and susceptible to becoming endangered. The presence of breeding populations of the grasshopper sparrow, itself only known to occur in just over 100 locations in Colorado, and the presence of the State rare butterfly, the argos skipper, in the xeric tallgrass prairie on Site, are further indicators of the quality and special nature of the prairie at the Site.

The Great Plains riparian community, mapped at the Site as riparian (stream channel) woodland and shrubland, is found along streams at the Site. Examples of this community are found in the Rock Creek, Walnut Creek, Woman Creek, and Smart Ditch drainages. Plains cottonwood (*Populus deltoides*), coyote willow (*Salix exigua*), and peach leaf

willow (*Salix amygdaloides*) predominate in this community. Another unusual shrub community, dominated by leadplant (*Amorpha fruticosa*), is also often found in association with the Great Plains riparian community at the Site. Often found in association with the riparian community is the short upland shrubland which is dominated by snowberry (*Symphoricarpos occidentalis*) and Arkansas rose (*Rosa arkansana*). These communities provide important habitat for many of the bird and mammal species found here, including the Preble's meadow jumping mouse.

The tall upland shrubland community is found on north-facing slopes primarily in the Rock Creek drainage. This community commonly occurs just above wetlands and seeps. The dominant tall shrubs are choke cherry (*Prunus virginiana*), hawthorn (*Crataegus erythropoda*), and American plum (*Prunus americana*). Other common species in the tall upland shrubland are typical of the foothills to the west of the Site. It has been identified by the CNHP as a potentially unique shrubland community, possibly not occurring anywhere else. This community is used by many animals throughout the year for cover and is used during the spring by mule deer as fawning areas. Several rare bird species also inhabit this community during the breeding season.

The mesic mixed grassland is a mixed grass prairie community common on the hillsides at the Site. This community covers the largest amount of area at the Site and is dominated by western wheatgrass (*Agropyron smithii*) and blue grama grass (*Bouteloua gracilis*), with green needle grass (*Stipa viridula*), purple three-awn (*Aristida purpurea* ssp. *robusta*), and buffalo grass (*Buchloe dactyloides*) occurring commonly.

The U.S. Army Corps of Engineers (USCOE) delineated 1,097 separate wetlands at the Site in 1994 (USCOE, 1994). These areas occupy about 190 acres along the three drainage basins within the Site. The wetlands can be segregated into stream bottom wetlands and slope wetlands.

Stream bottom wetlands (palustrine wetlands associated with stream channels) are the most common type of wetland at the Site. Stream bottom wetlands account for 73% of the total number of wetlands and 65% of the total wetlands area. Stream bottom wetlands at the Site include *Forested wetlands*, *Scrub-shrub wetlands*, and *Herbaceous emergent wetlands*.

Slope area wetlands are found where ground water is discharged along hillsides between the alluvial cap and the underlying consolidated material. Although the seeps are fed by shallow aquifers, the discharge is sufficiently persistent to support well-developed stands of wetland vegetation. Slope area wetlands include *saturated, seasonal and temporary wetlands*. Saturated wetlands are located at the point of discharge of a seep and are characterized by persistent soil saturation and a short marsh vegetation type. Seasonal wetlands that are typically located farther from the water source than saturated wetlands and are consistently saturated only during periods of high discharge and are characterized by a wet meadow vegetation type. Temporary wetlands are located at the perimeter of

saturated or seasonal wetlands and are characterized by a wet meadow community type or a mesic mixed grassland type.

Stream bottom wetlands include 800 locations covering 123 acres. The Rock Creek drainage basin includes 161 wetlands covering 25 acres, the Woman Creek drainage basin includes 339 wetlands covering 58 acres, and the Walnut Creek drainage basin includes 300 wetlands covering 40 acres.

Slope area wetlands include 297 locations covering 67 acres. The Rock Creek drainage basin includes 152 wetlands covering 32 acres, the Woman Creek drainage basin includes 102 wetlands covering 27 acres, and the Walnut Creek drainage basin includes 43 wetlands covering 8 acres.

### **2.6.2 Wildlife**

A considerable diversity of wildlife occurs at the Site. A brief discussion follows of the various groups of wildlife found at the Site.

Birds occur in all available habitats at the Site. The most common raptors at the Site year-round are red-tailed hawks, American kestrels, great horned owls, and northern harriers. In summer, the most common additional species are Swainson's hawks, golden eagles, and turkey vultures. Other species that occasionally visit the Site include the bald eagle, peregrine falcon, ferruginous hawk, and burrowing owl. Among more than 45 species of waterfowl and shorebirds at the Site, mallards, Canada geese, and great blue herons are the most common. Other frequently observed waterfowl species include buffleheads, blue-winged teal, green-winged teal, common and hooded mergansers, ring-necked ducks, redheads, and lesser scaups. Several waterfowl and shorebirds breed at the Site. Over 95 neo-tropical migrant species have been recorded at the Site, several of which have been confirmed as breeding in a variety of habitats. Common neo-tropical migrant species observed at the Site include the Say's phoebe, eastern and western kingbirds, cliff and barn swallows, American robins, yellow warblers, common yellowthroat, grasshopper sparrows, vesper sparrows, red-winged blackbirds, and western meadowlarks.

Mule deer are common across the Site with an occasional white-tailed deer mixed in the population. Deer population numbers range between 100 and 160 on an annual basis at the Site. In recent years, elk and black bear have been observed occasionally in the BZ at the Site. The most commonly observed carnivore is the coyote. Several active coyote dens are present at the Site each year. Mid to small sized animals include desert cottontails, white-tailed and black-tailed jackrabbits, raccoons, muskrats, and black-tailed prairie dogs.

Amphibians and reptiles can be observed across the Site in the appropriate habitats for each species. Common species include the prairie rattlesnake, boreal chorus frogs, northern leopard frogs, western painted turtles, and bullfrogs. Occasionally the eastern

short-horned lizard can be observed on the xeric tallgrass prairie. Fish can be found in the intermittent streams and most ponds at the Site. Common species include fathead minnows, creek chubs, and an occasional small-mouth and large-mouth bass.

## 2.7 Species Considered In This Assessment

Based on a species list received from the USFWS the following species have been evaluated as part of this PBA. Species descriptions are presented in Part I, Appendix B.

<b>Animals</b>	<b>Legal Status</b>
American burying beetle ( <i>Nicrophorus americanus</i> )*	LE
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	LT
Black-footed ferret ( <i>Mustela nigripes</i> )	LE
Black-tailed prairie dog ( <i>Cynomys ludovicianus</i> )	C
Boreal toad ( <i>Bufo boreas boreas</i> )	C
Canada lynx ( <i>Lynx canadensis</i> )	LT
Eskimo curlew ( <i>Numenius borealis</i> )*	LE
Greenback cutthroat trout ( <i>Oncorhynchus clarki stomias</i> )	LT
Least tern ( <i>Sterna antillarum</i> )*	LE
Mexican spotted owl ( <i>Strix occidentalis lucida</i> )	LT
Mountain plover ( <i>Charadrius montanus</i> )	PT
Pallid sturgeon ( <i>Scaphirhynchus albus</i> )*	LT
Pawnee montane skipper ( <i>Hesperia leonardus montana</i> )	LT
Piping plover ( <i>Charadrius melodus</i> )*	LT
Preble's meadow jumping mouse ( <i>Zapus hudsonius preblei</i> )	LT
Whooping crane ( <i>Grus americana</i> )*	LE
<b>Plants</b>	
Colorado butterfly plant ( <i>Gaura neomexicana coloradensis</i> )	LT
Ute ladies'-tresses orchid ( <i>Spiranthes diluvialis</i> )	LT
Western prairie fringed orchid ( <i>Platanthera praeclara</i> )*	LT

\* = Lower Platte River species

C = Candidate for listing

LT = Listed threatened

LE = Listed endangered

PT = Proposed threatened

### 3. No Effect Activities

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This section of Part I of the PBA outlines various Site activities that will have no effect on listed species or their habitat. Additional or unforeseen future projects that are not listed in this section will be evaluated based on the following criteria to determine whether they meet the “no effect” definition. If projects meet the “no effect” criteria then no further consultation with the USFWS will be pursued. If projects do not meet the “no effect” criteria, then further evaluation will be conducted to determine whether they meet the “may affect, but not likely to adversely affect” or “adverse effect” criteria. Evaluations will include an assessment of potential direct and indirect effects, interdependent actions, cumulative effects (effects from state and private party actions), and interrelated actions. Projects described in this section, along with any indirect effects, interdependent actions, and interrelated actions, were deemed to have no effect on any listed species, specifically the Preble’s mouse, for the following reasons (the flowchart in Figure 4 summarizes the following criteria and allows for easier determination of project activity effects):

- The majority of these activities are not located within the current Preble’s protection area (see Section 1.2 of Part I of the PBA for the definition of the current Preble’s protection areas; [Figure 5; map in Appendix A of Part I of PBA]).
- Only temporary disturbance to the Preble’s habitat will result from these activities (such as trampling of vegetation). No permanent loss of habitat will occur.
- Vegetation will not be removed or damaged during these activities within the current Preble’s protection areas.
- Soil disturbance is very minimal (< 0.5 sq. ft. per action) in the current Preble’s protection areas.
- For projects located within the current Preble’s protection areas, activities will be conducted on foot or using established roads and two-tracks.
- No heavy equipment (i.e., front end loaders, track hoes, back hoes, etc.) are necessary to conduct the activities when in the current Preble’s protection area.
- The majority of the projects listed in this section of the PBA are scattered throughout the BZ and are not concentrated or contiguous at a given location. Therefore the potential for impacts are minimal because suitable habitat exists adjacent to project areas.
- Due to the fact that most of the activities listed in this section do not take place in or directly adjacent to Preble’s habitat, and that the activities that may take place in Preble’s habitat are very low impact (see reasons above), no cumulative, additive, direct or indirect effects, interdependent actions, or interrelated actions are expected to occur. Examples of these types of impacts to evaluate might include sedimentation and erosion potential, changes in water flows, or noise concerns. See further discussion of this issue in the Analysis of Impacts section of Part I of the PBA.

To minimize impacts to the Preble's mouse, project management will utilize and maintain the following best management practices (BMPs) except where regulatory and/or health and safety requirements take precedence:

- Identify and prioritize Preble's habitat areas that are subject to disturbance and design activities to avoid areas of high habitat value<sup>1</sup>. For example, large willow patches should be avoided.
- Reduce the impact footprint (i.e., no excessive walking in area beyond what is necessary to accomplish the work, minimizing laydown area and equipment storage locations).
- Conduct all activities during daylight hours, when the Preble's mouse is less active when scheduling during the hibernation season of the mouse cannot be accomplished.
- Minimize the length of time spent in sensitive areas (getting work done as quickly as possible, not reentering area once work is completed).
- Use established roads (i.e. paved, gravel, two-track, historically used routes to monitoring locations) for vehicle traffic.
- Remove trash and unnecessary equipment in project areas after work is completed.
- Revegetate disturbed Preble's habitat with native species after the activity has been completed in accordance with the Habitat Mitigation Techniques Plan (Appendix A, Part II of PBA).
- Prevent spilled fuels, lubricants or other toxic materials from entering Preble's habitat.
- Minimize project activities in wet areas and conditions to avoid damage to the habitat.
- The projects contained in this section of the PBA are not expected to result in erosion or sedimentation problems with perhaps the exception of the building and structure decommissioning and demolition in the IA and IA revegetation (areas outside of Preble's habitat). The building decommissioning and demolition in the IA and the IA revegetation activities will use appropriate erosion and sediment control BMPs.
- Inspect and clean equipment of weeds/seed to prevent spread of noxious weeds.

Project managers will receive a copy of the PBA and BO, and be briefed on the guidelines and requirements contained therein pertinent to their project. Project management is responsible to ensure compliance with the requirements and guidelines outlined in the PBA and BO. Projects are responsible to follow and maintain the best management practices (BMPs).

The following table lists the activities included in the "no effect" section of the PBA. The table summarizes the potential project impacts within the current Preble's protection

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<sup>1</sup> For determination of impacts within current Preble's protection areas, habitat quality was defined based on the 1996 Site vegetation map. Higher quality habitat is defined as all woody vegetation classifications and short marsh, tall marsh, and wet meadow wetland types. Lower quality habitat is defined as all grassland classifications, mud flats, and other disturbed community types. Open water, riprap, concrete, roads, structures are not considered habitat for the Preble's mouse.

areas. Additional detail on each project is found following the table. Figures 6 and 7 show the locations of some of these projects. Project evaluations are based on worst case scenarios, except where specific plans or information currently exists. The activities included in this section are being consulted on because they are likely to happen. Their inclusion here, however, does not constitute the fact that they will indeed occur. Human impacts are defined as human foot traffic in an area. Vegetation/soil impacts are defined as activities that in some way disturb vegetation or soil beyond that associated with foot traffic in an area.

Project	Preble's Mouse Habitat Potential Impacts	
	Human Impacts*	Vegetation/Soil Impacts*
Groundwater Monitoring	Foot traffic, quarterly, approximately 45 wells, 1 to 2 hours per well.	None
Soil Sampling	Foot traffic, ½ hour per location	Typically <12 per year, <0.5 sq ft per sample
Surface Water Monitoring	Foot traffic, 12 locations, 3X/Month.	None
Building 124: Water Treatment Plant	None	None
Building 891: Combined Water Treatment Facility Operations	None	None
Sanitary Waste Water Operations	None	None
Sanitary Waste Disposal	None	None
Routine Administrative And Infrastructure Support Activities	None	None
Utilities	None	None
Waste Storage And Removal	None	None
Building And Structure Decommissioning And Demolition in IA	None	None
The Present Landfill	None	None
Recycling Of Concrete From Building Rubble	None	None
IA Revegetation Activities	None	None
Routine Soil Remediation	None	None

\* Impacts are estimated and are not exact numbers.

### 3.1 Routine Activities

This section describes ongoing routine activities that take place at the Site that have no effect on the species under evaluation in this PBA. The majority of these activities have

been ongoing for more than a decade, and many have been ongoing since the Site was first activated more than 50 years ago.

### **3.1.1 Monitoring and Routine Maintenance**

#### **3.1.1.1 Groundwater Monitoring**

The Groundwater Monitoring Program (GMP) consists of groundwater monitoring, compliance reporting, evaluation of groundwater exceedances of Rocky Flats Cleanup Agreement (RFCA) Action Levels, and maintenance of the Site monitoring well network. Monitoring includes groundwater sample collection, water level measurements, sample and data management, and well development and abandonment. The well development and well abandonment and removal program components of the groundwater program are addressed later in Part I of the PBA under the section dealing with "May Affect, But Unlikely To Adversely Affect" activities.

The groundwater monitoring network includes wells that are sampled for water quality and water levels. The monitoring program consists of water quality sample collection, well development, water level measurements, field parameter measurements, sample management, and data management done on a quarterly basis. At times, the program may cover special sampling, well development and water level measurements, aquifer testing, and special reporting. These latter activities, if conducted, would require an additional visit to a well occasionally and the addition of some small monitoring equipment that would be attached to the well head. The monitoring wells are scattered throughout the BZ and approximately 45 are found within the current Preble's protection areas. These activities would not disturb habitat, other than the drive to the well, which occurs along preexisting roads [i.e., two track roads, historical routes to the monitoring wells]. Piezometer wells in Preble's mouse habitat are accessed on foot, and the activity at the well is limited to taking a water level measurement. At the larger wells, samples are collected, requiring longer stays (about one to two hours) at the location. These short-duration visits (a few hours per visit) are conducted once every three months, and even where adjacent to or within Preble's mouse habitat, are nonintrusive activities. Established roads will be used for all vehicle traffic, activities will be performed during daylight hours, and no vegetation will be cut. Therefore, activities under this project will have no effect on the Preble's mouse. The USFWS concurred with this project in a previous draft of the PBA (USFWS 2000; concurrence letter in Part I, Appendix C).

#### **3.1.1.2 Soil Sampling**

Soil sampling is conducted frequently at the Site to characterize an area for potential contaminants. Most of this sampling takes place in disturbed areas where the potential for contaminants exists. In Preble's habitat, off-road sampling would be conducted on foot. Samples are typically taken with hand tools and consist of scraping the top inch or two of soil from a small area, generally less than one square foot. Hundreds of samples are taken each year across the Site with less than a dozen or so typically occurring in current Preble's protection area. Soil sampling has been conducted across the Site for the

past 50 years with no apparent effects to the Preble's mouse, Preble's habitat or other listed species under consideration. Trapping data from each of the drainages show mice continue to be captured where they have been trapped before. Telemetry data from the Site have shown the mice continue to move up and down the stream drainages with no apparent impacts. Habitat characterization data shows no effects to the vegetation resulting from any soil sampling efforts (DOE 1996, K-H 1998b, 1999b, 2000b, 2001b, 2002b). Thus no effect to the Preble's mouse is expected from this activity. Subsurface soil sampling is discussed in section 4.2.8 of Part I of the PBA.

### **3.1.1.3 Surface Water Monitoring**

Routine activities include sampling and tracking; analytical data screening and quality determinations; and preparation, implementation, and maintenance of management controls (e.g., procedures, plans, schedules). Surface water sampling includes monthly monitoring of surface water effluent from the Site's Waste Water Treatment Plant (WWTP; one composite sample for one week per month) and pre-discharge sampling and analysis to ensure that Site surface water discharges meet water quality standards. Pre-discharge sampling consists of collecting grab samples from ponds that will be discharged, prior to the discharge, approximately every two months, or as pond levels dictate. Ponds are accessed via routinely maintained, improved gravel roads.

Other monitoring includes operation of an automated monitoring network for water sample collection; installation, testing, and operation of water quality probes; and flow monitoring at surface water sampling locations. Flow data are monitored continuously via radio telemetry and reported per the regulatory requirements of the National Pollutant Discharge Elimination System (NPDES) Permit and RFCA.

Monitoring stations measure water flow and sample surface water for water quality. The stations are visited two to three times weekly, depending on flow conditions. During high-runoff periods, the stations may be visited daily. The sample stations are accessible by existing roads, and vehicular travel is restricted to these roads. Some sample locations are located in Preble's mouse habitat, but the sampling activity is nonintrusive, consisting of a technician driving to the sample location, walking from the road to the sampler, checking equipment, exchanging full sample bottles for empty ones, and departing from the location. This activity is done during the daytime when Preble's mice are normally less active. Water samples consist of five-gallon samples collected over several days, weeks, or months. Collection of such a small volume of water produces a negligible effect on downstream flow.

Additional monitoring is done around buildings that are undergoing or scheduled for decommissioning. Small monitoring installations may be placed as close as possible to the building or building cluster prior to the start of demolition. These installations take advantage of existing drainage ditches, culverts, or other stormwater runways in areas adjacent to the buildings. The USFWS concurred with this surface water monitoring in a previous draft of the PBA (USFWS 2000; concurrence letter in Part I, Appendix C).

Installation of temporary surface water monitoring flumes is addressed later in Part I of the PBA under the section dealing with activities that may affect, but are unlikely to adversely affect the Preble's mouse.

### **3.1.2 Building 124: Water Treatment Plant**

The Water Treatment Plant processes raw water to provide potable water to all Site facilities. The Water Treatment Plant treats an average of 300,000 gallons of raw water per day for human consumption, fire protection, and other uses. This water is purchased from the Denver Water Board, and does not come from Site surface waters.

Decommissioning and demolition (D&D) of the water treatment plant will have no effect on any listed species because the plant buildings are located in the IA. Water depletion issues will be discussed in Part II of this PBA.

### **3.1.3 Building 891: Combined Water Treatment Facility Operations**

This activity includes the Building 891 daily operations and maintenance, including sampling, operations, transportation, reporting, and water collection/transfer in support of the treatment facility and environmental restoration projects. At present, Building 891 processes and treats various Site waters. These waters are discharged into the South Interceptor Ditch after treatment. Building 891 will continue to operate in accordance with the agency agreements, with the primary goal of treating liquid wastes. Generally, wastes treated include decontamination water and incidental water from environmental restoration projects. Because this activity transfers, but does not deplete waters within the IA, no effect to listed species onsite or off-Site is expected. The USFWS concurred with this project in a previous draft of the PBA (USFWS 2000; concurrence letter in Part I, Appendix C).

D&D of Building 891 will not affect the Preble's mouse because it is not in current Preble's protection areas.

### **3.1.4 Sanitary Waste Water Operations**

#### **3.1.4.1 Disposition Of Incidental Waters**

This activity involves coordinating the sampling and disposition of about 130 incidental waters that accumulates (e.g. water that accumulates in utility pits, valve vaults, secondary containment, and excavation pits) per year. Site Procedure 1-C91-EPR-SW.01 addresses the control and disposition of incidental water at the Site. A determination is made as to whether the water is to be discharged to the ground as clean surface water, sent to the WWTP, or transferred to another Site treatment facility. This activity is necessary to prevent water discharges that could result in non-compliance with RFCA surface water standards. Because this activity transfers but does not deplete waters within the industrialized area, no effect to listed species onsite or off-Site is expected. The

USFWS concurred with this project in a previous draft of the PBA (USFWS 2000; concurrence letter in Part I, Appendix C).

#### **3.1.4.2 Disposition Of Internal Waste Water Streams**

This activity involves the evaluation and disposition of routine and non-routine waste streams. A determination is made as to whether the water is discharged to the WWTP or transferred to another Site treatment facility. This activity is necessary to prevent discharges that could disrupt microbial treatment processes at the WWTP, with resultant potential NPDES permit violations and penalties. Because this activity transfers, but does not deplete waters within the industrialized area, no effect to listed species onsite or off-Site is expected. The USFWS concurred with this project in a previous draft of the PBA (USFWS 2000; concurrence letter in Part I, Appendix C).

#### **3.1.5 Sanitary Waste Disposal**

##### **3.1.5.1 Routine Sanitary Waste Disposal**

The Sanitary Waste Project includes day-to-day collection, transportation, and disposal of non-hazardous, non-radioactive sanitary waste. Waste from routine operations and from decommissioning and demolition activities is collected in dumpsters and rolloff containers. This waste is transported off-Site and placed in an off-Site commercial (Subtitle D) landfill. This activity has no effect on listed species. The USFWS concurred with this project in a previous draft of the PBA (USFWS 2000; concurrence letter in Part I, Appendix C).

#### **3.1.6 Routine Administrative And Infrastructure Support Activities**

Normal administrative activities will continue in buildings and facilities within the industrialized area as Site closure proceeds. These activities may require continuation of infrastructure support activities such as operation of the nitrogen plant, as well as logistical support, receiving and shipping, ambulance service, traffic management, excess property disposition, facility management, and security force operations. Consultation regarding these routine administrative and infrastructure support activities does not include issues related to water depletion related to these activities. Water use and depletions from these routine activities will be discussed in Part II of the PBA. Otherwise, because these activities are conducted within the industrialized area where no habitat for listed species exists, there will be no effect on listed species from continuation of these activities.

#### **3.1.7 Utilities**

As facilities are deactivated and closed, the need for utility services and systems will diminish. Deactivation of utility systems includes:

- Site water treatment plant: Once closed, bottled, potable water will be supplied to all remaining operational buildings or potentially by individual, portable water purification units.
- Site nitrogen plant: It will be shut down when special nuclear material needs no longer require the nitrogen.
- The steam plant boilers: The steam plant boilers have already been shut down and the Site is operating on portable skid boilers.
- The natural gas distribution system: It will be shut down as areas and facilities are closed.
- The Site electrical power distribution system: It will continue in operation through closure to support both deactivation and operational activities, but the number of substations will be reduced to one as soon as operational requirements will allow. Eventually at Site closure it will be reduced to zero.
- Waste water treatment plant: See section 3.2 of Part I of the PBA.

Upon decommissioning, subsurface utilities that are three feet or deeper below ground level may be abandoned (capped, grouted) and left in place. Deactivated underground utilities will be abandoned in place unless excavation is required to facilitate environmental remediation. The end state for utilities projects will occur at the point in time when there is no longer demand by the Site for these utility services, or at such time that the DOE relinquishes responsibility for the Site or for providing utility services. In the interim, these utilities will remain in place and active. Because these activities are located in the IA, no effect is expected to listed species. Power line removals are discussed in another section below. The USFWS concurred with this project in a previous draft of the PBA (USFWS 2000; concurrence letter in Part I, Appendix C).

### **3.1.8 Waste Storage And Removal**

Waste storage is a routine activity at the Site that is conducted within buildings and specific storage facilities located within the IA. The waste storage activities take place in areas well removed from Preble's mouse habitat and watercourses at the Site. The present operation and eventual decommissioning of these storage facilities is expected to have no effect on the Preble's mouse or other listed species, because none of these activities will occur within or adjacent to habitat of any listed species. The waste storage and removal activities were previously concurred with by the USFWS in a earlier draft of the PBA (USFWS 2000; concurrence letter in Part I, Appendix C).

## **3.2 Building And Structure Decommissioning And Demolition**

Building and structure D&D includes the tasks of characterization, site preparation, decontamination, dismantlement, demolition, and project management and support

services. After buildings or structures are removed, revegetation will be conducted using native plant species. These facilities are not located in current Preble's protection areas. Therefore, these D&D activities will not affect the Preble's mouse or other listed species. Water depletion issues associated with removal of these structures will be dealt with in Part II of the PBA. The following table lists the facility clusters and structure numbers along with a short general description, where applicable. The table is not intended to be an exhaustive list of every building/structure number on Site, however, none of these buildings are in Preble's habitat. Any buildings or structures found within Preble's habitat are discussed elsewhere in the PBA. Otherwise, any unlisted buildings or structures are found outside Preble's habitat. This description summarizes several sections that the USFWS had previously concurred with in a previous draft of the PBA (USFWS 2000; concurrence letter in Part I, Appendix C). The table lists the section numbers from the earlier draft PBA where a more extensive description of each facility cluster can be found. Potential indirect effects to the Preble's mouse may include increased noise, dust, erosion, or sedimentation problems. These project activities are not expected to create any erosion or sedimentation problems in the current Preble's protection areas. Best management practices will be used to suppress dust (water spray), and control erosion or sedimentation problems that could reach the Preble's mouse habitat. Excavation and post-project grading will be minimized to the extent needed to accomplish the remediation and cleanup objectives. Disturbances will be revegetated following protocols outlined in Part II of the PBA.

Facility Cluster	Section in Draft PBA	Buildings/structures to be removed
111 Facility Cluster	6.1	111, T111A, T112A, T112B, T112C, T115A, T115B, T115C, 116, T117A, T119A, T119B, T121A, unnumbered guard post, bus stop/car pool shelter. General staff administration buildings and offices.
130 Cluster	3.3	Buildings 130, 131, 132, C130, and temporary buildings T130A through T130J. Administrative offices and warehouse.
SECBZO Facility Cluster	3.1	Buildings 120, T120A, and 920, and their associated underground storage tanks—Tanks 043, 243, 247, 287, 318, and 319, as well as the aboveground replacements for Tanks 243 and 287, TK-32A and TK-1A.
INFMET Cluster	3.2	Building 180. This is the meteorological tower in the NW BZ.
903/905 Cluster	5.1	Buildings 903A, 903B, and 966,
891/900 Groundwater Treatment Cluster	5.2	Buildings 891, 900A, 900B, 900C, 900D, and 900E, and Tanks 891-T-200, T-201, T-202, T-203, T-204, T-205, T-206, and T-207.
125/441 Cluster	6.2	125, 126, 441, tanks 079 and 278. Laboratory, source storage, office buildings, liquid nitrogen storage tanks
444 Cluster	6.3	444, 427, 427A, 445, 447, 448, 449, 450, 451, 453, 454, 455, 457, T444A, and Tank 427
690T Cluster	6.4	662, storage sheds, and Tanks 036 and 037
910 Cluster	6.5	215D, 226, 227, 228A, 228B, and 910, and 3 separate tanks (B226 EDTA Tank, B227 Nitric Acid Tank, and B215D Evaporator Distillate Storage Tank)
559 Cluster	6.6	559, 560, 561, 562, 563, and 564, six tanks
707 Cluster	6.7	707, 708, 711, 711A, and 718, Tanks 206, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 284, 223, 290, 324, 325, and TK-16
750 Cluster	6.8	750, 705, 706, T706A, 707S, T707B, 709, 709A, T750A, T750B, T750C, T750D, and 763 S750, and tank 205
750 Pad Cluster	6.9	Tents 2, 3, 4, 5, 6, and 12, Buildings T750E and T750F, and one tank
750HAZ Cluster	6.10	old 551 RCRA Pad, S374, three hazardous waste storage pads
569 Cluster	6.11	569 and 570

886 Cluster	6.12	875, 886, 880, 886, T886A, 886, 888A, 888, and 828
371/374 Cluster	6.13	371, 374, 373, 374A, 377, 378, 381, T371H, T371J, T371K, 376, T376A, T371I, and 371 A, and tanks 163, 164, 165, 166, 167, 168, 169, 170, 171, 224, 225, 226, 227, and 228
778 Cluster	6.14	778
779 Cluster	6.15	779, 729, 782, 727, 780, 783, 780A, and 780B; cooling towers 784, 785, 786, and 787; and tanks TK-18, TK-19, and TK-24.
771/744 Cluster	6.16	771, 774, 714, 714A, 714B, 715, 715A, 716, 717, 771C, 772, 772A, 774A, 774B, 775, 790, 770, 771B, T771A, T771B, T771C, T771D, T771E, T771F, T771G, T771H, T771J, T771K, and T771L, and tanks 173, 174, 175, 176, 179, 180, 182, 183, 184, 185, 192, 193, 194, 195, 292, and 293.
776/777 Cluster	6.17	776, 777, 701, 702, 703, 712, 712A, 713, 713A, and 781, and Tanks 199, 200, 201, 202, 203, 207, 244, and 245
881 Facility Cluster	6.18	Buildings 881, 881 CT, 881 F, 881 G, and 881 H; the 881–883 Stacks; the 881–883 Tunnel; and Tanks 002, 013, 014, 015, 016, 029, and TK-66
The 865/883 Cluster	6.19	Buildings 827, 863, 865, 865, 867, 868, 879, 883, 889, and 883CT; the Carpenter Shop; and Tanks 010, 011, 012, 024, 026, 252, 323, and TK-25A
The 991 Cluster	6.20	991, 996, 997, 998, 999, 984, 985, and 989, and five tanks
566, 800A, and SECNPZ Clusters	6.21	566, 566A, and 566B, and Tank 132, 830, T881 A, T881 B, T883A, T883B, T883C, T883D, 884, and 885, and the 889 Slab and 890 cooling tower, 213, 260, 372, 372A, 375, 519, 550, 557, 761, 762, 762A, 764, 765, 765A, 773, 792, 792A, 888, 901, and 992, and Tanks 153, 153, 154, 155, 162, 230, and 235.
The INFSEW Cluster	7.1	972, 973, 974, 974A, and 988 Buildings and tanks required for sanitary sewage treatment.
The 440 Cluster	7.2	439, T439A, T439D, 440, and T447A
The 664 Cluster	7.3	664, 666, 668, and T664
The 551 Cluster	7.4	551 and T551 A
The 904/906 Cluster	7.5	T760A, T760B, T904A, and 906; the 904 Pad, the P904 propane tank farm; and pondcrete storage tents 7, 8, 9, 10, and 11
The Process Waste Transfer System (PWTS) Cluster	7.6	207, 528, 728; 730, 731, 732, 828, 867 and 887; 10 valve vaults; and 7 separate tanks.

The 980 Cluster	7.7	965, 968, and 980
The 207 Cluster	7.8	308A, 788, and T788A, and a clarifier tank. B788, T788A, and B308A, Tanks 023 (propane storage, west of Building 788), 136 (cement silo southwest of Building 788), 137 (cement silo west of Building 788), 138 (sludge thickener tank, also known as the 207 Clarifier, east of Building 788), and 139 (propane storage, west of Building 788). Cementation Process Building Cluster, Solar Ponds Pump House
The 964 Cluster	7.9	964 and associated storage buildings

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### **3.3 Specific Projects**

#### **3.3.1 The Present Landfill**

Use of the Present landfill (a portion of Operable Unit 7, OU7) was discontinued in 1998. To provide soil stabilization until final closure, the landfill surface was regraded and revegetated. Maintenance may include visual inspections, repair of settlement and erosion damage, weed control, and reseeding. Required groundwater and surface water monitoring will also be conducted on associated wells. Current closure plans for the landfill entail further covering the landfill with a cobble cover or about two feet of soil and revegetating the area. Operation and maintenance of the existing OU7 seep water treatment installation consists of daily inspections, sample collection and analysis, quarterly reporting, and maintenance. The East Landfill Pond on the east end of the Present landfill will remain in place after closure. Some modification of the East Landfill Pond dam may be conducted, but the work will all be outside Preble's habitat.

Neither the Present landfill nor the East Landfill Pond are located in current Preble's protection areas. The actual physical work conducted to provide final remediation to the Present landfill will therefore have no effect on the Preble's mouse. Although some noise and potential dust from the work on the Present landfill are to be expected, no effect to the Preble's mouse is expected since Preble's mice have never been captured near the Present landfill. In 1996, trapping was conducted at the East Landfill Pond to determine whether Preble's mice occurred there (K-H 1996). Trapping was conducted in the marginal habitat near the inlet of the East Landfill Pond. Trapping was conducted for a total of 480 trapnights over 4 days from August 13-16, 1996 and no Preble's mice were captured at the pond. Additionally, telemetry data collected in the Walnut Creek drainage during 1999 showed no individuals moving in the side drainage where the East Landfill Pond is located. Potential sedimentation and erosion problems from the Present landfill project will be controlled through the use of silt fence and the fact that the East Landfill Pond would capture any sediment that might runoff from the landfill area. Therefore, the project will have no effect on the Preble's mouse.

#### **3.3.2 Recycling Of Concrete From Building Rubble**

During the demolition phase of the building decommissioning discussed above, a large volume (about 130,000 cubic yards) of concrete rubble will be generated. Concrete rubble that meets free-release criteria can be used as backfill onsite. Concrete that is found to be below the unrestricted release limits for radionuclides, and is considered to be non-hazardous, non-beryllium contaminated, and non-Toxic Substances Control Act (TSCA) regulated, can be free-released.

The rubble will be stockpiled at locations in the heavily industrialized areas of the IA where buildings or parking lots were once present. These stockpiles may cover several acres and will have dust suppression and surface water runoff controls in place to protect air and surface water quality. Soil stabilizers will be used to control suspension of dust and fine materials, and silt fencing and berms will be used to control sediment transport

and erosion. Concrete rubble may be processed into backfill material using a crusher. During crushing, a water mist may be used to control fugitive dust. Similar methods or covers may be used when rubble or recycled material is being transported.

No effect on the Preble's mouse is expected from this activity since it will occur in the IA outside of current Preble's protection area. The USFWS concurred with this project in a previous draft of the PBA (USFWS 2000). The concurrence letter is included in Part I, Appendix C.

### **3.3.3 IA Revegetation Activities**

As buildings and structures are removed within the IA, areas will be graded and revegetated with native plant species following the IA Regrading Plan (K-H 2003a) and IA Revegetation Plan (K-H 2003b). These areas are currently upland areas of low quality (i.e. parking lots, previously disturbed areas, buildings) that are located largely outside of Preble's habitat. The portions of the IA located within current Preble's protection areas that will be removed and returned to a native state are discussed in the "may affect, but not likely to adversely affect" section of Part I of the PBA. As these areas of currently low quality value are revegetated with native species, this will create additional native upland areas that may be used by wildlife, including the Preble's mouse. The total acreage of the IA to be returned to a native state is approximately 250 to 300 acres.

Because the activities discussed in this section are outside the current Preble's protection areas, there are no direct effects to the Preble's mouse. Indirect effects, however, may include noise, dust, erosion, sedimentation from these activities. Best management practices, including redundant erosion control measures and monitoring of effectiveness of these controls, will be used to negate indirect effects. Therefore no effect is expected from these activities on the Preble's mouse.

### **3.3.4 Routine Soil Remediation**

Remediation activities will take place at several locations in the IA where cleanup is necessary to meet RFCA agreement requirements. These activities generally involve either removal or appropriate disposal/storage of the soils or covering the areas with additional soil cover. Heavy equipment is used for these activities. Remediation activities will follow the RFCA Standard Operating Protocol (RSOP) for Asphalt and Soil Management (K-H 2001c, Part II, Appendix C). An example of such an activity, but not limited to this project, is the 903 Pad remediation. It is taking place outside current Preble's protection areas. For this project and any others outside Preble's habitat, no direct effect on the Preble's mouse is expected. Best management practices, including redundant erosion control measures where needed, and monitoring of effectiveness of these controls, will be used to negate indirect effects. Remediation projects within Preble's habitat are identified and discussed in other sections of the PBA.

#### **4. Activities That May Affect Listed Species, But Are Not Likely To Adversely Affect**

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The activities listed in this section of the PBA are those that may affect listed threatened or endangered species, but are not likely to adversely affect them. Additional or unforeseen future projects that are not listed in this section will be evaluated based on the following criteria to determine whether they meet the “may affect, but not likely to adversely affect” definition. If projects do not meet the “no effect” or “may affect, but not likely to adversely affect” criteria then they automatically fall into the “adverse effect” category. Evaluations will include an assessment of potential direct and indirect effects, interdependent actions, cumulative effects (effects from state and private party actions), and interrelated actions. Projects described in this section, along with any indirect effects, interdependent actions, and interrelated actions, were deemed to “may affect, but not likely to adversely affect” any listed species (in particular the Preble’s mouse) for the following reasons (the flowchart in Figure 4 summarizes the following criteria and allows for easier determination of project activity effects):

- Only temporary disturbance to the Preble’s habitat will result from these activities (such as trampling of vegetation). No permanent loss of habitat will occur.
- Soil or vegetation disturbance will be limited to that created by pulling of fence posts or guard rail posts, installing temporary flumes, removing power lines, removing riprap piles, removing above ground pipelines, cutting of a few shrub stems to access a work area, or similar type small impacts.
- The majority of the activities are located near established roads, so minimal off-road vehicle use is required.
- The temporal impacts will be minor for these activities. Routine activities may be done monthly or less frequently and typically require only a few hours to complete. For the non-routine activities, the work required to complete the project are mostly one-time events and once completed will no longer require access to those areas in the future.
- For the routine activities, these have been conducted for years at the Site and have had no apparent detrimental effects on the Preble’s mouse or other listed species. Trapping and telemetry data have been collected on the Preble’s mouse in each of the drainages at the Site over the years and have demonstrated that Preble’s mice continue to occur and be captured while the routine activities continue (K-H 1997c, 1998b, 1999b, 2000b, 2001b, 2002b; RMRS 1996). Additionally, specific project trapping and telemetry data have shown the Preble’s mice continue to be captured in the vicinity of project areas during and after project activities have ceased (B-4 Dam Toe Slope Project: DOE 1996; East Trenches Treatment System: K-H 2000b).
- Excavation in the riparian shrub community will not occur except for WARP and power line removals, where previously concurred with by the USFWS.

- Heavy or motorized equipment will enter the riparian plant community or cross water courses only on established roads and dam tops, or as indicated in project descriptions and where previously concurred with by the USFWS.
- The types of equipment needed to accomplish these activities may include pickup trucks, bobcats, all terrain vehicles (ATV), backhoes, trackhoes, front end loaders, cranes, or rolloffs. The type of equipment used would be the minimum needed to conduct the work. Larger pieces of heavy equipment such as backhoes, trackhoes, front end loaders, dump trucks, etc. would be used for the specific projects listed below and would largely remain on roads and other previously disturbed areas.
- The majority of the projects listed in this section of the PBA are scattered throughout the BZ and are not concentrated or contiguous at a given location. Therefore the potential for impacts are minimal because suitable habitat exists adjacent to project areas.
- Most activities are related to removing structures from the BZ, thereby ultimately improving and/or creating additional wildlife habitat, including Preble's mouse habitat.

To minimize impacts to the Preble's mouse, project management will utilize and maintain the following BMPs except where regulatory and/or health and safety requirements take precedence.

- Identify and prioritize Preble's habitat areas that are subject to disturbance and design activities to avoid areas of high habitat value<sup>2</sup>. For example, large willow patches should be avoided.
- Reduce the impact footprint (i.e., no excessive walking in area beyond what is necessary to accomplish the work, minimizing laydown area and equipment storage locations).
- Conduct all activities during daylight hours, when the Preble's mouse is less active when scheduling during the hibernation season of the mouse cannot be accomplished.
- Minimize the length of time spent in sensitive areas (getting work done as quickly as possible, not reentering area once work is completed).
- Use established roads (i.e. paved, gravel, two-track, historically used routes to monitoring locations) for vehicle traffic. If an established road does not exist, use the safest and most direct route that minimizes impacts to the habitat.
- Limit equipment entrance/exit areas to the minimum necessary to accomplish the work.
- Limit vegetation disturbance through alternative actions. For example, prune trees/shrubs rather than remove trees/shrubs; cut shrub stems to allow re-growth rather than grubbing out the entire root system.

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<sup>2</sup> For determination of impacts within current Preble's protection areas, habitat quality was defined based on the 1996 Site vegetation map. Higher quality habitat is defined as all woody vegetation classifications and short marsh, tall marsh, and wet meadow wetland types. Lower quality habitat is defined as all grassland classifications, mud flats, and other disturbed community types. Open water, riprap, concrete, roads, structures are not considered habitat for the Preble's mouse.

- No blading and grubbing of woody vegetation will occur in areas of temporary disturbance.
- Remove trash and unnecessary equipment in project areas after work is completed.
- Revegetate disturbed Preble's habitat with native species after the activity has been completed in accordance with the Habitat Mitigation Techniques Plan (Appendix A, Part II of PBA).
- Prevent spilled fuels, lubricants or other toxic materials from entering Preble's habitat.
- Minimize project activities in wet areas and conditions to avoid damage to the habitat.
- Use erosion controls (i.e., silt fence, hay bales, mulching, tackifiers, surface roughening) to control erosion and sedimentation problems. Projects will monitor erosion control effectiveness and modify control techniques as needed through project completion.
- Use the least amount of and/or smallest equipment necessary to accomplish the work.
- Do not clean equipment in Preble's habitat or in areas where runoff will enter Preble's habitat.
- Staging areas will be located either outside of Preble's habitat, or within the defined project footprint.
- Inspect and clean equipment of weeds/seed to prevent spread of noxious weeds.

Project managers will receive a copy of the PBA and BO, and be briefed on the guidelines and requirements contained therein pertinent to their project. Project management is responsible to ensure compliance with the requirements and guidelines outlined in the PBA and BO. Projects are responsible to follow and maintain the best management practices (BMPs).

The following table lists the activities included in the "may affect, but not likely to adversely affect" section of the PBA. The table summarizes the potential project impacts within the current Preble's protection areas. Additional detail on each project is found following the table. Figures 6 and 7 show the locations of some of these projects. Project evaluations are based on worst case scenarios, except where specific plans or information currently exists. The activities included in this section are being consulted on because they are likely to happen. Their inclusion here, however, does not constitute the fact that they will indeed occur. Human impacts are defined as human foot traffic in an area. Vegetation/soil impacts are defined as activities that in some way disturb vegetation or soil beyond that associated with foot traffic in an area.

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<b>Project</b>	<b>Human impact*</b>	<b>Vegetation/soil impact*</b>
Ecological Monitoring	Foot traffic, once a week, 1 to 2 hours each	None
Air Quality Monitoring	8 samplers in habitat Foot traffic 2X/month	Whack vegetation to 6-8" with hand-held whacker 5 feet around sampler (1 X-2X/annually).
Routine Pond Operations	Foot traffic weekly.	Dam road grading, vegetation removal, dam mowing, riprap rearrangement.
Routine Road Maintenance, Road Repair, Grading, and Mowing	None	1 Xgrading/year, roads no wider than current width 1 or 2Xmowing/year, no farther than 20' off road edge along firebreak roads in BZ
Weed And Vegetation Management	Foot traffic 3X/year. 3 hours per visit.	3 acres of weed control per year/Rock Creek. Pulling weeds, whacking weeds, spraying weeds with herbicide.
Well Abandonment And Replacement Program	Foot traffic during removal.	Approximately 100 wells. Removal of 6 inch pads and/or 4x4 foot pads. Entrance and exit by forklift.
Removal of Concrete Pads from Abandoned Wells	Foot traffic during removal.	Removal of 6 inch pads and/or 4x4 foot pads. Entrance and exit by forklift.
Subsurface Soil Sampling	Foot traffic.	Truck mounted geoprobe entrance to and exit from area.
Groundwater Treatment System Monitoring	Foot traffic.	Replacement of iron filings. Excavation of pipes, near roads.
Trash Removal From Buffer Zone	Foot traffic only. A few days a year.	None
B-4 Pond Building	Foot traffic. One time project.	No off road driving. Removal of 30 by 30 foot structure.
C-1 Pond Rip Rap Pile	None	Removal of 20 by 20 foot pile of riprap, located next to road. Using front end loader, or other heavy equipment. One time project.
Dirt Pile Along Walnut Creek Southwest Of Landfill	None	30 by 40 feet of gravel/dirt removal. Using heavy equipment to either remove pile or push back into borrow area.

<b>Project</b>	<b>Human impact*</b>	<b>Vegetation/soil impact*</b>
Pipeline Removal	Foot traffic for monitoring once to twice a year. Walking along pipeline for visual inspection	Heavy equipment to pull pipeline out of habitat, excavation of pipeline where it crosses the road. One time project. T-posts holding pipeline will be removed.
Fence and T-Post Removal	Foot traffic in areas not accessible by bobcat.	Bobcat like equipment used to pull t-posts and fence posts. Approximately 18,000 feet of fence line.
Gravel/Riprap Storage Area	None	Driving on roads and disturbed areas only. Heavy equipment to remove concrete and gravel. One time project.
Guard Rails Along Roads	None	Heavy equipment, one time project. Approximately 1,000 feet of guard rail.
Power Pole And Power Line Removal	Foot traffic	Driving bucket truck to and from pole. Cutting power pole and dragging pole out of habitat using a bobcat. Approximately 40 poles in habitat.
Security Force Buffer Zone Activities	None	Off road driving in emergencies.
South Interceptor Ditch Maintenance	Quarterly visual inspections of ditch. Foot traffic.	Dredging of ditch from established road running along ditch. As needed.
Temporary Surface Water Flume Projects	Foot traffic for monitoring once installed. 3X/month.	One vehicle to enter and exit area. Soil disturbance approximately 8 sq. feet
Buffer Zone Concrete Removal/Incinerator Project	N/A. Separate consultation.	N/A. Separate consultation.

\* Impacts are estimated and are not exact numbers. N/A = Not applicable.

## **4.1 Environmental Baseline**

In Jefferson County, the Preble's mouse has been captured or suitable habitat exists along portions of Coal Creek and Ralston Creek, in addition to that found in Rock Creek, Walnut Creek, Woman Creek, and Smart Ditch at the Site. Based on the availability of potentially suitable habitat and lack of trapping information, Preble's mice are assumed to occupy appropriate habitat throughout Jefferson County.

In Boulder County, the Preble's mouse has been captured or suitable habitat exists along portions of Coal Creek, South Boulder Creek, Saint Vrain Creek, and within the City of Boulder Open Space and Mountain Parks system. Preble's habitat also exists along South Boulder Canal, Doudy Draw, and Spring Brook. Based on the availability of potentially suitable habitat and lack of trapping information, Preble's mice are assumed to occupy appropriate habitat throughout Boulder County.

During 2002, the USFWS proposed critical habitat for the Preble's mouse (67 CFR 47154). On June 23rd of 2003, the USFWS finalized the critical habitat ruling for the Preble's mouse (68 FR 37275). The final rule excluded the Rocky Flats Environmental Technology Site from critical habitat designation because the Site will become a USFWS National Wildlife Refuge after closure.

## **4.2 Routine Activities**

The following routine activities occur in or adjacent to current Preble's protection areas. These activities are restricted within the boundaries of the Site, and do not affect surface water volumes. Potential impacts to threatened or endangered species are discussed for each activity.

### **4.2.1 Ecological Monitoring**

Ecological monitoring evaluates the status of wildlife and plant communities to provide information used to ensure that operations at the Site remain in compliance with state and federal statutes and regulations, and for natural resource management. The monitoring program entails numerous surveys throughout the BZ as well as the IA. Several driving surveys use existing BZ roads to access areas of interest on the Site. Many areas are inaccessible by road; in these cases, surveys are conducted on foot. Foot surveys are frequently conducted in current Preble's mouse protection areas. Additionally, aquatic sampling (largely fish trapping) is conducted periodically along streams and in ponds at the Site. These activities are not expected to adversely affect the Preble's mouse onsite, or are they expected to have effect on off-Site or downstream species. Best management practices are used to minimize disturbances to the habitat by Ecology Program activities.

As part of the Site's commitment to conserve the Preble's mouse, live trapping may be conducted annually in different drainages at the Site. This monitoring is performed under Section 10 of the sub-permit issued by the USFWS (dated 3/25/02, permit # TE051719-

0), and by permit from the Colorado Division of Wildlife (CDOW, dated 2/25/03; permit # 03-TR569). Copies of both permits are included in Part I, Appendix D.

#### **4.2.2 Air Quality Monitoring**

Air quality monitoring requires routine visits to 38 air sampling sites twice monthly, and to one meteorological tower location (two towers) on a weekly basis. Fourteen of the monitors are located on the Site's perimeter, three are off site in local communities, and 21 are located onsite around or in the IA. Each sampler is accessed via an existing road, and visits include activities such as changing filters, checking flow, and calibrating instruments. Eight of the samplers at the Site are located in current Preble's protection areas. Occasionally, if vegetation gets tall around the sampler location itself, a weed whacker is used to trim the weeds to approximately 6-8 inches in an area extending about five feet from the sampler to allow access and proper operation of the sampler. As Site closure draws closer, electrical power may be shut off to these samplers. Should that occur, small gasoline powered generators will be required to provide power to the samplers, because solar power is not sufficient to provide the power needed to operate the samplers. The generators are the typical type that can be purchased at local hardware stores and operate using lawnmower size engines. The generators would only be operating during normal daylight working hours, unless a project was working into the evening and required longer hours of monitoring. But this is an unlikely scenario. If this occurs, a temporary impact to the habitat would occur where the generator is located and additional trips to the samplers will be required to refuel the generators. A small amount of additional noise would result from the generators, however, because the samplers themselves create a loud whining noise during normal operation, no effect on the mouse from the noise is expected.

Eventually the air samplers will be removed. This will involve driving to the locations, as is done for normal monitoring, removing the samplers from the poles, and later having the power poles removed. The power pole removal activities are discussed in section 4.3.8 of Part I of the PBA.

Because no disruptive actions are taken during visits (other than minimal weed trimming around samplers as needed) and additional activities will occur largely on the roads to and from the samplers there will be no adverse effect on the Preble's mouse.

The meteorological tower, located west of the IA, is visited weekly to download data, and is calibrated over a two- to three-day period twice a year. The tower will be taken down prior to Site closure. The tower and associated structures are located on the pediment top, and not in the current Preble's protection areas, therefore no impact to the Preble's mouse or other listed species will result from this activity. Air quality monitoring activities do not affect surface waters; therefore, there will be no effect from this activity on listed lower Platte River species.

### 4.2.3 Routine Pond Operations

Routine pond operations encompass the transfers of treated wastewater and stormwater between interior ponds, and discharges from the terminal ponds, in the A-, B-, and C-series detention ponds. Proper management of pond operations is necessary to ensure compliance with the Clean Water Act and RFCA. Routine dam monitoring is accomplished by weekly visual inspection and reading of pond levels and piezometers, and by continuous telemetry reading. This monitoring is done from access roads or by foot where roads do not exist. Pond discharges are typically conducted when pond levels reach a certain level. This height can vary, however, based on weather forecasts and other extenuating circumstances. Ponds are usually discharged as batch releases at specified rates (typically a one foot drop in water height per day) although this could vary depending on the situation. The number of annual batch releases varies depending on climatic conditions.

Routine maintenance of dams includes minor repairs and maintenance of the A-, B-, and C-series and East Landfill Pond dams, and includes activities such as dam road grading and maintenance, vegetation removal within the riprap areas of the dams (either mechanical or herbicide), vegetation trimming and vegetation mowing. Dam maintenance, as required by the State Engineer's Office (SEO) and DOE Orders, is necessary to maintain dam safety and integrity. Failure to adequately maintain dams could result in an unscheduled release, potentially resulting in non-compliance with the RFCA, NPDES permits, or threatening the safety of downstream persons, the environment, and property. Additionally, a dam failure would potentially destroy Preble's habitat downstream. Therefore, a balance between dam safety and maintenance versus the protection of the Preble's mouse is required. Vegetation management is an integral component of the dam maintenance and safety program.

Mowing (or burning) on dams and spillways of Site water management ponds has been a routine activity since the 1970s. Federal Energy Regulatory Commission (FERC) inspectors visit the Site annually to inspect dams for safety and maintenance. These inspections are required for compliance with the Bureau of Reclamation and Colorado State Engineer safety regulations. Clearing of vegetation is necessary to prevent the vegetation from obstructing from view potential structural problems in the dam.

Vegetation management activities mentioned above have already been consulted on, and will follow the guidance provided in the BE entitled *Vegetation Management on Water Control Structures and Related Actions in Preble's Mouse Habitat* (DOE 2001; Part I, Appendix C) and USFWS concurrence letter (concurrence letter dated, November 27, 2001; Part I, Appendix C). Actions of this project will not adversely affect the Preble's mouse or its habitat.

In addition to the above concurred upon actions, actions to move or replace riprap on the dam faces may occur in order to keep the dams functional, safe, and in good operating condition. Existing riprap that has shifted over time might need to be moved, or riprap

will need to be replaced. Riprap movement would be restricted to areas where riprap already exists. Areas with existing riprap are accessible from existing roads. Vegetation on any riprap areas is sparse and the current Preble's mouse survey guidance (USFWS 1999) does not recognize riprap as preferred habitat, nor does the Site data indicate that Preble's mice use riprap as preferred habitat. Therefore, since the riprap areas are not considered Preble's habitat and the riprap areas can be accessed from existing roadways and dam crests, the riprap repair activity, although it may affect the mouse, it is not likely to adversely affect the mouse.

Additional vegetation management actions necessary for dam safety inspections are addressed in Part II of the PBA.

#### **4.2.4 Routine Road Maintenance, Road Repair, Grading, and Mowing**

Buffer Zone roads and utilities are maintained routinely to ensure that roads are safe for use, and that utilities remain in good operating condition. When dirt and gravel roads become eroded, grading restores proper drainage and reduces siltation that otherwise could reach streams and affect the aquatic ecosystem. Some BZ roads serve as fire breaks, providing barriers to interrupt the spread of grassland wildfires that occasionally occur in the BZ. These roads also serve as access routes for emergency vehicles such as fire protection equipment and Site security forces, as well as groups who perform various environmental monitoring activities (e.g., surface water, groundwater, air quality, and ecology).

Some road grading and road edge mowing occurs in and adjacent to current Preble's protection areas. This road maintenance has been conducted routinely for 25 to 50 years, depending on location. Areas where roads are adjacent to or cross Preble's mouse habitat have been maintained by annual grading for most of the last 50 years. Road grading activities will not widen the current width of the roads within Preble's habitat. Mowing along the roads within Preble's habitat will not extend beyond 20 feet from the edge of the road.

No effects from the road maintenance activities are expected to any of the species under consideration in this PBA, including the Preble's mouse, because roads are not considered suitable Preble's habitat.

#### **4.2.5 Weed And Vegetation Management**

Weed management in the Rock Creek drainage will follow the BA for natural resource management (including weed control) that was written for the Rock Creek Reserve in the north BZ at the Site in 2001 (USFWS 2001a; Part I, Appendix C). The Biological Opinion (BO; USFWS 2001b; Part I, Appendix C) for this BA stated that a maximum of three acres in the Rock Creek Reserve could be treated annually with noxious weed control/herbicides with no adverse effects to the Preble's mouse. The BO also gave approval for up to three acres of prescribed burning annually within Preble's habitat in Rock Creek.

Weed management in Preble's habitat outside of Rock Creek will consist of biological control insect releases and weed management required by the USFWS for project mitigation areas. Weed management in project mitigation areas are required to meet success criteria set by the USFWS. At this time, no other weed management activities are planned in Preble's habitat at the Site.

#### **4.2.6 Well Abandonment And Replacement Program**

The Well Abandonment and Replacement Program (WARP) ensures that wells associated with the GMP, environmental restoration, decommissioning, and other site closure projects are properly abandoned to protect groundwater quality and comply with State of Colorado Well Construction Rules (2 CCR 402-2). WARP also provides for installation of replacements for damaged GMP wells to maintain compliance with RFCA groundwater monitoring requirements.

Ultimately, WARP will accomplish the abandonment of about 700 or more permitted wells across the Site, leaving only those wells that will be retained for long-term groundwater monitoring. Well abandonments, through Site closure, located in current Preble's protection areas have been addressed and concurred with through a separate consultation with the USFWS (DOE 2002a; USFWS concurrence letters dated February 24, 2003 and April 9, 2003; Part I, Appendix C). Well abandonments in the Rock Creek drainage in current Preble's protection areas were addressed in a biological evaluation in 2002 and concurrence letter from the USFWS (DOE 2002b; USFWS concurrence letter dated September 12, 2002; Part I, Appendix C). In December of 2003, a new Preble's mouse protection area map was made effective (Appendix A of Part I of the PBA). This map increased the size of the protection areas in some spots along the drainages on Site, thereby possibly including more wells in the protection area. Removal of wells that fall in this category will follow methods outlined in the previous BEs and Bos listed above.

#### **4.2.7 Removal of Concrete Pads from Abandoned Wells**

Prior to 1998, a concrete pad with an identifying tag was placed at each abandoned borehole or well location. As part of the Site cleanup, these old concrete pads will be removed from the BZ. The concrete pads range from a circular concrete pad 6 inches in diameter, to those about 4 by 4 foot in size. The old pads will require less work than abandoning wells. The smaller pads will require little more than a sledge hammer to remove the concrete. The 4 by 4 foot concrete pads will require a forklift to be driven to the area. The forklift will lift the pad, and move it out of the area. The only vehicle that will need to approach the concrete pads will be the forklift, and it will only be driven in and out of the area one time. Well abandonments have previously been approved by the USFWS (DOE 2002a, 2002b; USFWS concurrence letters dated September 12, 2002, February 24, 2003, and April 9, 2003; Part I, Appendix C). Removal of these pads will follow the same methods outlined in the previous BE's. By using best management practices, impact to the Preble's mouse habitat will be minimized and no adverse effect will occur from the concrete pad removal activity. Additionally, the removal of the

concrete pads and re-establishment of native vegetation will increase the amount of habitat available for the Preble's mouse at the Site.

#### **4.2.8 Subsurface Soil Sampling**

Subsurface soil sampling is conducted at many locations where characterization of below ground soils is needed. Most of this occurs in the IA where sampling is needed around the buildings or for other remediation activities. Sampling is typically conducted with a geoprobe type sampler mounted on a truck or small Bobcat type piece of equipment. The geoprobe pushes (hammers) a tube into the ground to the required depth. The tube and soil core (up to 3.75 inches in diameter) is removed and the required soil taken for analysis. The hole is filled with granulated bentonite (clay). If any subsurface soil sampling has to be done in Preble's habitat, best management practices would be used to minimize any impacts. Typically only the geoprobe vehicle would be driven off-road to the sample location unless another support vehicle is needed for carrying the soil samples. So the only disturbance to the habitat would be from vehicle tracks off-road, foot traffic during sampling, and the small borehole. No adverse effect to the Preble's mouse is expected from this activity.

#### **4.2.9 Groundwater Treatment System Monitoring**

The Solar Pond, East Trenches, Mound, and 881 Hillside groundwater treatment systems are groundwater collection and treatment structures designed to capture and treat contaminated groundwater. The Solar Pond treatment system is located beneath the north access road north of the Solar Ponds location. The East Trenches treatment system runs beneath and north of the road along the south side of the B-series ponds. At both of these locations the area on the north sides of the roads is grassland that has been revegetated. The Mound treatment system is located beneath the grassland on the hillside south of the 995 complex (sewage treatment plant) and South Walnut Creek. Portions of the Solar Pond, 881 Hillside, and Mound treatment systems and all of the East Trenches treatment system are within the current Preble's protection areas. The 881 Hillside treatment system has already been decommissioned and closed out. The grasslands at the remaining three locations provides some low quality habitat (mostly revegetated) away from the streamside. The above ground portions of both systems consist of several well heads, treatment cells, and water discharge locations. Maintenance of the systems involves collection of water samples from the wells and discharge locations, and removal of the iron filings used to treat the water in the treatment cells. Iron filings are removed from the treatment cell through the use of a vacuum system or a backhoe. Maintenance may also require selective excavation of discharge piping. Excavation of discharge piping will most likely involve a backhoe or trackhoe piece of equipment to remove the discharge pipe from the previously disturbed low quality habitat. Excavations would be the minimum necessary to address piping issues. At the Solar Ponds, the pipe runs beneath a gravel road/parking area and would disturb essentially no actual habitat. For the East Trenches and Mound pipe areas (also located in previously disturbed areas) the overall disturbance would be less than 0.02 acres total. Roads access all of the wells, treatment cells and water discharge areas. Some additional area around the treatment cells is

necessary for bringing in the equipment necessary to replace the iron filing every few years. During 2003, the iron filings needed to be replaced at the East Trenches treatment system and a BE was written for consultation with the USFWS (BE dated 9/19/03, Appendix C of Part I of the PBA). The USFWS visited the site and concurred that the additional area and work required to complete the maintenance activities did not constitute an adverse affect (concurrence letter dated 10/6/03, Appendix C of Part I of the PBA). Future maintenance activities would follow the general guidelines and protocols followed for the East Trenches maintenance. If future planned activities exceed those outlined in the East Trenches BE, further consultation with the USFWS would be pursued. Current plans leave the treatment systems in place and functioning after Site closure. These monitoring and maintenance activities are expected to have no adverse effect on the Preble's mouse or other species under consideration in the PBA. When the Solar Pond and East Trenches Treatment Systems were installed the disturbances were seeded with big bluestem, little bluestem, western wheatgrass, side-oats grama, blue grama, buffalo grass, and blue flax.

As part of the IA Regrading Plan an additional groundwater treatment system may be installed between Buildings 371 and 771. No specific details are currently available on this proposed treatment system, however, the project would be completely outside current Preble's protection areas and would therefore have no effect on the Preble's mouse. Best management practices would be used to minimize and erosion or sedimentation problems in the streams.

Operation and maintenance of the Interceptor Trench System (ITS) was done by collecting ITS water (about 2,000,000–4,000,000 gallons per year) from the Solar Ponds Plume, storing water in the Modular Storage Tanks (MST), and transferring water to Building 374 for treatment through evaporation. These operations were stopped when the Solar Ponds treatment system was installed in 1999. The MST were removed in FY2003, however, they were not located within the current Preble's protection areas. Therefore the MST removal had no effect on the Preble's mouse or its habitat. The USFWS concurred with this project in a previous draft of the PBA (USFWS 2000). Potential water depletions resulting from operation of the Solar Pond Plume Treatment Project (SPPTP) are discussed in Part II of the PBA.

#### **4.2.10 Trash Removal From Buffer Zone**

Trash removal is an ongoing process in the BZ and the IA. High winds blow trash onto the Site from surrounding areas as well as from the IA. Trash usually gets trapped in fences or shrubs and trees in low areas of the drainages. Because the trash that blows in is usually light, it is usually removed by hand, then collected in vehicles parked on established roads before it is removed from Site. If it becomes necessary to drive a vehicle off an established road for trash removal purposes, only one vehicle is driven off the road, and the same tracks are used to enter and exit an area. Using best management practices, no effects are expected to any species under consideration in Part I of the PBA.

## **4.3 Specific Projects**

### **4.3.1 B-4 Pond Building**

A small building that holds a gauging station for monitoring water flows is located on the east edge of the B-4 pond dam. The building stands next to an established road on top of the B-4 dam and is located over the concrete spillway. It is however, located in current Preble's protection area. This structure may be removed. Removal should not require off-road driving since access can be made from the road crossing the dam. The total size of the building and surrounding area is about 30 feet by 30 feet. Best management practices will be used to minimize impacts to the current Preble's protection area. Any soil disturbance will be revegetated with native species.

### **4.3.2 C-1 Pond Rip Rap Pile**

A pile of unused riprap is located to the northeast of the C-1 pond. The area is an old disturbed parking area previously used for riprap storage for projects along Woman Creek. The riprap is located adjacent to an established road and is surrounded by non-native vegetation (smooth brome). The area of the riprap pile is about 20 feet by 20 feet in size. If the riprap pile is removed, heavy equipment will be used to load the rock and transport it away. The equipment would remain on the previously disturbed area around the riprap pile. The ground will then be revegetated using native plant species. Best management practices would be used to prevent erosion and sedimentation problems.

### **4.3.3 Dirt Pile Along Walnut Creek Southwest Of Landfill**

In the late 1970's to the early 1980's a borrow area was used west of the IA along Walnut Creek. A large gravel/dirt pile (about 30 feet by 40 feet) remains along Walnut Creek at that area within the current Preble's protection area. As part of the Site cleanup, the pile may be removed or pushed back into the borrow area. If done, the area will be revegetated with native species. The upper western reach of Walnut Creek is separated from the downstream reaches where the nearest populations of Preble's mice are known to occur near the A-series ponds by physical barriers including a parking lot, the north access road, a highly channelized ditch, and the stream going through several hundred feet of underground culvert. Therefore no adverse effect is expected to the Preble's mouse. Best management practices will be used to minimize impacts to the habitat and prevent erosion.

### **4.3.4 Pipeline Removal**

Several aboveground pipelines are located in the BZ and used to pump water between ponds during normal pond operations. One of the pipelines runs from the East Landfill Pond near the Current Landfill to the A-1 pond. This line has been used to pump water from the East Landfill Pond to the A-1 pond. The southern portion of the pipeline runs partially through the current Preble's protection area. Two or three similar pipelines connect the A-series and B-series ponds. Until the pipelines are removed, they will

require occasional monitoring and maintenance. This will include visually inspecting the line on the grassland. However, no vehicles will be used off established roads. Prior to Site closure the pipelines will probably be removed.

The pipelines are buried underground only where they cross under roads in upland areas outside of Preble's habitat. Aside from using heavy equipment on the road to dig up the pipelines at these locations, no excavation will be required for removal of the rest of the pipeline. The pipeline sections will be separated or cut, pulled out of the area, and removed from the Site. T-posts used to hold the pipes in place on the hillside will also be removed. Only the minimum number of vehicles necessary to safely remove the pipeline will be driven off-roads to access the pipelines and remove them. Best management practices will be used to minimize impacts to the current Preble's protection area. Although the pipeline removals may affect the Preble's mouse, they should not adversely affect the Preble's mouse or its habitat.

#### **4.3.5 Fence and T-Post Removal**

Old interior fences and t-posts are located throughout the BZ. Fences include old wooden posts with barbed wire as well as newer steel t-post fences with barbed wire. Most fences and t-posts within the current boundary fence may be removed. Some of the areas where t-posts and fencing is to be removed occur in current Preble's protection areas.

Approximately 18,000 linear feet of fenceline may be removed within current Preble's protection areas. Bobcat-like equipment or small backhoes may be used to pull out the posts from the ground. At some locations where this equipment cannot access the fences, hand removal may be required for safety purposes. Any barbed-wire may be wound up in coils. Both the posts and wire will be moved to an established road where they will be loaded onto vehicles or into a roll-off for removal. Only the minimum number of vehicles necessary to conduct the work safely will be driven off established roads. Best management practices will be used to minimize potential impacts to the current Preble's protection areas. Although the activity may affect the Preble's mouse, it is not likely to adversely affect it.

#### **4.3.6 Gravel/Riprap Storage Area**

An area north of Walnut Creek and just east of the Shooting Range access road, has been used as a storage area for gravel, dirt, and riprap for many years. The area was originally used for onsite concrete mixing. The current piles of gravel and riprap are located in this disturbed area adjacent to an existing road, and will require heavy equipment for removal. The piles of material and the area is not suitable Preble's mouse habitat. However, it is located within the current Preble's protection area. Once the material is removed it, will be revegetated with native plant species. The area is flanked on the south and east by native coyote willow thickets. The shrubs will not be disturbed, nor will vehicles drive off the established roads. Best management practices will be used to minimize impacts to the current Preble's protection area. Vehicles and heavy equipment will remain on established roads and disturbed areas. No adverse effect to the Preble's mouse is expected.

#### **4.3.7 Guard Rails Along Roads**

Guard rails along the Site roads may be removed. Approximately 1,000 feet of the rails occurs current Preble's protection areas. Most of the area surrounding the guard rails is not high quality Preble's mouse habitat since it is usually a road on one side and gravel for a short distance or a road shoulder on the other side. Removal of the guard rails will most likely be accomplished at the same time as the removal of the roads. Disturbed areas will be reseeded with a native plant species. Best management practices will be used to minimize disturbances in the habitat. This activity will not adversely affect listed species.

#### **4.3.8 Power Pole And Power Line Removal**

As electrical service needs diminish at the Site, the need for electrical power lines and power poles to various locations is eliminated. Removal of power lines and power poles began in 2002. Power lines cross through current Preble's protection areas at several locations across the Site. Removal of the power lines within current Preble's protection areas involves driving bucket trucks to the base of the poles, lowering power lines to the ground, removing associated hardware from the poles, cutting the poles, and removing all the materials to be disposed of. Power line and power pole removals at the Site have been previously evaluated and approved by the USFWS. In 2002, two power line removals were approved (DOE 2002c, USFWS concurrence letter dated October 1, 2002; Part I, Appendix C). In 2003, an amendment to the 2002 biological evaluation was done to remove three more power lines in the BZ (DOE 2003). Future power line and power pole removal activities will follow the specifications outlined in the biological evaluations and concurrence letters previously used to conduct these activities at the Site. Although this activity may affect the mouse, it is unlikely that it will cause any adverse effect. No effect is expected on any of the other species listed for consideration under this PBA.

#### **4.3.9 Security Force Buffer Zone Activities**

The Site Security Force is responsible for protecting national security interests at the Site. This often involves patrolling various areas throughout the Site, including areas in the BZ. Depending on the current alert status, the amount of time spent patrolling the BZ varies. Generally the Security Force stays on the BZ roads. There have been instances where they have driven in current Preble's protection areas. Generally it is only noticed as a set of tire tracks going off-road. Until Site security requirements diminish and the need for the Security Force is gone, there may be situations where off-road driving will be required as a result of security responsibilities and emergency situations. Occasionally the Security Force holds training sessions, involving local law enforcement agencies, in the BZ. Training exercises are not allowed in current Preble's protection areas. Education of security force personnel will be conducted to inform staff of the importance of staying on established Buffer Zone roads because of the Preble's mouse. If accidental

damage to Preble's habitat result from emergency activities it would be mitigated by reseeded the areas with native plant species and using best management practices.

#### **4.3.10 South Interceptor Ditch Maintenance**

The South Interceptor Ditch (SID) prevents water coming off the pediment to the south of IA from going into the Woman Creek drainage. The water runs in the SID and into the C-2 pond. Routine monitoring of the SID for structural integrity is required. An established road runs on one or both sides of the SID banks. Monitoring entails driving on the ditch roads and inspecting the riprap and other ditch structures. Maintenance may include dredging portions of the ditch to allow free water flow or addition of riprap to areas within the ditch needing repair. These activities would be conducted from the established road that runs adjacent to the SID. Portions of the SID are located within the current Preble's protection areas. The SID is located on the hillside north of Woman Creek.

On October 1, 2002, the USFWS released a final rule (FR 67:61531) that provides private landowners an exemption to conduct ditch maintenance activities on their properties in Preble's habitat. These exemptions were provided to allow landowners to maintain water conveyance ditches so they function properly and continue to provide habitat for the Preble's mouse when in Preble's mouse habitat areas. The final rule allows for "normal and customary ditch maintenance activities that result in the annual loss of no more than ¼ mile of riparian shrub habitat within any one linear mile of ditch within any calendar year." The Site will follow the guidelines and direction allowed for ditch maintenance provided in the final rule for ditch maintenance activities for the SID.

It is unlikely that activities for maintenance of the SID will have an adverse effect on the Preble's mouse or other species under consideration in the PBA.

#### **4.3.11 Temporary Surface Water Flume Projects**

Surface water flumes are used at the Site to monitor water flows and to obtain automated grab samples for contaminant analyses as required by regulatory requirements or closure activities. Occasionally these are large concrete structures, but more often they are temporary fiberglass or metal flumes. Replacement of the concrete structures requires the use of heavy equipment and can take several weeks to complete the construction activities. The permanent flume replacements are discussed in Part II of the PBA.

Currently there are no temporary flume installations planned; however, the flumes are typically installed as part of the surface water monitoring required for specific projects. Typical size of the flumes are 5-8 feet in length and sit in the stream bottom. The temporary flumes are installed with hand tools; and this involves setting and leveling the flume in the center of the stream, anchoring the flume in the stream bottom, and setting up side walls made of plywood and plastic vinyl. Habitat disturbance needed to install these flumes is restricted to the stream bottom and two small linear trenches, dug with a shovel or pick, for the wing walls. Soil disturbance (from shovel or pick) is

approximately 8 square feet. Occasionally a few shrubs are trimmed to allow installation. The temporary flumes are installed in one or two days and only require a vehicle to drive the equipment to the stream edge once. Disturbed areas are reseeded with native plant species and future monitoring is conducted on foot, unless the flume happens to be located along the edge of an established road or two-track.

During 2002, a biological evaluation was prepared and submitted to the USFWS for concurrence regarding a temporary flume installation in Woman Creek (K-H 2002c). The USFWS gave approval for the project in a concurrence letter (USFWS concurrence letter dated October 16, 2002; Part I, Appendix C). Future temporary surface water flume installations would be conducted in similar fashion as the 2002 installation. Best management practices would be used to minimize disturbance and impacts to the current Preble's protection areas. Currently no plans exist to install any of these flumes within current Preble's protection areas between now and closure, but the evaluation was made to include the worst case scenarios.

#### **4.3.12 Buffer Zone Concrete Removal/Incinerator Project**

Several areas below the pediment top to the south of the 130 trailer complex were used to dump cement earlier during the Site's history. Removal of the cement flows was begun in April 2003. A part of the lower cement flow was located in the current Preble's protection area. A separate BE was written to cover this project and a concurrence letter approving work within the current Preble's protection areas was received from the USFWS on April 28, 2002. Copies of both of these documents are found in Part I, Appendix C. Project changes and issues that have emerged after the initial BE and concurrence letter are being consulted on with the USFWS outside of the PBA.

East of the 903 Pad along the edge of the pediment another area of past concrete dumping exists. This area however, is outside current Preble's protection area and will have no effect on the Preble's mouse. For all cement removal projects, best management practices will be used to minimize disturbances to the current Preble's protection areas.

## **5. Activities Not Covered By The PBA**

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### **5.1 Site Easement Issues**

Numerous easements exist at the Site for utilities such as power lines, gas lines, and telephone lines. Also water conveyance ditches for water rights owned by non-DOE parties cross the Site at various locations (McKay Ditch, Mower Ditch, Smart Ditch – D-Series Pond water rights). Mineral rights and mining operations are also present at the Site at some locations. Currently no planned activities at the Site related to these easements are scheduled. The responsibility for USFWS consultation for potential impacts to listed species resulting from normal operations, maintenance, and new construction activities related to these easements at the Site, are ultimately the responsibility of the easement parties and would be dealt with through separate consultation with the easement parties, DOE, and the USFWS. Some specific easement activities are discussed below.

#### **5.1.1 McKay Ditch Bypass Monitoring And Maintenance**

Maintenance and monitoring activities on the McKay Ditch and bypass are conducted regularly to make sure the ditch continues to function as a water conveyance structure across the Site. Monitoring consists typically of driving (where roads or two-tracks exist) or walking along the ditch. Maintenance typically involves checking and setting valve settings when the City of Broomfield has water flowing in the ditch. Typical flow periods are early to mid-summer. Checking and setting of valve settings is done on foot by walking from the nearest road to the control structures. No effect is expected to the Preble's mouse or the other species under consideration in this PBA. However, if the City of Broomfield intends to do work beyond this described or that has the potential to adversely affect the Preble's mouse or its habitat, the responsibility for consultation will fall to the City of Broomfield and DOE and is not considered under this PBA.

#### **5.1.2 Smart Ditch Bypass Monitoring And Maintenance**

The Smart Ditch bypass is a small concrete and wooden structure that diverts water from Smart Ditch to the D-Series ponds and other off-Site ponds used for downstream irrigation or other uses. Maintenance and monitoring activities would involve replacing or adjusting the wooden boards used to direct water flow. The area is accessed on foot. The water flows in this drainage come primarily from Rocky Flats Lake, southwest of the Site, and the water rights are owned by private parties. No effect to Preble's habitat or the listed species under consideration is expected from this activity. Any activities beyond these stated here that have the potential to adversely affect the Preble's mouse or its habitat, are not considered under this PBA and will require additional consultation with the USFWS by the appropriate parties.

### **5.1.3 Mower Ditch Bypass**

The Mower Ditch Bypass runs to the north of Woman Creek below the C-2 Pond. The Mower Ditch was used to divert water from Woman Creek to Mower Reservoir east of Indiana Street. The bypass is located within the current Preble's protection area.

Occasional maintenance or monitoring is necessary for the proper operation of the bypass structure. These activities can be largely conducted on foot. Any activities beyond these stated here that have the potential to adversely affect the Preble's mouse or its habitat, are not considered under this PBA and will require additional consultation with the USFWS by the appropriate parties.

## 6. Cumulative Effects

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The Endangered Species Consultation Handbook (USFWS 1998) defines cumulative effects as “those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation” (50 CFR §402.02). A description of the surrounding lands and activities conducted on those lands is presented below.

The Site is surrounded by private, city, county, state, and federal lands. A variety of land use activities occur on these lands. The land to the south of the Site is privately owned rangeland. It is currently used for grazing cattle. However, there are plans to develop portions of these properties as residential subdivision and business developments. The State of Colorado School Board land in Section 16 is also primarily rangeland, grazed by cattle throughout different times of the year. Gravel mining has occurred on this property in the past, however, none has taken place in recent years. The lands between Highway 93 and the mountain front to the west are largely City of Boulder, Boulder County, and Jefferson County open space properties used for some grazing and recreation activities. No development is planned for these areas. Between the Site and Highway 93 there is a narrow strip of private property that the current landowner has attempted to develop in the past, with no success. If development would occur, it would most likely be some type of small business (either office space or perhaps light industry). On the western edge of the Site, within Site boundaries, two gravel mine operations are currently active. Current plans, dependent on permitting, would mine much of the western portions of the BZ at the Site.

The northwest corner of the Site is bounded by the NREL. Research on renewable wind energy is conducted at the facility. Most activities involve the installation and removal of large wind generators. To the north, the Site is bordered by City of Boulder and Boulder County open space property. On the east, most of the land is City of Broomfield and City of Westminster open space property. A small amount of development (housing and office space) has occurred along Highway 128 east of Indiana Street. Along the eastern edge of the Site, there is a measure included in the Rocky Flats Wildlife Act that would allow a 300 foot corridor for development of the C-470 highway.

Because most of the surrounding land use is either rangeland or open space, no cumulative effects are expected to the Preble's mouse from these lands. These lands actually provide additional buffer areas around the Site as habitat. Where riparian habitat exists on some of these properties, steps (e.g. the use of fencing to keep cattle away from the streams) have been taken to preserve and enhance these corridors as wildlife habitat. Development activities planned for private property around the Site edges would be away from drainages at the Site and would have minimal or no effect on the mouse habitat at the Site.

The gravel mining operations on the western edge of the Site pose a potential undefined threat to the Preble's mouse habitat at the Site. It is currently unknown as to how or whether the mining operations might impact hydrologic conditions at the Site. Groundwater flows from the west provide water to the many seeps or stream flows that sustain Preble's habitat at the Site, particularly in the Rock Creek drainage. Because the drainages on Site lie largely at the headwaters of their respective watersheds, mining could potentially alter the groundwater water and surficial water flows on the Site. Currently, however, no data are available to make definitive statements about what may or may not happen. In addition, the mine operator continues to renew mining permits in order to expand mining operations. Concerns about the Preble's mouse habitat could be raised during the permitting process.

The proposed C-470 highway would potentially cut off the eastern most edges of the Preble's habitat at the Site in both the Walnut Creek and Woman Creek drainages. However, the habitat at these locations is of much lower quality than that found further west in either drainage. No mice have been captured within the area that would potentially become the highway. Currently, there are no specific plans to develop the C-470 highway along the eastern edge of the Site. As plans for the highway are developed in the future concerns about the Preble's mouse habitat could be raised during the planning process.

Numerous easements exist at the Site for utilities such as power lines, gas lines, and telephone lines. Also water conveyance ditches for water rights owned by non-DOE parties cross the Site at various locations (McKay Ditch, Mower Ditch, Smart Ditch – D-Series Pond water rights). Mineral rights and mining operations are also present at the Site at some locations as mentioned above. Currently no planned activities at the Site related to the these easements are scheduled. The responsibility for USFWS consultation for potential impacts to listed species resulting from normal operations, maintenance, and new construction activities related to these easements at the Site are the responsibility of the easement parties and would be dealt with through separate consultation with the USFWS.

Activities in areas surrounding the Rocky Flats Environmental Site will have no effect on DOE activities related to the cleanup of the Site.

## 7. Analysis Of Impacts

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### 7.1 Definitions

The following definitions, cited from the Endangered Species Consultation Handbook (USFWS 1998), were used in categorizing the effects from actions discussed in Part I of the PBA on the selected threatened or endangered species considered in Part I of the PBA:

- “*No effect*” — the appropriate conclusion when the action agency determines its proposed action will not affect a listed species or designated critical habitat.
- “*May affect*” — the appropriate conclusion when a proposed action may pose any effects on listed species or designated critical habitat. When the Federal agency proposing the action determines that a “may affect” situation exists, then they must either initiate formal consultation or seek written concurrence from the Services that the action “is not likely to adversely affect”.
- “*Is not likely to adversely affect*” — the appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial.
- “*Is likely to adversely affect*” — the appropriate finding in a biological assessment (or conclusion during informal consultation) if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not: discountable, insignificant, or beneficial (see definition of “is not likely to adversely affect”). In the event the overall effect of the proposed action is beneficial to the listed species, but is also likely to cause some adverse effects, then the proposed action “is likely to adversely affect” the listed species. If incidental take is anticipated to occur as a result of the proposed action, an “is likely to adversely affect” determination should be made. An “is likely to adversely affect” determination requires the initiation of formal section 7 consultation.
- “*jeopardize the continued existence of*” — to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.

## 7.2 Findings

The activities listed in Part I of the PBA will not affect water depletions within the greater Platte River basin. Therefore, no effects on the lower Platte River species are likely to occur from these on-Site actions. Lower Platte River species considered in this evaluation include the piping plover, the least tern, the whooping crane, the pallid sturgeon, the Eskimo curlew, the American burying beetle and the western prairie fringed orchid. Additionally, no effect from water depletions related to the Preble's mouse at the Site are likely, related to Site closure activities.

The bald eagle is a casual user of the Site. Site wildlife surveys have noted approximately one observation per year for the past six years. Bald eagle nesting has never been observed on Site. Therefore, DOE actions described in Part I of this PBA will have no effect on the bald eagle. Black-footed ferrets, boreal toads, Canada lynx, greenback cutthroat trout, Mexican spotted owls, mountain plovers, and Pawnee montane skippers do not occur at or near the Site. Ten years of ecological monitoring have never documented these species at the Site (DOE 1992, 1993, 1995; K-H, 1997c, 1998b, 1999b, 2000b, 2001b, 2002b; RMRS 1996). Therefore, the DOE actions described in Part I of this PBA will have no effect on these species. The black-tailed prairie dog occurs at the Site, but is a candidate species which is non-statutory and therefore is not considered in this PBA.

Ute ladies'-tresses, and Colorado butterfly plant, both listed species, though they occur in the Site's vicinity, have not been documented on the Site, nor in off-Site areas that might be affected by these actions (ESCO 1993, 1994). DOE activities described in Part I of this PBA will have no effect on these species.

### 7.2.1 Preble's Mouse Findings

The Preble's mouse occurs at the Site, and has been documented and studied extensively in each of the main drainages at Rocky Flats. Studies at the Site have focused on trapping and tagging Preble's mice, and tracking their movements through the use of telemetry. In addition, habitat characterization has been done to quantify habitat parameters at the Site. The data from these studies have yielded information on Preble's mouse habitat, areas of occupation, home ranges, and mouse movement at the Site. Using this information, Site ecologists developed a Preble's mouse protection plan (DOE 2000) that includes a Preble's mouse protection area map and a means of evaluating Site activities for potential impacts to the mouse. Appendix A to this section of the PBA outlines the methods that were used to delineate areas as Preble's mouse protection areas. These actions have been taken proactively by DOE to protect the Preble's mouse and its habitat at the Site. During 2002, the USFWS proposed critical habitat for the Preble's mouse (67 FR 47154). On June 23rd of 2003, the USFWS finalized the critical habitat ruling for the Preble's mouse (68 FR 37275). The final rule excluded Rocky Flats Environmental Technology Site from critical habitat designation. Therefore, project disturbances described in this PBA are based on the current protection areas mapped in Figure 5. Because the Preble's

mouse occurs at the Site, the major focus of Part I of the PBA has been on potential impacts to the Preble's mouse.

The majority of the projects listed in Part I of the PBA are scattered throughout the BZ and are not concentrated at a given location. The projects in Part I of the PBA fall under the criteria outlined at the beginning of the "no effect" and "may affect, but not likely to adversely affect" sections. These criteria include no permanent loss of habitat and limit soil and vegetation disturbances to that created by pulling of fence posts or guard rail posts, removing power lines, removing riprap piles, above ground pipelines, cutting of a few shrub stems to access a work area, or similar type small impacts. Therefore no adverse direct, potential additive, cumulative, direct, indirect, interrelated, and interdependent effects are expected to the Preble's mouse or its habitat from any of these projects.

Additionally, the final 4(d) rule for the Preble's mouse (67 FR 61531-61537) set forth a precedence that in principle if suitable habitat exists adjacent to a temporary project disturbance (i.e. ditch maintenance as addressed in the 4(d) rule), the action would "result in only minimal take of Preble's and is consistent with the protection and enhancement of Preble's habitat." Previous projects conducted in Preble's habitat at the Site during the active season of the mouse have shown the mice can co-exist near active project areas with little apparent impacts (DOE 1996, K-H 2000b). At both the B-4 dam toe slope sand/rock blanket project (DOE 1996) and the East Trenches treatment system project (K-H 2000b), trapping and/or telemetry studies during the project timeframes demonstrated that the Preble's mice continued to exist adjacent to the ongoing projects. For both of these projects heavy equipment, vegetation removal, soil disturbance, and excavation, were being conducted in current Preble's protection areas. At the East Trenches treatment system project, several hundred feet of Preble's habitat was disturbed along the entire B-series of ponds (B-1 to B-4). The USFWS concurred that the East Trenches treatment system project would not have an adverse effect on the Preble's mouse (USFWS concurrence letter dated January 22, 1999; Part I, Appendix C). In neither case, however, did the Preble's mice leave the stream reach where the project activities were taking place. Rather they continued to be captured in the traps and based on telemetry data continued to use the habitat adjacent to the project areas during the duration of the projects. Often the Preble's mice were found just across the silt fence from where project activities were taking place. The conclusions of these studies were that the mice would not be extirpated from areas where projects occurred provided that suitable Preble's habitat was available adjacent to the project areas.

Further evidence of the resilience of the Preble's mouse to disturbance was observed during the summer of 2002 in the Rock Creek drainage at the Site where a wildfire in February 2002 burned about 27 acres. Almost 2200 linear feet of the grassland and riparian vegetation on the north side of Rock Creek was burned along the stream edge. Of this, an additional 280 feet of habitat was burned completely across the stream where the fire crossed the stream and burned to the pediment top on the opposite side of the valley. Small mammal trapping was conducted in June 2002 and a set of 50 traps was

located in and adjacent to the burn area. Twenty-five traps were located on the north side of the fire (with nearly all the traps located in burned areas) and 25 traps located on the south side of Rock Creek in unburned habitat. Two Preble's' mice, an adult male and adult female, were captured about two meters from the edge of the burned area on the north side of the stream on different days. Additionally, while running the trap line one morning, an individual Preble's mouse was observed hopping along in the burn area. So a natural disturbance, much larger than any of the planned cleanup activities in Part I of the PBA did not extirpate the Preble's mouse from these areas since they stayed in the habitat adjacent to the wildfire and even ventured into the burn area.

Based on the potential impacts of the various DOE projects listed in Part I of the PBA (with regard to the current Preble's protection areas), the individual activities and their potential additive, cumulative, direct, indirect, interrelated, and interdependent effects are unlikely to adversely affect the Preble's mouse. Neither are they expected to jeopardize the existence of the Preble's mouse at the Site.

The following table summarizes the findings of Part I of the PBA.

<b>Fauna</b>	<b>Legal Status</b>	<b>No Effect</b>	<b>May Affect, No Adverse Effects</b>	<b>Adverse Effects</b>
American burying beetle*	LE	X		
Bald eagle	LT	X		
Black-footed ferret	LE	X		
Black-tailed prairie dog	C	X		
Boreal toad	C	X		
Canada lynx	LT	X		
Eskimo curlew*	LE	X		
Greenback cutthroat trout	LT	X		
Least tern *	LE	X		
Mexican spotted owl	LT	X		
Mountain plover	PT	X		
Pallid sturgeon*	LT	X		
Pawnee montane skipper	LT	X		
Piping plover*	LT	X		
Preble's meadow jumping mouse	LT	X	X	
Whooping crane*	LE	X		
<b>Flora</b>				
Colorado butterfly plant	LT	X		
Ute ladies'-tresses	LT	X		
Western prairie fringed orchid*	LT	X		

\* = Lower Platte River species

C = Candidate for listing

LT = Listed threatened

LE = Listed endangered

PT = Proposed threatened

Should any of the Site activities listed in Part I of the PBA change in scope, function, or process from what is presented in this document, further consultation (informal or formal) with the USFWS will be pursued.

## 8. Summary

---

This PBA is prepared by DOE to address the potential for Site activities to affect listed threatened and endangered species that are protected under the ESA. Part I of the PBA has been prepared to examine impacts from routine, ongoing activities, and specific closure actions on threatened and endangered species in the vicinity of the Site and in the lower Platte River drainage. The activities and actions addressed in Part I are those that will have either “no effect” or “may affect, but are not likely to adversely affect” species under consideration in this PBA or the Preble’s mouse or its habitat. Part II of the PBA addresses actions that are “likely to adversely affect” the species under consideration in this PBA or the Preble’s mouse or its habitat. It includes the discussion of water depletion issues.

The species evaluated in the PBA include the American burying beetle\*, Bald eagle, Black-footed ferret, Black-tailed prairie dog, Boreal toad, Canada lynx, Eskimo curlew\*, Greenback cutthroat trout, Least tern \*, Mexican spotted owl, Mountain plover, Pallid sturgeon\*, Pawnee montane skipper, Piping plover\*, Preble’s meadow jumping mouse, Whooping crane\*, Colorado butterfly plant, Ute ladies’-tresses; and Western prairie fringed orchid\*. Species noted with an (\*) are South Platte River species.

There will be no effect from any of the activities listed in Part I of the PBA on the species evaluated, with the exception of the Preble’s mouse. Although some activities listed in Part I of the PBA may affect the mouse, it is unlikely that the activities will adversely affect it.

As Site closure proceeds, the activities listed in Part I of the PBA should be able to continue without delays from ESA issues. Should any of the Site activities listed in Part I of the PBA change in scope, function, or process from what is presented in this document, further consultation (informal or formal) with the USFWS will be pursued.

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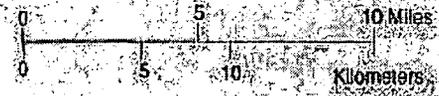
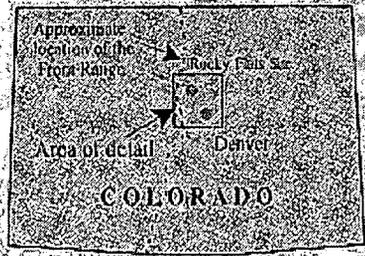
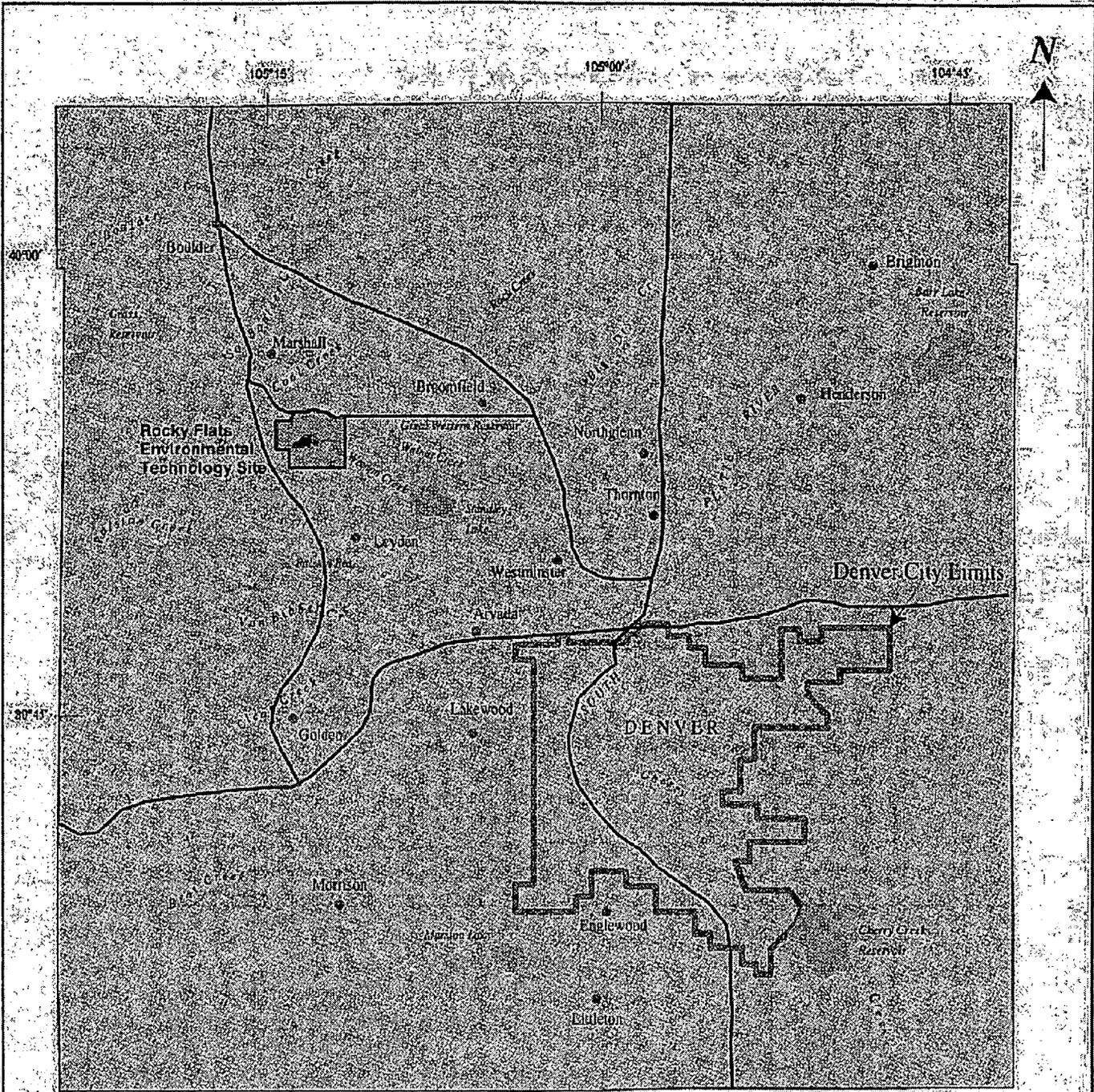
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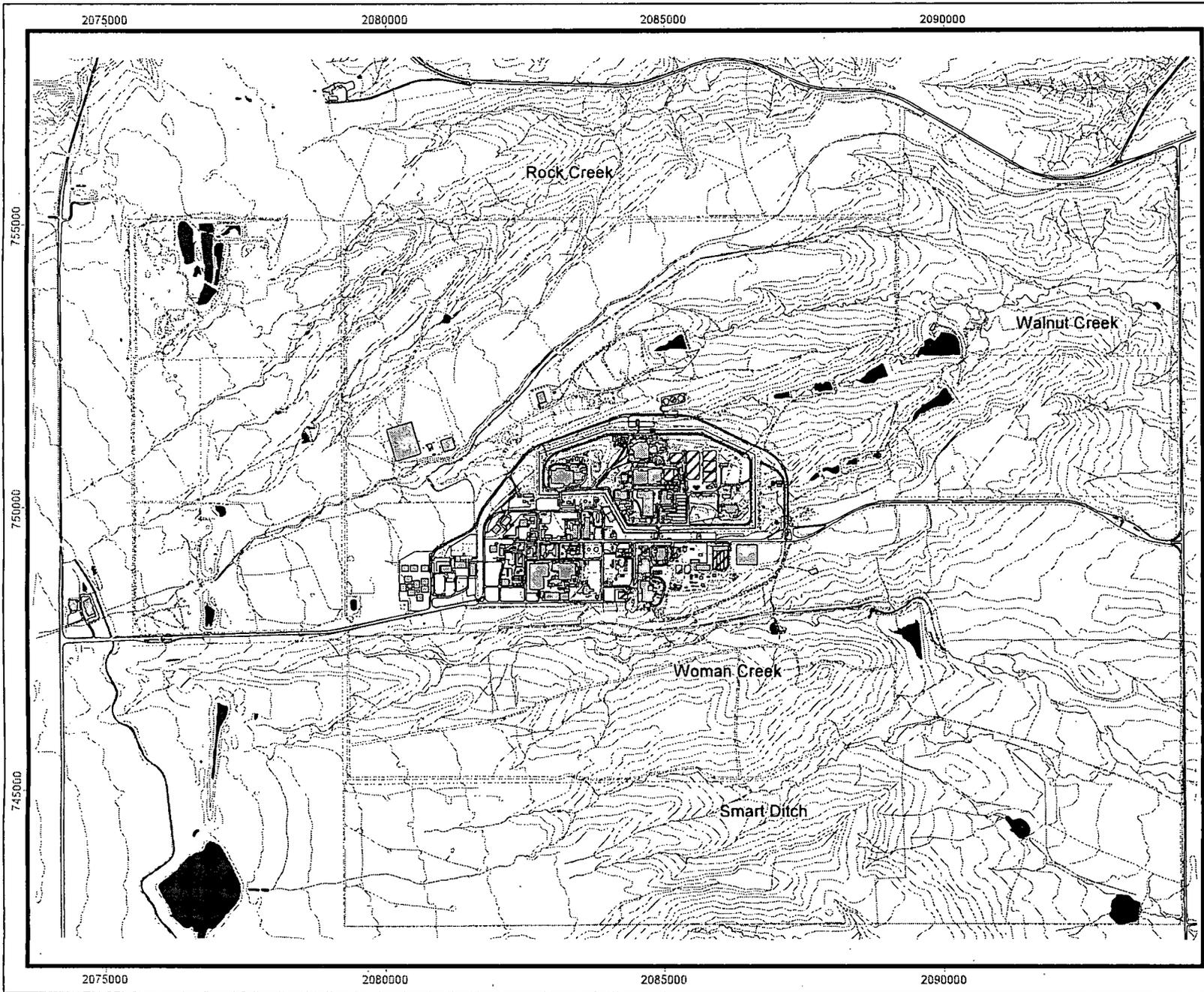
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**Figure 1**  
**LOCATION OF THE ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE**



# Rocky Flats Environmental Technology Site

## Figure 2

### Standard Features

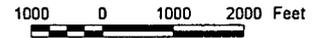
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-  Demolished Buildings
-  Lakes & ponds
-  Streams & ditches
-  Fences
-  Paved roads
-  Dirt roads
-  Contours (20 ft. intervals)

**DATA SOURCE BASE FEATURES:**  
 Buildings, fences, hydrography, roads and other structures from 1994 aerial photo data captured by EOAG RSL, Las Vegas. Digitized from the orthophotographs, 1995.

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State Plane Coordinate Projection  
 Colorado Central Zone  
 Datum: NAD27

### U.S. Department of Energy Rocky Flats Environmental Technology Site

Prepared by: **LABAT** For: **Kaiser-Hill Company, LLC**

RFETS GIS Dept 303-666-7707  
 MAP ID: March 10, 2003

**Rocky Flats Environmental  
Technology Site  
Vegetation Map**

**Figure 3**

**LEGEND**

- Riparian Woodland
  - Upland Riparian Shrubland
  - Wet Meadow/Marsh Ecotone
  - Short Upland Shrubland
  - Willow Riparian Shrubland
  - Annual Grass/Forb Community
  - Xeric Tallgrass Prairie
  - Ponderosa Woodland
  - Reclaimed Mixed Grassland
  - Mesic Mixed Grassland
  - Sarcobatus Shrubland
  - Tall Upland Shrubland
  - Short Marsh
  - Xeric Needle and Thread Grass Prairie
  - Short Grassland
  - Disturbed and Developed Areas
  - Open Water
  - Riprap, Rock, and Gravel Piles
  - Mudflats
  - Tree Plantings
  - Tall Marsh
- Standard Map Features**
- Buildings and other structures
  - Solar evaporation ponds
  - Lakes and ponds
  - Streams, ditches, or other drainage features
  - Fences and other barriers
  - Rocky Flats boundary
  - Paved roads
  - Dirt roads

DATE REVISED: 10/19/98  
 Prepared by: Rocky Mountain Remediation Services, L.L.C.  
 Prepared for: U.S. Department of Energy  
 Prepared by: Rocky Mountain Remediation Services, L.L.C.  
 Prepared for: U.S. Department of Energy

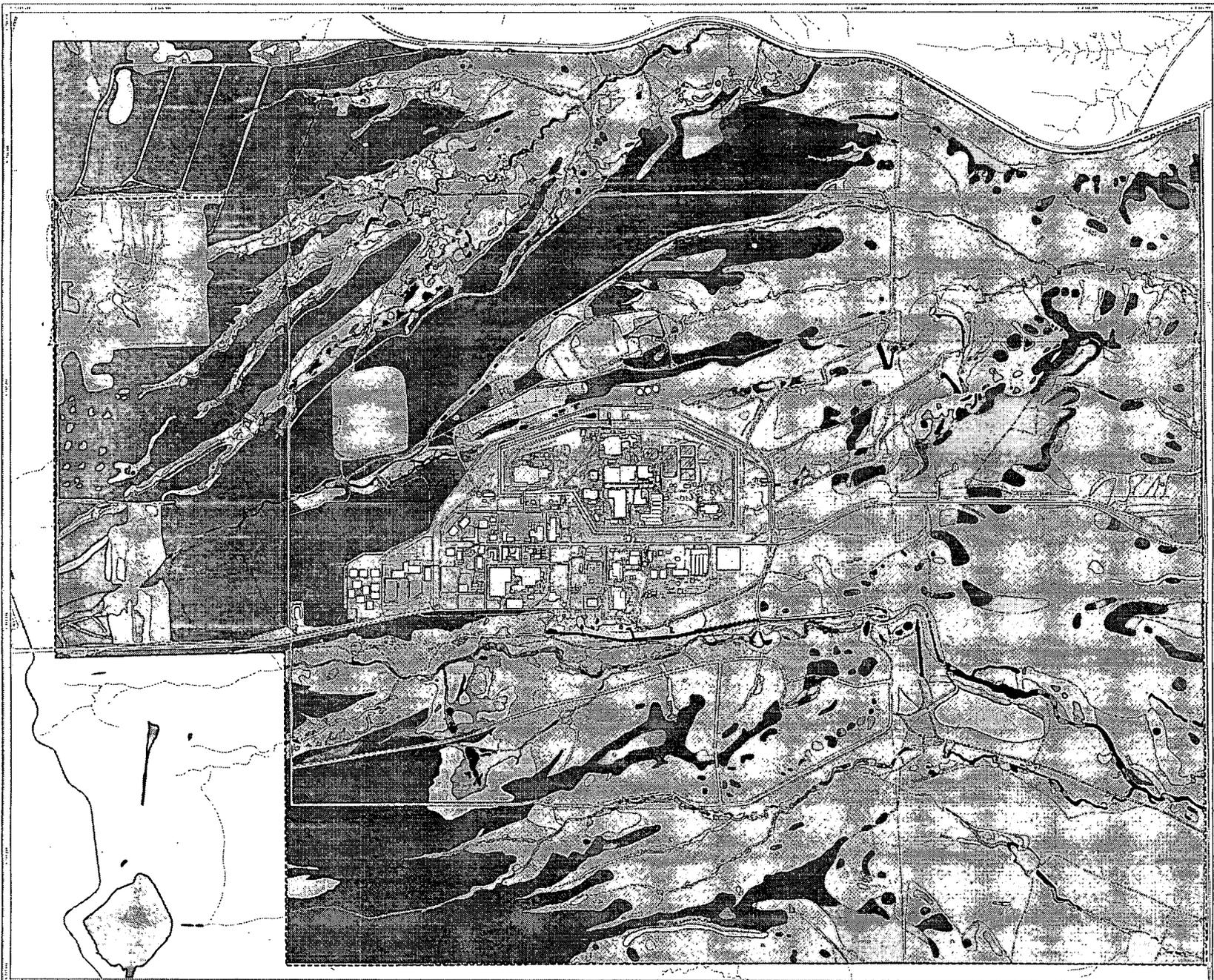
NOT TO SCALE  
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 1 inch = 1250 feet

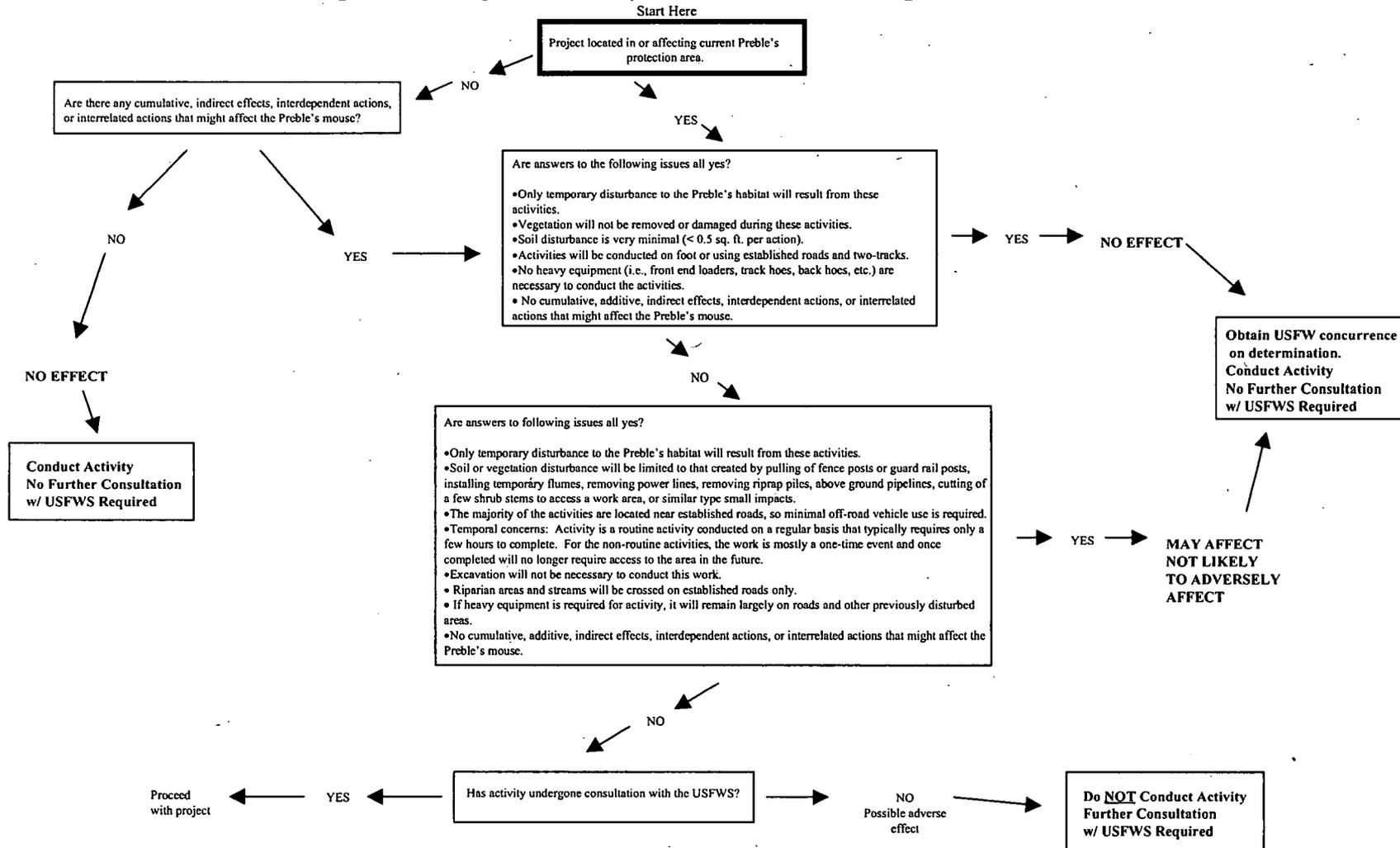
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 Denver, Colorado 80231

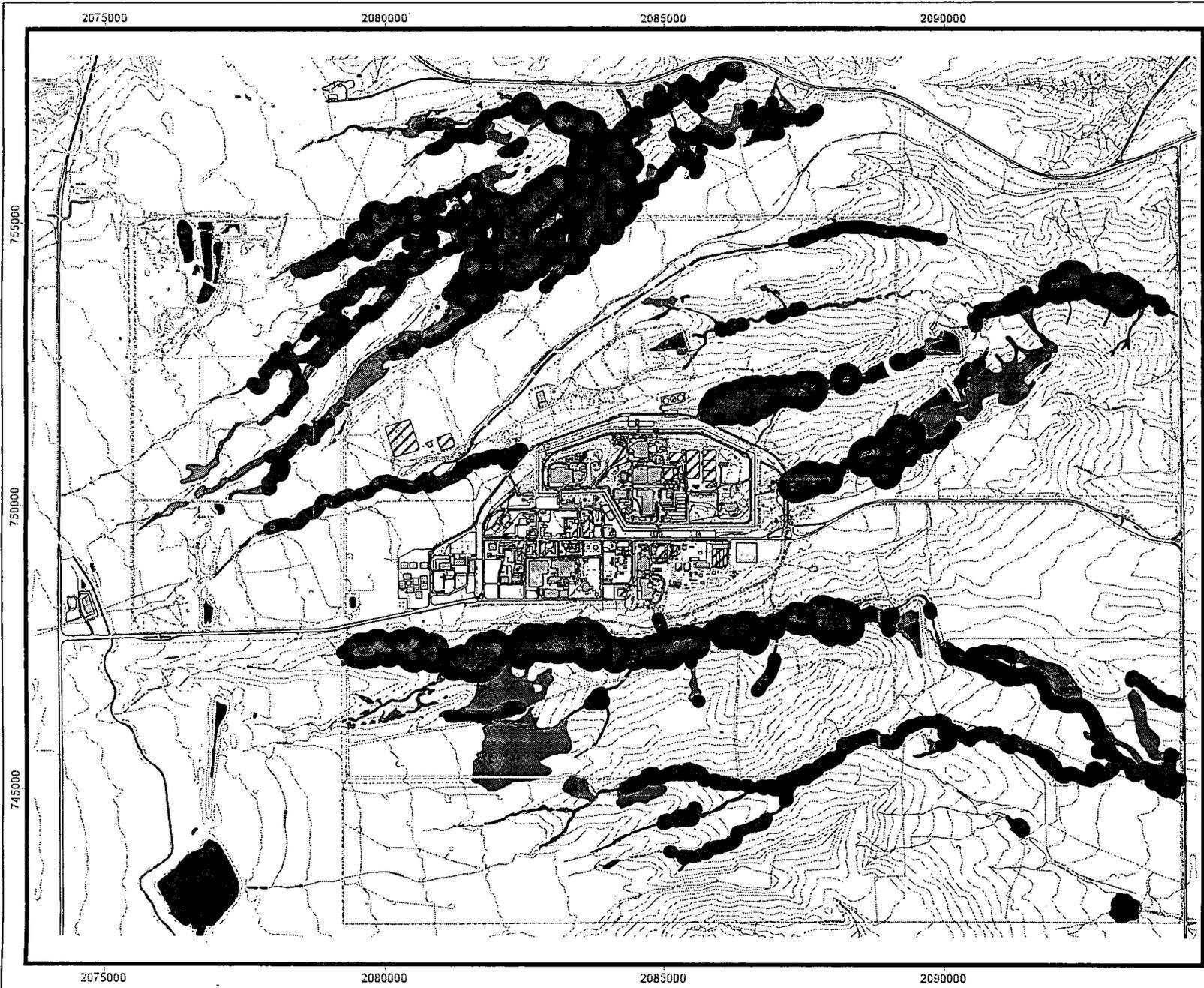
U.S. Department of Energy  
 Rocky Flats Environmental Technology Site

Prepared by:  
**Rocky Mountain  
 Remediation Services, L.L.C.**  
 Remediation Information Systems Group  
 10000 North 100th Street  
 Denver, Colorado 80231



**Figure 4. Project Activity Preble's Mouse Impact Determination Flowchart**





**Preble's Meadow Jumping Mouse  
Current Protection Areas  
at RFETS  
December 2003**

Figure 5

Legend

- Current Preble's Protection Areas
- Contiguous Wetlands
- Preble's mouse telemetry points

Standard Features

- Buildings
- Demolished Buildings
- Lakes & ponds
- Streams & ditches
- Fences
- Paved roads
- Dirt roads
- Contours (20 ft. intervals)

**DATA SOURCE BASE FEATURES:**  
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by ECHO PSL, Las Vegas. Digitized from the orthophotographs, 1995.

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1000 0 1000 Feet

State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD27

**U.S. Department of Energy  
Rocky Flats Environmental Technology Site**

Prepared by: Professional Environmental Group, L.L.C.

For: Kaiser-Hill Company, LLC RFETS GIS Dept.  
303-968-7707

MAP ID: 04-0008 December 16, 2003

D:\Projects\17200004-00009\MapInfo\14\December 2003 PHJM Protection Area Map



Programmatic Biological Assessment  
Part I Projects - 2

Figure 7  
Legend

- Above Ground Pipelines
- South Interceptor Ditch
- Guardrails
- Project Locations

Standard Features

-  Buildings
-  Demolished Buildings
-  Lakes & ponds
-  Streams & ditches
-  Fences
-  Paved roads
-  Dirt roads
-  Contours (20 ft. intervals)

DATA SOURCE BASE FEATURES:  
Buildings, fences, hydrography, roads, and other  
structures from 1994 aerial stereo data  
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State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD27

U.S. Department of Energy  
Rocky Flats Environmental Technology Site

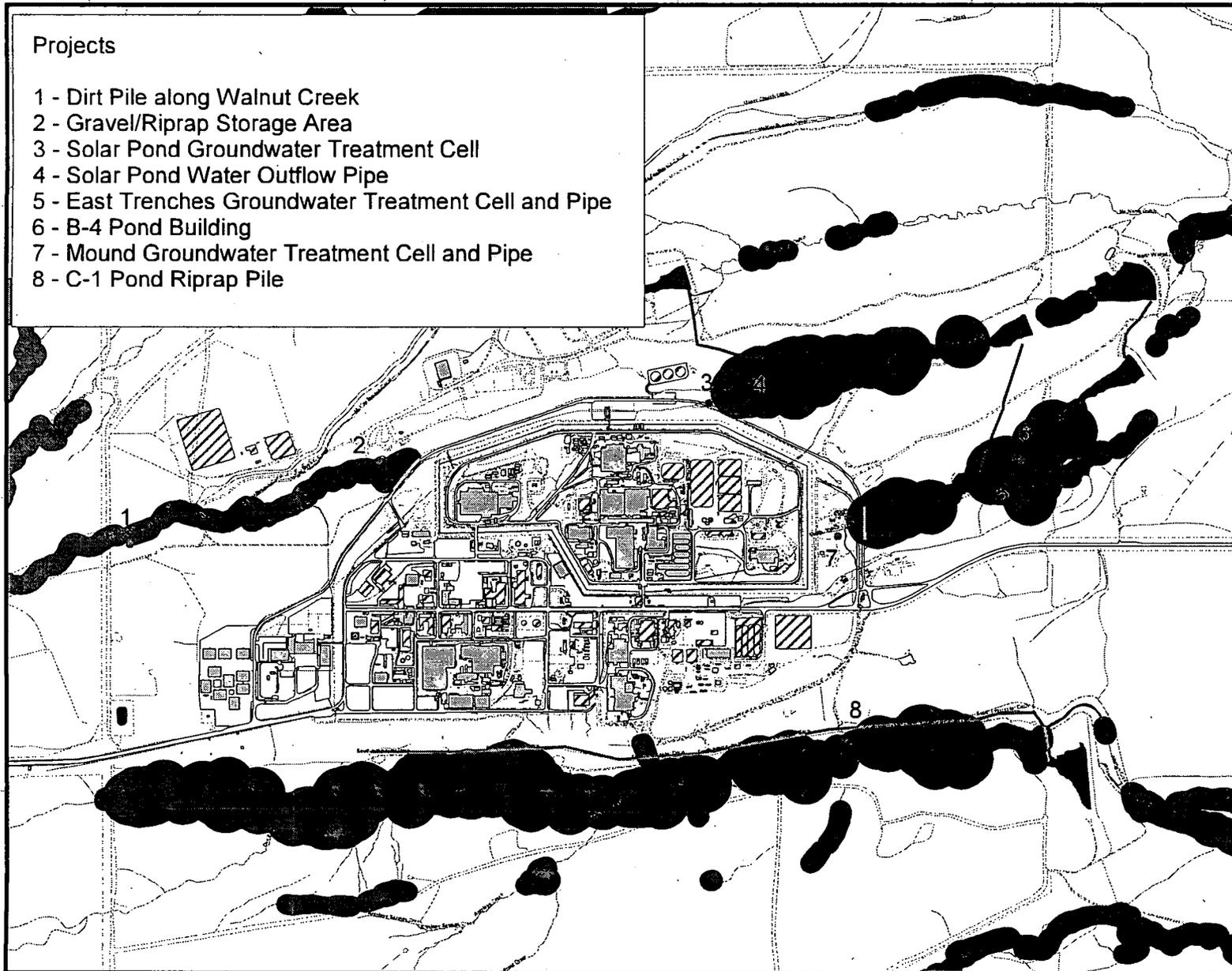
Prepared by: Professional Environmental Group, L.L.C.

For:  Kaiser-Hill Company, LLC  
RFETS GIS Dept.  
303-966-7707

MAP ID: 04-0014 January 22, 20

Projects

- 1 - Dirt Pile along Walnut Creek
- 2 - Gravel/Riprap Storage Area
- 3 - Solar Pond Groundwater Treatment Cell
- 4 - Solar Pond Water Outflow Pipe
- 5 - East Trenches Groundwater Treatment Cell and Pipe
- 6 - B-4 Pond Building
- 7 - Mound Groundwater Treatment Cell and Pipe
- 8 - C-1 Pond Riprap Pile

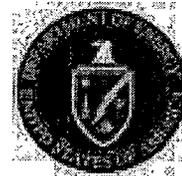


**Appendix A: Preble's Meadow Jumping Mouse Protection  
Plan**

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**PREBLE'S MEADOW JUMPING MOUSE PROTECTION  
PLAN FOR THE ROCKY FLATS ENVIRONMENTAL  
TECHNOLOGY SITE**

**U.S. Department of Energy  
Rocky Flats Field Office  
Golden, Colorado**



**December 2003  
Revision 2  
Classification Exemption # CEX-105-01**

**Prepared for  
US Department of Energy  
Rocky Flats Field Office  
Golden, Colorado 80402-0464**

**By  
Kaiser-Hill Company, LLC**

## Contents

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	Page
1. Introduction	1
1.1 Rocky Flats Environmental Technology Site Background	1
1.2 Preble's Meadow Jumping Mouse Plan Background	1
1.3 Rock Creek Reserve Memorandum of Agreement	3
1.4 Programmatic Consultation in Accordance with Endangered Species Act Consultation Memorandum of Agreement	3
2. Preble's Meadow Jumping Mouse Protection Plan	5
2.1 Preble's Meadow Jumping Mouse Protection Plan Overview	5
2.1.1 Responsibilities	6
2.1.2 Actions Authorized in Preble's Mouse Protection Areas	6
3. Summary	8
4. References	9

Appendix A – Designation of Preble's Mouse Protection Areas at Rocky Flats  
Environmental Technology Site

# 1. Introduction

---

## 1.1 Rocky Flats Environmental Technology Site Background

Construction of the Rocky Flats Environmental Technology Site (RFETS) nuclear industrial facility began in 1951. This facility, originally known as the Rocky Flats Plant, remained part of the nationwide nuclear weapons complex until 1992, when it was deactivated. RFETS, owned by U.S. Department of Energy (DOE), is located in rural Jefferson County, Colorado, approximately 16 miles northwest of Denver, and 5 miles southeast of Boulder. RFETS covers approximately 6,260 acres, of which approximately 5,900 acres forms an undeveloped Buffer Zone (BZ) around the central industrialized portion. The original 1951 land purchase included approximately 2,520 acres of rangeland, which was expanded by an additional 4,030 acres from private ranches in 1974 (some 290 acres were later allocated to the National Renewable Energy Laboratory). RFETS adjoins undeveloped rangeland that is being encroached by housing developments on the northeast and southeast. To the north, east, west, and northwest, public open-space lands border RFETS.

The original mission of this DOE facility was the manufacture of nuclear weapons components. With the end of the Cold War and cessation of nuclear weapons production at the facility, RFETS, classified as a Superfund site, is currently undergoing cleanup and closure as required by the Superfund provisions of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The central industrialized portion of the property (~360 acres) is presently undergoing closure actions and Superfund cleanup. Present plans call for building demolition, infrastructure dismantlement, and subsequent revegetation of the industrialized areas with native prairie species, to continue through 2005.

## 1.2 Preble's Meadow Jumping Mouse Plan Background

In 1991, during baseline and ecological evaluation sampling at RFETS, researchers captured the first Preble's meadow jumping mouse (Preble's mouse; *Zapus hudsonius preblei*) that had been recorded in the vicinity for decades. The first mouse was captured in the Woman Creek drainage, a narrow, but well developed headwaters stream with a mature Great Plains riparian community. Subsequent captures were made that year in the Rock Creek drainage in an area where the Great Plains riparian community is much younger, but is combined with a unique seep-shrubland community (classified as tall upland shrubland at RFETS). At that time, the Preble's mouse was included on the list of candidate species under consideration for listing under the Endangered Species Act (ESA; USC 1973) by the U.S. Fish and Wildlife Service (USFWS). This discovery stirred new interest in the rare subspecies of the meadow jumping mouse, and further studies were conducted on the RFETS site and in other locations where the mouse had been historically recorded.

The RFETS operating procedure known as *Identification and Protection of Threatened, Endangered, and Special-Concern Species* (T&E Procedure; DOE 1994) was developed to evaluate projects and protect listed species. In 1994, the first informal *Preble's Meadow*

*Jumping Mouse Protection Plan* for RFETS was developed. Since that time, there has been an RFETS plan or policy in place to ensure that the mouse and its habitat are protected from adverse effects of DOE actions.

In 1994, RFETS ecologists began a study of the mouse to determine its onsite distribution, and to characterize its habitat, initially describing the population as the "only known breeding population" of the Preble's mouse. In the intervening years, additional Preble's mouse population areas have been identified along the Colorado Front Range, and into southeastern Wyoming. Much of the early contemporary work on the mouse was conducted by RFETS ecologists who characterized habitat, conducted mouse movement studies, and attempted the first home-range modeling. These data proved invaluable to the USFWS when they received a petition to list the mouse. Additional research was conducted at RFETS and other locations where Preble's mice were eventually found, and data from these studies provided the basis for listing the species as threatened in 1998 (FR 1998a), and later, during development of a recovery plan for the species. In 1998, the Preble's mouse was federally listed as a threatened species under the ESA (FR 1998a). In 1999, DOE and several other agencies signed a Memorandum of Agreement (MOA; USFWS et al., 1999) for ESA compliance with activities at RFETS. As part of the MOA, the Preble's Meadow Jumping Mouse Protection Policy (the original 1994 Plan) was to be finalized as the Preble's Meadow Jumping Mouse Protection Plan. The first step in developing and implementing a Preble's mouse protection plan was to identify appropriate habitat for the species at RFETS. The earliest protection plans for RFETS relied on limited data from preliminary studies, and identified protection areas that were ultraconservative, including large areas of adjacent uplands and other unlikely habitat. As data acquisition onsite became more complete, habitat requirements were better understood, and protection area boundaries were refined to include more likely habitat.

The RFETS site-specific Preble's mouse habitat characterization studies have now examined habitat in all four major stream drainages on RFETS (i.e., Rock Creek, Walnut Creek, Woman Creek, and Smart Ditch). The data collected have allowed RFETS ecologists to describe the range of habitat conditions present where Preble's mice are commonly found onsite (K-H 2000a). Preble's mice are known to occupy all major drainages at RFETS. Studies since 1991 (DOE 1992, 1996; EG&G 1993, 1994, 1995; K-H 1996, 1997, 1998, 1999, 2000a, 2001; RMRS 1996) have documented the presence of the mouse in all stream basins and associated wet areas across RFETS. These studies have provided new information to the USFWS and all Preble's researchers on the mouse's habitat requirements, use of habitat, travel habits, and home ranges.

Although the teams presently developing the Recovery Plan and Habitat Conservation Plans for the Preble's mouse have developed more generic guidelines for designation of Preble's habitat in areas that are not well studied, RFETS' Protection Plan relies on site-specific data from 10 years of study. The generic guidelines are based on delineation around the 100-year floodplains of affected streams. In July 2002, the USFWS proposed critical habitat for the Preble's mouse throughout its known range (67 FR 47154). RFETS was originally included on the list of areas proposed for critical habitat, however, in the final ruling (68 FR 37275), RFETS was not included because the site will become a USFWS national wildlife refuge after closure. RFETS protection areas are based on trapping, telemetry, and vegetation characterization studies that have provided specific information on habitat used for nesting, resting, breeding, feeding, travel,

and hibernation. In most cases this includes the alluvial floodplain, transition slopes, and adjacent upland grasslands. It also includes portions of RFETS' unique wetland features. This information, when considered with likely threats at the site, has allowed RFETS ecologists to develop an effective protection strategy. The criteria used to designate the protection areas are discussed in Appendix A. The current Preble's protection areas for RFETS are shown in Figure 1 of Appendix A.

This present version of the Preble's Meadow Jumping Mouse Protection Plan for RFETS (December 2003) is intended for use as an instrument that directs the active protection of the mouse and its habitat, in conjunction with other standing natural resource management and protection plans, until Site closure is complete. This plan will be effective during the course of the CERCLA-driven Superfund cleanup of the Site as directed by the *Rocky Flats Cleanup Agreement* (RFCA; DOE et. al. 1996). Once the cleanup has been completed, and the Site undergoes the anticipated transition to USFWS management, it is anticipated that this Protection Plan may be revised to address a more proactive management strategy. Such a strategy may include such actions as habitat enhancement, habitat unit enlargement, and attempts to reestablish connectivity between other portions of contiguous stream drainages. These types of actions do not presently fit within the scope of the Superfund cleanup action.

This Protection Plan provides guidance for management decisions at RFETS through closure. Areas selected for protection, and protection strategies are based upon the most current site-specific scientific knowledge available on Preble's mouse habitat and behavior at RFETS.

### **1.3 Rock Creek Reserve Memorandum of Agreement**

One of the current DOE goals is to preserve RFETS' unique ecological resources (DOE 1998), and to protect rare and imperiled species, including the Preble's mouse within its boundaries. In an action that was intended to aid in the interim preservation of important ecological resources at RFETS, DOE, Rocky Flats Field Office (RFFO) entered into an interagency agreement with the USFWS that created the jointly managed Rock Creek Fish and Wildlife Cooperative Management Area (Rock Creek Reserve; USFWS & DOE 1999). This 1,700 acre Reserve is located in a portion of RFETS that has not been significantly impacted by site operations, and will not be affected by cleanup and closure actions. Rather, the area's inclusion in the undeveloped Buffer Zone has provided a measure of protection from habitat conversion and fragmentation that might have otherwise resulted from development. The joint management of this Reserve was outlined in the natural resource management plan for the Reserve published jointly by the USFWS and DOE in 2001 (DOE & USFWS 2001). This Protection Plan integrates all existing resource management plans in effect at RFETS, and proposes additional long-term management strategies, including those for the Preble's mouse.

### **1.4 Programmatic Consultation in Accordance with Endangered Species Act Consultation Memorandum of Agreement**

RFETS has had a Preble's mouse Protection Plan in place as an interim protection policy or plan since 1994. It is DOE's goal here to formalize the present protection plan (DOE 2002) into this Preble's Meadow Jumping Mouse Protection Plan for RFETS (Protection Plan) and thereby satisfy one of the terms of the Memorandum of Agreement (USFWS et. al. 1999) between the

USFWS, DOE, and others. This Protection Plan, in addition to the Programmatic Biological Assessment (PBA; DOE 2003a, 2003b) was identified in that MOA as a specific element required for completion of consultation under the ESA and implementation of RFCA (DOE et. al. 1996). The PBA has been written and is currently waiting final approval from the USFWS. It addresses potential impacts (no effect, may affect but not likely to adversely affect, and likely to adversely affect) from RFETS closure activities (DOE 2003a, 2003b).

## **2. Preble's Meadow Jumping Mouse Protection Plan**

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### **2.1 Preble's Meadow Jumping Mouse Protection Plan Overview**

This Protection Plan supersedes the 2002 version of the Preble's Meadow Jumping Mouse Protection Plan (DOE 2002). This Protection Plan applies to DOE and its contractors and subcontractors. Planned actions will be evaluated by the RFETS ecologists under the RFETS operating procedure known as the T&E Procedure (DOE 1994). This procedure was implemented to ensure that any endangered, threatened, candidate, or state special-concern species will be protected from adverse impacts resulting from DOE actions. The existing Protection Plan, required under the interagency Preble's mouse protection MOA (USFWS et. al. 1999), is specific to the Preble's meadow jumping mouse which is listed as a threatened species under the ESA (USC 1973). This Protection Plan is intended to protect the mouse and its habitat at RFETS.

To acquire the information required for an effective protection strategy for the mouse, in the early 1990s RFETS ecologists instituted a long-term study on the mouse and its habitat requirements at the Site. This study of RFETS-specific conditions has allowed RFETS ecologists to refine their delineation of Preble's mouse habitat and associated areas (Preble's protection areas) that should be protected, to ensure the conservation of the mouse during the site cleanup and closure actions. RFETS-specific habitat knowledge, coupled with a site-wide procedure that instructs project personnel on Preble's mouse protection strategies, has provided RFETS with an effective means to protect habitat, and thereby the mouse, since 1994.

The Protection Plan works in conjunction with the RFETS T&E Procedure (DOE 1994) and the PBA (DOE 2003a, 2003b). These documents allow RFETS ecologists to evaluate new projects during the planning phases, and to help project design/planning personnel develop avoidance and mitigation strategies that minimize potential impacts to these species. Project managers and planners have specific responsibilities under several RFETS procedures, which require evaluation of projects for potential to cause ecological impacts. The PBA, once approved, will allow projects to move forward in a manner that preserves and protects the Preble's mouse, but without timely and costly delays.

As part of the Preble's Protection Plan, Preble's mouse protection areas have been designated at RFETS. The Preble's protection areas are based on trapping, telemetry, and vegetation characterization studies that have provided specific information on habitat used for nesting, breeding, feeding, travel, and hibernation. In most cases this includes the alluvial floodplain, transition slopes, and adjacent upland grasslands. This information, when considered with likely threats at the site, provide an effective protection strategy for the Preble's mouse at RFETS. The current Preble's protection areas for RFETS are shown in Figure 1 of Appendix A. The criteria used to designate the protection areas are discussed in Appendix A.

### 2.1.1 Responsibilities

It is the responsibility of all Project Managers and others involved in activities that may occur within, or otherwise affect, designated Preble's mouse protection areas (see Figure 1, Appendix A) to ensure that work areas and activities are evaluated for potential impacts to the Preble's mouse prior to work initiation. Site activities will be evaluated by RFETS ecologists under Procedure 1-D06-EPR-END.03, *Identification and Protection of Threatened, Endangered, and Special-Concern Species* (T&E Procedure) to protect the Preble's meadow jumping mouse (*Zapus hudsonius preblei*) and its habitat at the Site. Site activities are also evaluated under Procedure 1-S73-ECOL-001, *Wetland Identification and Protection*, which ensures wetland protection at the Site. Wetland protection is also required under the Clean Water Act (CWA). Additionally, the protection areas for the Preble's mouse include some wetland areas. Projects are evaluated for direct and indirect impacts to the Preble's protection areas at RFETS. All projects occurring within the Preble's protection areas will be brought to the attention of the DOE Endangered Species Act Coordinator (as defined in the T&E Procedure) who may initiate formal or informal consultation with the USFWS as appropriate. Most cleanup and closure projects at the RFETS are being covered under the PBA. Once the PBA has been approved, the PBA document will be used to evaluate projects at the RFETS. Projects contained within the PBA will follow the specifics outlined in the PBA and associated Biological Opinion (BO). Any projects not covered under the PBA will require a separate consultation with the USFWS.

### 2.1.2 Actions Authorized in Preble's Mouse Protection Areas

Only necessary work is permitted in mouse protection areas. Necessary work is defined as that work which is designed to study the Preble's mouse; is required to protect or enhance natural resource values; is expressly required by regulatory direction or agreement, including RFCA, or is required as part of the site cleanup and closure. The PBA has been written to address RFETS activities through site closure. Once approved this document will authorize the covered activities. Any activities not included in the PBA would require additional consultation with the USFWS prior to project initiation.

To minimize impacts to the Preble's mouse, project management will utilize and maintain the following best management practices (BMPs) except where regulatory and/or health and safety requirements take precedence.

- Identify and prioritize Preble's habitat areas that are subject to disturbance and design activities to avoid areas of high habitat value. For example, large willow patches should be avoided.
- Reduce the impact footprint (i.e., no excessive walking in area beyond what is necessary to accomplish the work, minimizing laydown area and equipment storage locations).
- Conduct all activities during daylight hours, when the Preble's mouse is less active, when scheduling during the hibernation season of the mouse cannot be accomplished.
- Minimize the length of time spent in sensitive areas (getting work done as quickly as possible, not reentering area once work is completed).
- Explore options with project designers to avoid and/or minimize impacts to the Preble's mouse.

- Use established roads (i.e. paved, gravel, two-track, historically used routes to monitoring locations) for vehicle traffic. If an established road does not exist, use the safest and most direct route that minimizes impacts to the habitat.
- Limit equipment entrance/exit areas to the minimum necessary to accomplish the work.
- Limit vegetation disturbance through alternative actions. For example, prune trees/shrubs rather than remove trees/shrubs; cut shrub stems to allow re-growth rather than grubbing out the entire root system.
- Remove trash and unnecessary equipment in project areas after work is completed.
- Revegetate disturbed Preble's habitat with native species after the activity has been completed.
- When revegetation activities cannot be completed immediately after project completion (i.e., outside optimum seeding window) use alternative erosion controls to control potential erosion and sedimentation problems. Use redundant erosion controls where appropriate.
- Use erosion controls (i.e., silt fence, erosion blankets, hay bales, mulching, tackifiers, surface roughening) to control erosion and sedimentation problems. For large areas, minimize exposed surfaces. Project personnel will be responsible to monitor erosion control effectiveness and modify control techniques as needed (especially after precipitation events). Monitoring will be conducted weekly or more frequently as needed (after precipitation events). Projects will maintain and repair erosion controls through project completion.
- Prevent spilled fuels, lubricants or other toxic materials from entering Preble's habitat.
- Minimize project activities in wet areas and wet conditions to avoid damage to the habitat.
- Use the least amount of and/or smallest equipment necessary to accomplish the work.
- Do not clean equipment in Preble's habitat or in areas where runoff will enter Preble's habitat.
- Staging areas will be located either outside of Preble's habitat, or within the defined project footprint.
- Preble's mouse habitat will not be used as borrow areas.
- Inspect and clean equipment of weeds/seed to prevent spread of noxious weeds.

### **3. Summary**

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This Preble's Meadow Jumping Mouse Protection Plan supersedes all previous versions of the plan and policy that have been used on an interim basis since 1994. This Protection Plan applies to any action taken by DOE RFFO and its contractors and subcontractors that will occur in, or otherwise affect, a Preble's mouse protection area at RFETS, as defined under this Protection Plan. The effective timeframe for this Protection Plan is through site closure. Once the USFWS assumes natural resource management of the Site, it is anticipated that this Protection Plan may be revised or replaced to include proactive management of the Preble's mouse rather than to simply provide protection from harm. During the present cleanup and closure mission of the RFETS site, this Protection Plan provides the framework that will guide protection of the mouse and its habitat.

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## **Appendix A**

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### **Designation of Preble's Mouse Protection Areas at Rocky Flats Environmental Technology Site Data**

# Designation of Preble's Mouse Protection Areas at Rocky Flats Environmental Technology Site

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## 1.0 Preble's Mouse Habitat Identification

Preble's mouse habitat characterization studies have examined habitat in all four major stream drainages on RFETS (i.e., Rock Creek, Walnut Creek, Woman Creek, and Smart Ditch) and have allowed RFETS ecologists to describe the range of habitat conditions present where Preble's mice are commonly found (K-H 2000). Preble's mice are known to occupy all major drainages at RFETS. Studies since 1991 (DOE 1992, 1996; EG&G 1993, 1994, 1995; K-H 1996, 1997, 1998, 1999, 2000, 2001; RMRS 1996) have documented the presence of the mouse in all stream basins and associated wet areas across RFETS. Data considered in delineating protection areas included habitat requirements, use of habitat, travel habits, and home ranges.

Although the teams presently developing the Recovery Plan and Habitat Conservation Plans for the Preble's mouse have developed some generic guidelines for designation of Preble's habitat in areas that are not well studied, RFETS' Protection Plan relies on site-specific data from 10 years of study. The generic guidelines are based on delineation around the 100-year floodplains of affected streams. The proposed critical habitat ruling for the Preble's mouse indicated that the generic guidelines should protect habitat out to 360 feet on either side of the stream for streams of order one and two, such as are found at RFETS (67 FR 47154). RFETS protection areas are based on trapping, telemetry, and vegetation characterization studies that have provided specific information on habitat used for nesting, breeding, feeding, travel, and hibernation. In most cases this includes the alluvial floodplain, transition slopes, and adjacent upland grasslands. This information, when considered with likely threats at the site, has allowed RFETS ecologists to develop an effective protection strategy. Areas that RFETS ecologists have determined must be protected to ensure protection of the mouse have been designated and delineated for this Protection Plan as shown on Figure 1.

## 1.1 Preble's Mouse Habitat Description

In general, Preble's mouse habitat on RFETS can be described as areas along the streams where the herbaceous vegetation (below 1-m in height) is quite dense. The habitat is most often dominated by graminoids, while also having a small to moderate amount of tree and shrub canopy. Horizontal herbaceous density is typically greater than 50 percent. Herbaceous cover (graminoids and forbs combined, measured individually) typically provides greater than 60 percent cover. Tree and shrub cover (above 1-m in height), while often variable, typically provides approximately 20 percent (as measured with a spherical densiometer). Combined tree, shrub, and short shrub cover (measured as individual layers and combined) typically provides greater than 45 percent cover. Specific plant species are not necessarily diagnostic of Preble's mouse habitat when

considered alone; the essential features appear more often to be structure, water, and a mixture of appropriate species together.

## 1.2 Preble's Mouse Home Range Information

Telemetry studies at RFETS have documented area use away from the main stream channels, but this use of adjacent uplands occurs largely when more extensive hillside wetland or side-channel riparian habitat exists, such as in Rock Creek. Movement any significant distance from the main stream channels is in areas where side channels contain free water, and in hillside seep areas where flowing water exists. Telemetry point data (locations of radio collared Preble's mice) gathered in each of the main drainages at RFETS from 1998 through 2001 are shown in Figure 1. Across all drainages, 92 percent of all the telemetry points fall within 100 feet of the edge of the riparian habitat (i.e., what was designated as the original Preble's protection areas). Table 1 summarizes the percentage of telemetry locations for Preble's mice that were located within the 100 foot edge of the riparian habitat.

**Table 1. Rocky Flats Preble's Mouse Telemetry Data Within 100' of Riparian Woody Vegetation**

	Total # of points	Points within 100' of the edge of riparian woody habitat	
		Number	Percent
Whole Site	739	678	91.8
Rock Creek	189	158	87.8
Walnut creek	253	237	90.5
Woman Creek	297	297	95.3

Home ranges have been calculated for mice tracked in Rock Creek (1998) and Walnut Creek (1999) (K-H 2000). These home ranges represent normal summer activities (primarily for males), which include foraging, resting, and breeding, calculated from observations during June/July and August/September. When plotted on a map, the home ranges appear linear-ovate along the main channels, as opposed to the rounder home ranges of other small mammal species. The Walnut Creek summer home ranges that did not include movement into pre-hibernation ranged from 0.6 to 2.8 ha (1.6 to 7.1 acres).

The home ranges in Rock Creek varied from 1.4 to 5.7 ha (3.6 to 14.3 acres). These home ranges are considerably larger than those seen in the Walnut Creek area, and probably reflect the more contiguous habitat available in Rock Creek as compared to Walnut Creek. It is interesting to note that two mice tracked in Rock Creek just prior to hibernation demonstrated much more limited pre-hibernation home ranges. The small home range of the male (0.2 ha, 0.5 acres) illustrates the declining activity just prior to hibernation. The female's late season home range (2.7 ha, 6.9 acres) likely illustrates the roaming that may occur in search for a hibernation site.

### **1.3 Designation of Preble's Mouse Protection Areas**

Since 1994, all available site-specific data on the Preble's mouse, including population and area occupancy data, habitat characterization data, and home range data, have been reevaluated annually to refine the Preble's mouse protection area map. Using these data and in consultation with the USFWS the final Preble's protection area map for RFETS was developed in December 2003 (Figure 1).

Inclusion of all these areas on the protection map is considered conservative because Preble's mice have not been documented in all areas mapped as current Preble's protection areas. To determine what should be designated as protection areas, the 1996 Site Vegetation Map was used as the base map from which units of characteristic Preble's mouse habitat, adjacent grassland vegetation, and wetlands were selected for mapping. Mapping revisions to the riparian corridor understory, made in 1999, and observations made through spring of 2001 were also used to finalize the December 2003 version of the current protection area map (Figure 1).

The current Preble's protection areas include all characteristic habitat where the Preble's mouse has been documented, based on studies conducted at RFETS since 1991 (DOE 1992, 1996; EG&G 1993, 1994, 1995; K-H 1996, 1997, 1998, 1999, 2000; RMRS 1996). This habitat is comprised of woody vegetation types: riparian woodland, riparian shrubland, tall upland shrubland, and short upland shrublands (snowberry and skunkbush sumac adjacent to streams). Also included in the protection area category is a band of grassland/herbaceous wetland, 100 feet in width, around the perimeter of these woody vegetation types. This was chosen because telemetry data has shown nearly all mouse movement occurring within 100 feet of the edge of riparian woody vegetation types (Table 1).

As additional protection of Preble's habitat, the USFWS required a 300 foot buffer around each of the known telemetry points (shown in Figure 1). Thus the width of the current Preble's protection area is wider at the known population centers of Preble's mice at RFETS where telemetry work was conducted.

### **1.4 Identification of Contiguous Wetlands**

The Contiguous Wetlands category shown in Figure 1 includes areas of wetland/wet meadow adjacent to, contiguous with, or upstream from protection areas. This category incorporates both jurisdictional wetlands as mapped by the U.S. Army Corps of Engineers (COE; COE 1994) and wetland areas as mapped on the 1996 Site Vegetation Map. Different definitions and classification schemes were used for these two different efforts, but many of these areas are protected under the Clean Water Act as jurisdictional wetlands because they meet the COE criteria as wetlands. These areas are shown for informational purposes only. They are not considered Preble's protection areas, but in effect the jurisdictional areas provide additional protection for the Preble's mouse. They are also shown because they are important in maintaining the quality of adjacent Preble's mouse habitat.

## 1.5 Conclusion

The current Preble's mouse protection areas in Figure 1 have been developed based on data collected over the past decade at RFETS and in cooperation with the USFWS. This map along with the Preble's Protection Plan and other associated consultation document will provide protection for the Preble's mouse through closure at RFETS.

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**Appendix B: Status and Biology of Federally Listed Species**

## **Appendix B: Status and Biology of Federally Listed Species**

The species of concern considered in this Programmatic Biological Assessment (PBA) include species at or near the Site of operations, and species found along the lower Platte River, where minimum stream flow has become an issue for the continued viability of the habitats used by the species of concern, and in some cases the survival of these species themselves.

Threatened and endangered species that use the Site are the bald eagle and the Preble's meadow jumping mouse. While bald eagles are not permanent residents at the Site, they do forage seasonally within its boundaries. The Preble's meadow jumping mouse occurs at the Site as a year-round resident. Ute ladies'-tresses orchid occurs in the near vicinity of the Site but has not been observed at the Site. There is potential for the species to occur at the Site or in nearby downstream areas, however. Other species considered and discussed in this Biological Evaluation occur in the lower Platte River drainage. These include piping plover, least tern, whooping crane, Eskimo curlew, American burying beetle, western prairie fringed orchid, pallid sturgeon, and sturgeon chub. The black-footed ferret may occur in appropriate habitat between the Site and the lower Platte River drainage.

The discussions of status and biology presented in the sections that follow are largely from the *Programmatic Biological Assessment for Minor Water Depletions Associated with Routine Forest Decisions in the Platte River Basin* prepared by Region 2 of the U.S. Forest Service, and previously accepted by the USFWS (USFS 1995). This Biological Evaluation document is incorporated by reference into this document. Where information has no direct citation, this is the source document.

## **American Burying Beetle (Listed Endangered)**

The American burying beetle (*Nicrophorus americanus*) is listed as an endangered species. The beetle has been recorded historically in at least 150 counties in 35 states (including the District of Columbia) in the eastern and central United States, as well as along the southern fringes of Ontario, Quebec, and Nova Scotia in Canada (USFWS 1999). Its historical range can be described roughly as most of temperate eastern North America, from Nova Scotia as far west as North Platte, Nebraska. The northernmost record is from the upper peninsula of Michigan, and the southern terminus of its range is Kingsville, Texas. During this century, the species has disappeared from more than 90 percent of its historical range (USFWS 1999).

Since 1970, the beetle has been documented in Rhode Island, Oklahoma, Nebraska, Arkansas, Missouri, and Kentucky (USFWS 1999). During 1996, a single specimen was collected in Wilson County, Kansas. Existing populations are known to occur in Rhode Island, Oklahoma, Arkansas, South Dakota, Kansas, and Nebraska.

Historical records for the beetle in Nebraska indicate that the species occurred along watercourses where riparian deciduous or scrub forests were predominant (USFWS 1999). Recent collections in Nebraska (1970–present) were in Custer, Lincoln, and Cherry Counties. Two beetles were collected during July 1988 and 1993 in Lincoln County, within 2 miles of the South Platte River, indicating an extant beetle population in the Platte Valley. The two collections were made within ½ mile of Fremont Slough (a wetland complex), and all recent collections in Nebraska have been in the vicinity of wetlands.

The prevailing theory regarding the species' decline involves habitat fragmentation (USFWS 1999). It is possible that water development may have been a factor contributing to the decline of the beetle in Nebraska. Water storage and diversions substantially reduced high flows in the river, which typically occurred during spring. In turn, the frequency and duration of soil saturation that had been caused by a periodically high water table were reduced. As a result, low-lying prairies and wet meadows in and near the river became drier and were converted to cropland. The continuing loss and fragmentation of grassland habitat may have a cumulative adverse effect on the beetle.

## **Bald Eagle (Listed Threatened)**

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In 1978, the bald eagle (*Haliaeetus leucocephalus*) was listed as endangered, was down-listed to threatened in July 1995 (USFWS 1995a) because of successful recovery efforts, and was proposed for delisting in July 1999 (USFWS 1999). There are approximately 650 bald eagles currently nesting in the western United States, with about 4,500 to 6,000 wintering in the west (USFS 1995). Present-day breeding in the west occurs in the Pacific Northwest, Alaska, the upper Midwest, Colorado, and the tri-corner area of Idaho, Montana, and Wyoming. Historically, bald eagle nesting in Colorado is rare. Five bald eagle nests were recorded in Colorado between 1889 and 1974, with current estimates of 24 breeding pairs (USFS 1995). Breeding bald eagles have been recorded in north-central Colorado, the northern Front Range, and in southwestern Colorado.

Bald eagles around the Site are most commonly observed near the active Standley Lake nest and the Eldorado Canyon roost. Bald eagles periodically make foraging flights over portions of the Site, but have not been recorded pursuing or taking prey within the Site boundaries (EG&G 1995a; RMRS 1996b; K-H 1997). The Standley Lake bald eagle nest was active in 1996, producing a single eaglet that fledged successfully. During 1997, the bald eagle pair again used the Standley Lake nest. One eaglet is known to have hatched, but none successfully fledged (personal observation, M. Murdock, PTI).

Bald eagles commonly winter (October to March) throughout Colorado, with stable wintering populations of 600 to 800 eagles. Since 1991, when regular monitoring was initiated at the Site, winter bald eagle observations at or adjacent to the Site have become common. The bald eagle does not nest regularly in Nebraska, but is a common migrant and winter resident. Along the Platte River between North Platte and Gibbon, approximately 150 to 250 bald eagles winter each year (USFS 1995). Wintering bald eagles in the vicinity of the Site (EG&G 1995a; RMRS 1996b; K-H 1997) and along the Platte River generally arrive in the fall and depart by mid-April (USFS 1995).

Bald eagles preferentially nest in large trees near open water and/or riparian habitats. The nest site has numerous perches with good visibility, and a good feeding area (Stokes 1989). Wintering bald eagles utilize similar habitat for diurnal perching near feeding areas. Eagles prefer to perch in large trees with open areas for visibility on at least one side. Perches are generally established away from human disturbance, although they will tolerate more activity when feeding than when roosting or nesting. Proximity to a food source is probably the most important factor influencing perch selection. The requirements for roosting habitat vary from those for daytime perches. Bald eagles generally select winter roosts that are protected from the wind. In the Front Range area of Colorado, roosts may be in evergreens at higher elevations along the eastern foothills, or in cottonwood groves on the plains. Along the Platte River in Nebraska, nocturnal roosts are primarily large cottonwoods that are typically used every year (USFWS 1994).

Bald eagles prefer to feed on fish during the summer months. Feeding habitats in the winter are diverse and vary with the season and region. Carrion, waterfowl, prairie dogs,

and other mammals provide valuable if not primary food sources when lakes and streams are frozen in Colorado. During the winter, bald eagles along the Platte River in Nebraska rely on waterfowl, gizzard shad, common carp, numerous other fish, carrion, and small mammals. Bald eagles are opportunistic in their feeding behavior and will shift their diets in response to available food supplies. Waterfowl and other birds are generally less important in bald eagle diets when fish are available. Wintering eagles tend to concentrate where food is available, usually around open water where fish and waterfowl can be caught, or where other food is readily available.

The decline in nesting populations during the 19<sup>th</sup> century has been attributed to habitat loss plus mortality from shooting and trapping. During the mid-20<sup>th</sup> century, environmental contamination caused further declines in the population. Direct and indirect effects of organochlorine insecticides severely impacted bald eagle populations. Dieldrin and DDE (DDT) have been implicated most often in deaths of individual birds. Chronic exposure to DDE is known to inhibit reproduction by interfering with calcium metabolism, resulting in thin eggshells and reduced hatching. Heavy metals such as mercury and lead have also caused bald eagle deaths. Secondary poisoning from lead-poisoned prey, particularly in wintering areas where bald eagles feed on crippled ducks and geese, is also a concern (USFS 1995). At present, the main threats to bald eagles are habitat loss and disturbance.

The population of bald eagles has been increasing nationally. The number of bald eagles wintering along the Platte River has increased 16 percent annually since 1980 (USFS 1995). Bald eagle roosting habitat along the Platte River in Nebraska has improved with the establishment of woody vegetation; however, the low flows in the central Platte River of Nebraska are of concern because bald eagles depend on forage fish.

Portions of the central Platte River in Nebraska are key wintering habitat for large numbers of bald eagles (USFS 1995). Availability of numerous forage fish species in open water during winter is important, especially during the coldest part of the year.

## **Black-footed Ferret (Listed Endangered)**

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The black-footed ferret (*Mustela nigripes*), considered to be North America's rarest mammal, is the only ferret species endemic to North America and has been classified as an endangered species by the U.S. Fish and Wildlife Service since 1967. Historically, *Mustela nigripes* ranged throughout the interior regions of North America, from southern Canada to northern Mexico. The historic range in the United States included Arizona, Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, South Dakota, Oklahoma, Texas, Utah, and Wyoming. North American population estimates for the Black-footed Ferret in 1900 ranged from 500,000 to one million. Today, *Mustela nigripes* exists in the wild in three locations, northeastern Montana, western South Dakota, and southeastern Wyoming. All three locations are sites where they have been reintroduced (CP-LUHNA, 2003).

Ferrets probably evolved in Europe, between three and four million years ago, from weasel-like ancestors. The earliest known ferret species, *M. stromeri*, probably gave rise to *M. putorius* and *M. eversmanni* during the middle Pleistocene. Ferrets dispersed from Siberia into North America during the late Pleistocene across the Bering land bridge, and advanced southeastward to the Great Plains through ice-free passageways. Over thousands of years of coevolution with prairie dogs as prey, their behavior and biology gradually changed to suit their environment, and thus, they evolved into today's black-footed ferret. Although the first occurrence of black-footed ferrets is uncertain, scientists speculate that the species has probably been present in North America for at least 100,000 years. Molecular data collected from black-footed ferret specimens indicates that this species diverged from its Siberian counterpart between 0.5 and 2 million years ago.

Black-footed ferrets can be found in the short or middle grass prairies and rolling hills of North America. Each ferret typically needs about 100-120 acres of space upon which to forage for food. They live within the abandoned burrows of prairie dogs and use these complex underground tunnels for shelter and hunting. A mother with a litter of three would need approximately 140 acres to survive.

Black-footed ferrets rely primarily on prairie dogs for food. However, they sometimes eat mice, ground squirrels, and other small animals. Normally, over 90% of a black-footed ferret's diet consists of prairie dogs, which are hunted and killed within their burrows.

The decline of the Black-footed Ferret appears to be directly related to the extermination of prairie dogs. The primary prey for the Black-footed Ferret has been affected by agricultural practices. Habitat disruption, poisoning, trapping and hunting are all common practices to try to combat prairie dogs. As farming expanded, usable habitat for both species was ploughed under. The prairie dog habitat was reduced by 98 per cent and the ferret habitat disappeared with it. Ferrets were indirectly poisoned after eating prairie dogs that were poisoned.

In the 1950s, ferrets were still thought to occur in low densities throughout most of their historic range. By the 1960s, the only known population of black-footed ferrets was a small colony in southwestern South Dakota. That colony was studied from its discovery in 1964 until it disappeared in 1974 for unknown reasons. With the disappearance of the South Dakota colony, biologists feared the species was extinct, or existed in such small populations that natural disaster or disease would eventually eliminate them.

In 1981, a black-footed ferret was killed by a ranch dog in northwestern Wyoming. This event led to the dramatic discovery of a small group of about 130 ferrets near Meeteetse, Wyoming in 1984 and offered a ray of hope for the species. Research conducted on the Meeteetse ferrets provided important new information on the life history and behavior of this secretive mammal. Tragically, outbreaks of sylvatic plague and canine distemper nearly killed all of the Meeteetse population. The remaining 18 ferrets were taken into captivity between 1985 and 1987 in an effort to save the species. At that time, these last known ferrets were probably the rarest mammals on earth (SERM, 2003).

Since 1991, federal and state agencies, in cooperation with private landowners, conservation groups, Native Americans, and the North American zoo community, have been actively reintroducing ferrets back into the wild. Beginning in Wyoming, reintroduction efforts have since expanded to sites in Montana, South Dakota, and Arizona. Proposed reintroduction sites have been identified in Colorado and Utah.

The Recovery Plan for the black-footed ferret calls for the establishment of 10 or more separate, self-sustaining wild populations. By the year 2010, biologists hope to have 1500 ferrets established in the wild, with no fewer than 30 breeding adults in each population. If these objectives are met, the ferret could be downlisted from endangered to threatened status (BFFRIT, 2003).

## **Black-Tailed Prairie Dog (Candidate)**

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On February 4, 2000, the black-tailed prairie dog (*Cynomys ludovicianus*) was designated as a candidate species. The USFWS has information to support the listing of this species, but other species have higher priority for listing. Historically black-tailed prairie dogs were found throughout the plains from Canada to Mexico including the states of Arizona, Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, and Wyoming. This species now occupies narrow bands of dry plains stretching from central Texas in the south to just north of the Canadian-United States boundary. Black-tailed prairie dogs are residents of the short-grass and mixed-grass prairies of the United States. This species occupies a relatively restricted range of open, level, arid short-grass plains. They are commonly found near river flats or in coulee bottomlands where sagebrush, greasewood, and prickly pear grow. They are never found in moist areas. The remote and vast range of the prairie dog makes it difficult to estimate the number of prairie dogs. Occupied acreage for black-tailed prairie dogs is estimated to be approximately one to two million acres, based on available information (Sharps 1990).

Prairie dog tunnels extend downward from 3-10 feet and then horizontally for another 10-15 feet. These systems are arranged so that wind blows through and provides ventilation to their homes. Several tunnels are excavated from the main tunnel to provide nesting areas and places to rest and avoid the hotter part of summer days. Prairie dogs also use these tunnels during the winter to escape bad weather and the cold. They do not hibernate like the true ground squirrels, but do remain dormant in the nest during the peak of winter.

Prairie dogs create a biological niche or habitat for many species of wildlife. Bird species diversity and rodent abundance were higher on prairie dog towns than on mixed-grass prairie sites. Richness of associated vertebrate species on black-tailed prairie dog colonies increases with colony size and regional colony density.

Factors currently impacting the species include chemical control and inadequate regulatory mechanisms. A factor which affected the species historically is the conversion of rangeland to cropland. Conversion of the native prairie to cropland has largely progressed across the species' range from east to west, with the more intensive agricultural use in the eastern portion of the species' range. The Black-footed Ferret Recovery Foundation evaluated the amount of habitat (grass/shrub lands) currently available to the species. In the plague-free portion of the species' range (34 percent), less than 33 percent of the land is available to the species as non-cropland. Therefore, only approximately 10 percent of the black-tailed prairie dog range is both plague-free and currently suitable (i.e., not tilled) (USFWS 2003a).

## **Boreal Toad (Candidate)**

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The boreal toad (*Bufo boreas boreas*) was designated as a candidate species by the Fish and Wildlife Service on 03/23/1995. The toad is a subspecies of the western toad found in the western United States. Historically, the boreal toad occurred throughout most of the mountainous areas of Colorado between 8,500' - 11,500'. In Colorado, the largest populations are typically found in areas characterized by willows (*Salix spp.*), bog birch (*Betula glandulosa*), and shrubby cinquefoil (*Potentilla fruticosa*).

While once considered abundant throughout the mountains of Colorado and southeastern Wyoming, the boreal toad is now absent in over 83% of its previous range. Some factors contributing to the decline of these toads are the Chytrid fungus and human disturbance to wetlands.

Intensive inventory efforts have been undertaken to document this species current range in Colorado over the past several years. Recent surveys at several hundred historic sites have failed to document existing populations. Currently, they are found primarily along the Continental Divide in Mineral, Chaffee, Summit, Eagle, Clear Creek, Grand, Boulder, and Larimer counties. Breeding occurs in permanent or semi-permanent still or slow moving waters (FEI 2003a).

Boreal toads are biologically important for numerous reasons. Boreal toads are indicator species, making them important to biological systems. Since they live in aquatic habitats, and transport water and soluble ions across their skin, water chemistry and environmental changes easily effect them.

Deaths of these endangered toads have been linked to a chytrid fungus that, according to pathologists at the USGS National Wildlife Health Center, is responsible for the loss of many amphibians in Central America and Australia. Until 1998, chytrid fungi had never been known to attack vertebrates, only plants and insects. It is unclear to scientists why the fungus is suddenly attacking amphibians. However, since fungal infections in other vertebrates are considered secondary infections, the USGS is currently conducting studies to determine if viruses, parasites, or bacteria could be predisposing the animal's susceptibility to the fungus.

The boreal toad is listed as an endangered species in Colorado. The Colorado Division of Wildlife is trying to find new breeding sites, monitor current breeding sites, and identify present distributions. To aid in this effort, the Division of Wildlife is attempting to familiarize the public with the conservation issues concerning the boreal toad (Cohu 2003).

## Canada Lynx (Listed Threatened)

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The Canada Lynx (*Lynx canadensis*) was listed as a threatened species on March 24, 2000. The listing applies to the following states in the United States: CO, ID, ME, MI, MN, MT, NH, NY, OR, UT, VT, WA, WI, and WY. Lynx are distributed throughout the broad boreal forest belt of North America and south into the American Rocky Mountains, with a total range of some 7.7 million km<sup>2</sup>. The historic range is largely intact, although it has shrunk in the south due to human settlement and forest clearance. Lynx will inhabit farming country, but only if it is interrupted by sufficient areas of woodland.

In the Great Lakes area and the northeastern United States, lynx habitat is forest that is a mix of evergreens and hardwoods, such as maple and birch. In the Rocky Mountains and Cascade Mountains, lynx live in the spruce/fir forests of the high mountains.

In the contiguous United States, lynx populations occur at naturally low densities. The rarity of lynx is based largely on limited availability of its primary prey, snowshoe hare. At southern latitudes, low snowshoe hare densities are likely a result of the naturally patchy, transitional boreal habitat. Such habitat prevents hare populations from achieving high densities similar to those in the extensive northern boreal forest. Lynx in the contiguous United States are part of a larger metapopulation whose core is located in central Canada. Bobcats appear to be expanding northwards, and have displaced lynx in some areas (GN 2003a).

Canadian lynx have been exploited for furs since the seventeenth century. With restrictions on trade in furs of large cats in the 1960's and '70's, and subsequent reduction of ocelot and margay populations by fur trappers, increased attention has been focused on the pelts of Canadian lynx. However, it seems that the greatest pressure on populations of lynx remains the size of hare populations, not trappers. Lynx help control populations of small mammals, such as snowshoe hares and voles, which are agricultural or silvicultural pests (Fox, et al. 2002).

Because forests are constantly changing, the lynx habitat of today may not be lynx habitat in the future without careful planning. It is important that current forest management is undertaken in a way that will provide for and sustain lynx habitat in the future. Agencies are reviewing lynx habitat needs across the landscape and cooperating with each other to ensure that lynx habitat is maintained or created. The Forest Service has signed a Lynx Conservation Agreement to promote the conservation of lynx and lynx habitat on Forest Service lands. Additionally, the Bureau of Land Management and the National Park Service also are developing lynx conservation agreements. The Forest Service is also undertaking several analyses to amend forest plans to incorporate direction designed to conserve the lynx.

## **Eskimo Curlew (Listed Endangered)**

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The Eskimo curlew (*Numenius borealis*) is listed as an endangered species. The historical record shows that there were three principal spring migration staging areas in the continental United States: 1) Galveston Island and adjacent inland areas of southeastern Texas; 2) Hall, Hamilton, Merrick, and York Counties, Nebraska; and 3) southeastern South Dakota on wetlands adjacent to the Missouri River near Yankton (USFWS 1999).

The decline may have been related to past market hunting, severe storms, and/or habitat loss, both on the wintering grounds of the Argentine Pampas and at migration stops on the North American prairies (USFWS 1999). In the spring, curlews were found in Nebraska on "pieces of land which had not been plowed and where the grasshopper eggs were laid" (USFWS 1999).

The curlew apparently made extensive use of wet meadow habitats while migrating through North America (USFWS 1999). Wetland loss has been extensive on the Great Plains in the last 100 years. About 90 percent of the wetlands in Nebraska's Rainwater Basin area, including the traditional curlew stopover area, have been drained. Loss of wet meadows adjacent to the Platte River has been extensive (USFWS 1999).

Wet meadows and similar prairie grassland vegetation were used most often by the curlew while it was migrating through Nebraska. Wet meadows in the area of Hall, Hamilton, Merrick, and York Counties were of special importance to this species. The most recent record of a curlew in Nebraska was of a single bird foraging with other shore-bird species in a wet meadow on the Mormon Island Crane Meadows Preserve near Grand Island, Nebraska. Based on observations from elsewhere in the species' range, especially during migrations, the wet meadows are apparently of crucial importance to the continued existence of the curlew (USFWS 1999).

## **Greenback Cutthroat Trout (Listed Threatened)**

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In 1978 the greenback cutthroat trout (*Oncorhynchus clarki stomias*) was designated as a threatened species by the Fish and Wildlife Service. Historically, the trout occurred in the sources of the South Platte River and Arkansas River in Colorado, from the headwaters to the foothills, and in a few headwater tributaries of the South Platte in a small area of southeastern Wyoming. Currently, in the South Platte drainage, most stable populations are in Rocky Mountain National Park; a few stable populations exist in the Arkansas River drainage.

Greenbacks are the most easterly of all cutthroats, evolving over two million years from Pacific salmon, steelhead, and coastal cutthroats, that migrated up the Columbia/Snake River system to Yellowstone and the Green/Colorado River system. During the most recent Ice Age (10-20,000 years ago) these ancestral fish somehow managed to cross over the Continental Divide and evolved in isolation thereafter to become a distinct subspecies (CFN, 2003).

This species was abundant in the late 19th century when large numbers of European immigrants arrived in and along the Front Range of Colorado. At that time, fish from 2 to 4.5 kg were relatively common historically and were notable for their extensive migrations to spawn, rear, and overwinter. Mining in the Arkansas River basin and southern tributaries of the South Platte River introduced large amounts of sediment and toxic runoff that reduced or exterminated many greenback cutthroat trout populations, as did agricultural development in river valleys because of water diversions. Furthermore, harvest of greenback cutthroat trout, often with explosives, was sufficiently widespread to have eliminated additional populations. Although by 1919 greenback cutthroat trout were still found in many tributaries of the upper Arkansas River, there are no reports on the status of populations in other locations at that time.

Decline from historic distribution was caused by diversion of water for irrigation, water pollution and sedimentation caused by mining and logging, and especially displacement by introduced non-native trout. Brook trout (*Salvelinus fontinalis*) were the first nonnative salmonids cultured in Colorado in 1872, but other species soon followed. Because cutthroat trout are often replaced by brook trout and brown trout (*Salmo trutta*) and readily hybridize with rainbow trout (*O. mykiss*) and nonindigenous subspecies of cutthroat trout, introductions of nonnative trout, or the invasion of stocked populations into new waters, are believed to have eliminated greenback cutthroat trout from nearly all of their remaining historical range (NS, 2003).

By the 1930s, the subspecies was considered extinct, but an apparently pure population in a portion of the Big Thompson River in Rocky Mountain National Park was found in 1957. Though this population was later thought to be introgressed with nonnative species, additional populations detected in 1965 and 1970 were deemed pure. Consequently, the greenback cutthroat trout was listed as endangered in 1973 under the U.S. Endangered Species Act, and downlisted to threatened in 1978.

Although surveys for remaining populations continue and are occasionally successful, most recovery efforts have focused on establishing new populations. By 1999, introductions had been attempted in 44 waters. Many of these attempts have been successful, to the extent that the greenback cutthroat trout may soon be proposed for delisting under the Endangered Species Act within all or part of its historical range (Young, et al., 2002).

## **Least Tern (Listed Endangered)**

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The least tern (*Sterna antillarum*), listed as endangered, is the smallest of the Northern American terns. The historical range of the interior population of least terns extends through the central United States, from Texas to North Dakota. The breeding range of least terns includes most of the major waterways throughout the Midwest, including the Platte River in Nebraska (NGS 1987). Least terns nest on sandy substrate of riverine sandbars along the Platte River, in adjacent sandpits associated with sand and gravel operations, and on the shores of Lake McConaughy. Least terns have occasionally bred in southern Colorado around lakes and reservoirs, but are typically transitory migrants in eastern Colorado (USFS 1995). The wintering range of least terns is not well known, but is thought to include the coasts of Central and South America (NGS 1987).

Least terns generally arrive at nesting sites on the Platte River by mid-May. Nesting is usually initiated from mid- to late May, and eggs hatch by late June. Migration to wintering sites occurs from August to September. Interior least terns prefer nest sites with little to no vegetation. Terns have been noted to use nest sites with vegetative cover of 11 to 30 percent. Nests are located on sandbar islands, as well as shoreline bars without a channel on both sides of the colony. Sandbars used by least terns have been characterized to average 59 meters wide by 259 meters long. Nests on average are located 33 centimeters above river stage and about 19 meters from the nearest channel (USFS 1995). The location of nests provides good visibility for detection of predators and isolation from human disturbance. Nest sites in sandpits have similar substrate and vegetation characteristics, but lack the isolation that sandbar islands provide. Nests are generally constructed by scraping a depression in the sandy or gravelly substrate (Stokes 1996). Piping plovers share nesting habitat with least terns, because the two species require similar habitat (USFS 1995).

Least terns of the interior population feed primarily on small fish taken near the surface of shallow waters. Platte River fish commonly consumed by least terns include shiners, white sucker, carpsucker, plains killifish and minnows. Terns typically forage within one mile of their nest sites. Least terns nesting in sandpits will fly to foraging areas along the river. Recent studies have indicated that the availability of forage fish for least terns is not a limiting factor for their recovery (USFS 1995).

The least tern surveys conducted by the Nebraska Game and Fish have indicated variable populations from Lexington to Grand Island (USFS 1995). From 1979 to 1989, nesting terns ranged from 0 to 38 birds in the riverine Platte River reach between Lexington and Grand Island. Least terns that used sandpits along the same reach during the same time period ranged from 4 to 118 birds, with a slight upward trend in populations. The recovery plan calls for the establishment of 750 adult breeding pairs on the Platte River for a period of 10 years. Recovery plan actions also call for the protection and restoration of nesting habitat. Essential habitat has been identified as the Big Bend reach between Lexington and Grand Island, Nebraska (USFWS 1984).

The decline in least tern populations is thought to be the result of several factors. Changes in stream flow throughout the least terns' range, including the Platte River, are believed to have reduced habitat and disturbed nesting. Historical annual flows have been reduced substantially during the past 100 years, and as a result, channel widths have been reduced, sandbar accretion has decreased, and encroachment of woody vegetation has increased. Increasing riparian vegetation has reduced the number of suitable nesting sites along the Platte River. The establishment of woody riparian vegetation has improved the biodiversity for other bird species, but to the detriment of least terns. Current sporadic spring flows occasionally inundate nest sites, drowning fledglings and causing abandonment of nest sites. Low flows during nesting can provide access to sandbar islands by terrestrial predators, and increase human disturbance. Predation by coyotes, dogs, gulls, foxes, skunks, raccoons, and other predators can have a serious impact on nesting success. Recreational disturbances from all-terrain vehicles, hikers, and pets have also been known to disrupt least tern nesting.

## **Mexican Spotted Owl (Listed Threatened)**

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The Mexican spotted owl (*Strix occidentalis lucida*) was listed as a threatened species on March 16, 1993. The historic range of the owl extended from the southern Rocky mountains in Colorado and the Colorado Plateau in southern Utah southward through Arizona, New Mexico, and far western Texas, through the Sierra Madre Occidental and Oriental, to the mountains at the southern end of the Mexican Plateau. The present range is thought to be similar to historic range. Populations in Arizona are patchily distributed and occur in all but the arid southwestern portion of the state or much of the lowland riparian zones.

Spotted owls require stands with high canopy closure for thermal regulation and hiding cover. They are intolerant of high temperatures and are stressed at temperatures above 80 to 87 degrees Fahrenheit (27-31 deg C). Spotted owls tend to roost in small trees in the forest understory during warm weather and high up in the large trees during cold or wet weather. The layered canopy structure in old forests provide both types of roosts (FEI 2003b).

The Mexican spotted owl occupies a variety of vegetative habitats but these usually contain certain common characteristics. These characteristics include high canopy closure, high stand density, and a multilayered canopy resulting from an uneven-aged stand. Other characteristics include downed logs, snags, and mistletoe infection that are indicative of an old grove and absence of active management. Much of the owl habitat is characterized by steep slopes and canyons with rocky cliffs (GN 2003b).

Like the other two subspecies of spotted owl, California and Northern, *Strix occidentalis lucida* has suffered extensive population declines, primarily resulting from extensive logging of ancient forests, associated roadbuilding, and other forest development. It has also been negatively impacted by domestic livestock grazing and the widespread devastation grazing has had on the rare and invaluable riparian forests of the Southwest. By the late 80's only 2,000 Mexican spotted owls were estimated to remain in the world (BD 2003).

Competition with barred owls (*Strix varia*) may be displacing spotted owls in some areas. Relative density of barred owls is high in many areas of the spotted owl's range. Further habitat fragmentation may increase displacement. Hybridization between the two species has also been documented.

The U.S. Fish & Wildlife Service listed the owl on March 16, 1993 without critical habitat. A final rule designating critical habitat for the owl was published on June 6, 1995. As a result of several court rulings, the Service removed critical habitat designation for the owl on March 25, 1998. On March 13, 2000, the Service was again ordered to propose critical habitat within 4 months of the court order and to complete a final designation by January 15, 2001. Thus, the Service has now designated approximately 4.6 million acres of critical habitat for the owl in Arizona, Colorado, New Mexico, and Utah, on Federal Lands (USFWS 2003b).

## **Mountain Plover (Proposed Threatened)**

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On February 16, 1999, the Fish and Wildlife Service proposed to designate the mountain plover (*Charadrius montanus*) as a threatened species. The mountain plover belongs to the order Charadriiformes, the shorebirds, and the family Charadriidae, along with the killdeer and several other plovers. Mountain plover is the endemic plover of the shortgrass prairie. The species is known to occur in: Arizona, California, Colorado, Kansas, Montana, North Dakota, Nebraska, New Mexico, Nevada, Oklahoma, South Dakota, Texas, Utah, Wyoming; Canada, Mexico.

Mountain Plovers will breed in shortgrass prairie where the topography is fairly flat (slopes  $<5\frac{1}{4}$ ) with very short (5 cm; 2 in) and sparse vegetation. They are often found where vegetation height and density have been reduced through grazing by livestock or prairie dogs. Average bare ground cover in studies of plover territories ranged from 17% to 100%. They will also nest in areas with low, sparse shrubs. Plovers will forage and nest in agricultural fields that are bare or contain short vegetation, but will abandon the nests if the vegetation grows too tall (i.e., above about 5 cm; 2 in) (PIF 2003).

Breeding occurs in Colorado, Montana, Wyoming, Oklahoma, Utah, New Mexico, Nebraska, and Texas (in order of breeding abundance). Current information also shows a very small number of breeding birds in Mexico. Most breeding plovers occur in Colorado, Montana, and Wyoming with many fewer in other states. One-half the entire population may breed in Colorado. Distribution in Colorado is primarily on the Eastern Plains and Park County, however a few breeding birds have been observed in Costilla, Conejos, Moffat, and Rio Blanco counties. Historically, the Pawnee National Grassland was considered the breeding stronghold in Colorado and perhaps for the entire population. New breeding sites found since 1995 suggest that the plover may be more widely distributed in Colorado than previously known with additional birds noted in South Park. Plovers occupy breeding range from about April 1 through August 1. Current known wintering concentration is California, primarily in the Imperial Valley and Central Valley. Fewer (less than hundreds rather than thousands as in California) mountain plovers have been reported from Arizona, Texas, and Mexico. Plovers occupy winter sites in California from mid-October to mid-March (Hunting 2003).

The decline in population is due to a combination of factors --reduced populations of prairie dogs and other burrowing mammals, loss of plover nests to cultivation, adoption of uniform domestic livestock grazing strategies and conversion of grasslands and other habitats on breeding and wintering grounds.

The Forest Service and the Bureau of Land Management have used prescribed burning to maintain the needed short-grass habitat at both breeding and wintering sites. The use of fire promotes short-grass habitat that attracts mountain plovers to sites that would otherwise not provide suitable breeding or wintering habitat. The Forest Service and the Bureau of Land Management have also incorporated some time-of-year and spatial buffers to protect nesting mountain plovers when granting leases for oil and gas

development. The Fish and Wildlife Service and the Colorado Division of Wildlife are using a Memorandum of Agreement to pursue conservation of the mountain plover in Colorado. State and Federal agencies and private groups have conducted surveys in recent years to better describe the distribution of the mountain plover and the potential threats to its survival. Some states have designated the mountain plover as a species of special concern to promote attention to its conservation needs.

## **Pallid Sturgeon (Listed Threatened)**

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The pallid sturgeon (*Scaphirhynchus albus*), listed as endangered, was first recognized as a species in 1905, although little is known about its early abundance and distribution (Pflieger 1975). It is confined principally to the Missouri and lower Mississippi rivers. Pallid sturgeon prefer large river habitats, where they live in strong currents over sandy or gravelly bottoms. This species' historical range was the Missouri River from Montana to the Mississippi River, and the lower Mississippi River downstream of the Missouri River (Page and Burr 1991). Pallid sturgeon are also found in the lower Yellowstone River in Montana (USFS 1995). There are records of pallid sturgeon collected just upstream of the mouths of large tributary streams during high flow conditions. Current distribution includes most of its historical range, but in reduced numbers (USFS 1995). Pallid sturgeon can live to be over 40 years old and can reach lengths of 168 cm (McClane 1978), although individuals that large are now uncommon. They feed on both invertebrates and small fish (Coker 1930).

Reasons for the decline of the pallid sturgeon are thought to be habitat loss, commercial harvest, pollution and contaminants, and hybridization. Destruction and alteration of habitats by human modification of the river system is believed to be the primary cause of declines in reproduction, growth, and survival of pallid sturgeon (Dryer and Sandvol 1993). Reservoir construction, stream channelization, and effects of upstream reservoirs on natural flow regimes caused habitat loss (USFS 1995). Reservoirs located within the sturgeon's range are thought to block migration to spawning and feeding areas, as well as downstream larval drift. It is unlikely that successfully reproducing populations of pallid sturgeon can be recovered without restoring the habitat elements (morphology, hydrology, temperature regime, cover, and sediment/organic matter transport) (Dryer and Sandvol 1993).

During spawning season, pallid sturgeon are known to stage at the mouth of the Platte River, Nebraska, and probably use such large tributaries for spawning purposes (USFS 1995). Both shovelnose sturgeon and paddlefish spawning migrations occur in response to increased flows in June. Although there is no information on pallid sturgeon spawning migrations, it is assumed these migrations would occur similarly, in response to increased June flows (Dryer and Sandvol 1993). Spawning is believed to occur between June and August. No reproduction has been documented within the last 10 years in the upper Missouri River, and for 6 to 7 years in the lower Missouri (USFS 1995).

Before impoundment behind Missouri River reservoirs, peak discharges generally occurred in April, and then again with a larger peak in June. Today, dam operations reduce flows from April to July for flood control, and increase flows from July to April for navigation, water supply, and hydropower (Dryer and Sandvol 1993). Flood flows were essential for dynamic transport of sediment and rearrangement of the sediments into natural morphologic channel features (fish habitat); floods served to introduce and transport organic matter from the floodplain, and to maintain turbidity. Flood flows were the principal method for introducing large woody debris, and they carried nutrients to

floodplain plant communities, which determined floodplain forest composition and structure. Invertebrate reproduction and behavioral migration were closely tied to the natural hydrograph (Dryer and Sandvol 1993).

Pallid sturgeon are known to hybridize with shovelnose sturgeon. Hybridization was not reported in studies conducted in the 1950s but was reported in the mid-1980s. It is theorized that hybridization may be a recent phenomenon that is partially attributable to habitat modification and related behavioral changes (USFWS 1992).

Another primary factor is the decline of native forage fish upon which the large sturgeon depends for food. Declines in benthic-dwelling native fishes such as the flathead chub, in part resulting from habitat alteration and water development, have most likely contributed to the decline of the pallid sturgeon (USFS 1995).

Both short- and long-term recovery objectives have been identified for the pallid sturgeon. Short-term objectives are to prevent extirpation of wild populations. Long-term goals are to establish a self-sustaining population in the recovery management area by the year 2040 (USFWS 1992). Recovery-priority management areas include the Missouri River 20 miles upstream and downstream of the Platte River. One point of the recovery outline includes implementing operational alternatives for mainstem Missouri River and tributary dams using simulation models that will emulate pre-control hydrographs. It is essential that the temporal and spatial patterns be restored, at least in part, to recover the pallid sturgeon (Dryer and Sandvol 1993).

## **Pawnee Montane Skipper (Listed Threatened)**

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On September 25, 1987, the Pawnee montane skipper (*Hesperia leonardus montana*) was designated as a threatened species by the Fish and Wildlife Service. The skipper, a member of the Hesperidae butterfly family, was first described in 1911 as *Pamphila (Hesperia) pawnee montana*. The subspecies occurs only in the South Platte Canyon River drainage system in Colorado, involving portions of Jefferson, Douglas, Teller, and Park Counties.

The skippers occur in dry, open, ponderosa pine woodlands. The slopes are moderately steep with soils derived from Pikes Peak granite. The understory is very sparse in the pine woodlands. Blue grama grass, the larval food plant, and *Liatris*, the primary nectar plant, are two necessary components of the groundcover strata. Small clumps of blue grama occur throughout the hot, open slopes inhabited by skippers. *Liatris* occurs throughout the ponderosa pine woodlands. Skippers are very uncommon in pine woodlands with a tall shrub understory or where young conifers dominate the understory.

The skipper has a restricted range, occupying an area (though not necessarily all the available habitat within it) roughly 23 miles long and 5 miles wide. It occurs along the mainstem of the South Platte River for approximately 20 miles and the North Fork of the South Platte River for approximately 15 miles upstream from their confluence to Cheesman Reservoir and Crossons, respectively. The present range covers approximately 38 square miles. Currently, the skipper's habitat forms one continuous band along the North and South Forks of the South Platte River and some of their tributaries, Buffalo and Horse Creeks, respectively. This type of habitat configuration allows for an interchange of individuals throughout the habitat. The area occupied by the skipper is owned and/or administered by the USFS, Denver Water, Bureau of Land Management, Jefferson County, State of Colorado, and numerous private individuals.

The 1985 population estimate was 80,000 to 140,000 individuals; in 1986, the estimate was 67,900 to 166,100; and in 1987, the estimate was 116,000 individuals. These estimates are believed to be current, although no more recent surveys are known.

Since modern settlement of Colorado, the Platte River Canyon has experienced a number of habitat changes that likely have resulted in loss, modification, and curtailment of former skipper habitat and range. Habitat loss likely has occurred as a result of fire suppression over the last 120 years. The encroachment of conifers and the subsequent loss of grasses and *Liatris* has reduced the quality and quantity of skipper habitat. Causes of lost habitat include Cheesman Reservoir, residential development, roads, and planted and mowed pastures. Invasion of noxious weeds, such as knapweed, which may outcompete blue grama and *Liatris*, are also a serious threat to the skipper (USFWS 2003c).

## **Piping Plover (Listed Threatened)**

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The interior population of the piping plover (*Charadrius melodus*) is listed as threatened. This is one of the smallest shore birds. Historically, piping plovers have used three geographic areas for breeding: the Atlantic coast, the Great Lakes beaches, and the Northern Great Plains. In Nebraska, piping plovers have historically used the sandbars along the Missouri, Platte, Niobrara, and Loup Rivers for breeding. Piping plovers are found on the Platte River from Lexington, Nebraska to the Missouri River, and they have also used Lake McConaughy for breeding. Piping plovers are primarily migrants in eastern Colorado during May to June and August to October. Nesting in Colorado is rare, although the first recorded breeding in 40 years occurred on a lakeshore in Kiowa County in 1989 (USFS 1995).

Piping plovers are migratory shore birds that spend approximately 3 to 4 months in the northern U.S. and southern Canada. Winters are spent on the south Atlantic and Gulf coasts. Nesting on the Platte River begins in mid- to late May, and eggs hatch about the last week of June. Birds typically leave the breeding ground in late July to early September. Breeding estimates in Nebraska, except for the Missouri River area, were 167 pairs in 1985–1987 (USFS 1995). The primary diet of plovers includes insects, worms, crustaceans, and other invertebrates foraged from the sandy substrate in the vicinity of nest sites (Stokes 1996).

Nesting habitat requirements are open, sparsely vegetated areas along sand and gravel shores of rivers and lakes. On the Platte River, piping plovers typically nest on the barren riverine sandbars isolated by water, but will utilize shorelines without a channel on both sides of the colony. Plovers typically select nest sites near the high point of the sandbar, and, being territorial, they space their nests at least 60 meters apart (Stokes 1996). Nesting sites generally have less than 25 percent vegetative cover. Plovers will also nest in sandpits at sand and gravel operations and along the shorelines of lakes (Stokes 1996; USFS 1995). Piping plovers typically nest commingled with least terns, which utilize similar nesting habitat. Between 1984 and 1989, 32 to 50 percent of piping plover nest sites occurred in sand pits along the Platte River (USFS 1995).

The decline in piping plover populations is suspected to be related primarily to habitat alteration and destruction. The loss of open sandy beaches and sandbars due to modification in river flows and the encroachment of vegetation has reduced nesting habitat and reproductive success. Low flows can increase the possibility of predation and human disturbance. High flows can reduce the potential for optimum nest sites and potentially inundate nests. High river flows in 1986 resulted in a 76 percent loss of piping plover eggs at monitored colonies. Vegetation encroachment has increased as high peak flows that once scoured river sandbars have been reduced, and flow modification has increased riparian moisture conditions during historically dry summer periods. Reservoirs have also reduced the amount of sediment load that formerly provided material for formation of sandbars. Other factors affecting breeding success include predation, increased human use of beaches, and cattle trampling in nest habitat.

In 1988, a recovery plan was developed to assist with the protection and recovery of piping plovers. Efforts to protect the breeding population in Nebraska have focused on quantifying available habitat, identifying Platte River flow regimes necessary to protect and enhance nesting habitat, and vegetation clearing to increase breeding habitat. The recovery goal for the Platte River is to maintain a population of 140 pairs for 15 years. Essential breeding habitat on the Platte River has been identified as all existing and recurring sandbars suitable for piping plover nesting from Lexington to the Missouri River.

## **Preble's Meadow Jumping Mouse (Listed Threatened)**

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The Preble's meadow jumping mouse (*Zapus hudsonius preblei*) is a small rodent in the family Zapodidae. It is known to occur in only four counties in Colorado and two counties in Wyoming. The Preble's mouse, a hibernating small mammal, lives primarily in heavily vegetated riparian habitats. Habitat loss and degradation caused by agricultural, residential, commercial, and industrial development imperil its continued existence. On May 13, 1998, the USFWS listed the Preble's mouse as a threatened species (USFWS 1998). The USFWS is currently working with the Colorado Division of Wildlife, the U.S. Department of Energy, Rocky Flats Field Office, and other interested parties to develop a Collaborative Action Plan that will ensure preservation of Preble's mouse habitat in Colorado.

Approximately 80 field sites, many where the mouse had been documented in the past, have been sampled since 1991 in search of the Preble's mouse, but most of these searches did not document its presence. Historical records originally documented the former range of the mouse in eight counties in Colorado and three counties in Wyoming. The current distribution in Colorado includes Boulder, Jefferson, Douglas, and El Paso Counties. In Wyoming, they have been confirmed in Laramie and Albany Counties. Current information on the range of the Preble's mouse indicates that the subspecies does not occur in the lower Platte River drainage (USFWS 1997). During field work conducted since this information was published, additional populations have been located in Colorado.

The Preble's mouse has been recorded in all creek drainages at the Site, in association with riparian woodland, riparian shrubland (*Salix* dominated), and tall upland shrubland (*Prunus* and *Crataegus* dominated). This species is most strongly associated with the Great Plains riparian complex and adjacent grasslands of the creek bottomlands, where water is readily available. Although the tall upland shrubland community at the Site is quite different from the riparian zone, the mouse is also present in portions of the tall upland shrubland. This is most likely because the tall upland shrubland is closely associated with active hillside seeps that provide the apparently requisite water source for the mouse. For further information on the Rocky Flats population of the Preble's mouse, refer to the trapping study reports on this species (K-H 1996a,b) that have been provided to the regional USFWS offices.

## Whooping Crane (Listed Endangered)

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Whooping cranes (*Grus americana*), listed as endangered, are the tallest bird in North America and one of the rarest. Their historical range is thought to have extended from the Arctic coast to central Mexico, and from Utah to the East Coast. The historical breeding range extended from central Illinois into northern Canada. Currently, the only viable wild breeding population is found in the Wood Buffalo National Park in the Northwest Territories of Canada. This flock migrates annually through a fairly narrow Midwest corridor to its wintering site at the Aransas National Wildlife Refuge on the Texas coast (NGS 1987). The Platte River Valley between North Platte and Grand Island is often used as a resting and feeding area along the migration route. The breeding population of the Wood Buffalo/Aransas flock has varied from 133 in 1988, to 150 in 1989, to 134 in 1991 (USFS 1995). Migrant whooping cranes are flexible in their selection of stopover sites and will utilize a variety of habitat types. Data suggest a preference for palustrine wetlands, small ponds, or marshes for roosting. Along the Platte River, whooping cranes utilize riverine habitat for roosting, and agricultural fields and wetlands for feeding (USFS 1995).

Whooping cranes are diurnal migrants that stop often to rest and feed between the nesting and wintering grounds. Most (76.5 percent) migration stopovers are overnight stays of 12 to 16 hours. Spring migration through the Platte River region generally occurs between March 29 and April 20 (75 percent of sightings) (USFS 1995). Whooping crane sightings on the Platte River are more frequent during the spring migration (63 percent) than during fall migration. Fall migration observations (85 percent) have been noted between October 12 and October 27. Between 1907 and 1989, there have been 65 confirmed whooping crane sightings in the Platte River region. The number of whooping cranes observed on the Platte River between 1964 and 1985 was equivalent to about 1 percent of the corresponding stopover opportunities by migrating cranes (USFS 1995). Whooping cranes apparently utilize other stopover sites in Nebraska, in addition to the Platte River, during their biannual migrations.

The Platte River reach between Lexington and Denman, Nebraska was designated as critical habitat for migrating whooping cranes in 1978. This stopover reach provides feeding and roosting habitat for cranes on their way to nesting or wintering sites. Roosting habitat is generally selected according to the level of security provided by the site. Important characteristics of roosting sites include sites free of visual obstructions, water less than 18 inches deep, and an expanse of water wide enough to provide a sense of isolation and security. Whooping cranes have been documented to utilize unobstructed channel widths from 172 to 1,365 feet (USFS 1995). Whooping crane sites are usually free of vegetation, with no tall trees or shrubs to restrict visibility, and a fine or sandy substrate. Whooping cranes have been noted in the Platte River at streamflow rates between 700 and 4,000 cubic feet per second. Suitable sandbars are available in the river at varying flow rates. Roosting sites are typically at least a quarter mile from any human activity zones such as houses and roads (USFS 1995).

Whooping cranes in the Platte River Valley are known to forage in a variety of different habitats, including wet meadows, palustrine wetlands, cropland, and native grasslands. The cranes generally forage within a mile of their roosting sites. Whooping cranes are omnivorous feeders and may eat insects, fish, amphibians, invertebrates, grasses, and grains from agricultural crops (Stokes 1996). Forage consumed during migration stops is thought to supply valuable energy and nutrients until food sources are available at the northern nesting site.

The decline in whooping crane populations is thought to be the result of a variety of factors. The location of breeding grounds above latitude 60 degrees north imposes a short breeding season. Fire or drought in the nesting area can reduce food supplies and reduce the chance of successful breeding. Severe storms in coastal wintering habitat and throughout their range are known to have reduced historical populations. Whooping cranes have a delayed sexual maturity, small clutch sizes, and strong adherence to established nesting areas and wintering grounds, all of which preclude rapid population recovery following setbacks (USFS 1995).

Additional factors thought to affect whooping crane populations include hunting, powerline construction, avian tuberculosis and avian cholera, human disturbances, and habitat modification or loss. Conversion of natural habitat such as potholes, wetlands, and prairies for agricultural uses has eliminated much of the original range utilized by whooping cranes (USFS 1995)

A recovery plan for whooping cranes adopted in 1986 (USFWS 1986) established a goal of increasing the Wood Buffalo/Aransas population to a minimum of 40 nesting pairs by the year 2020, and the total wild population to 90 nesting pairs. The recovery plan also outlines steps to preserve and enhance critical habitat used along migration routes. Since USFWS designated critical habitat in 1978 for the Platte River, efforts have focused on identifying whooping crane habitat needs and protecting and enhancing conditions for crane use. Deterioration of habitat on the Platte River from reduced flows, channel narrowing, loss of sandbars, riparian vegetation encroachment, and human disturbance have all been concerns. Recent efforts have focused on determining minimum stream flows required for roosting habitat, maintenance of wet meadows, and channel maintenance. Conservation measures frequently include clearing riverbed areas of vegetation to increase suitable roosting habitat (Platte River Joint Management Study 1993).

## Colorado Butterfly Plant (Listed Threatened)

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On October 18, 2000, the Colorado Butterfly plant (*Gaura neomexicana* ssp. *coloradensis*) was designated as a threatened species by the Fish and Wildlife Service. The species is a short-lived perennial forb, and is known to occur in Colorado, Nebraska, Wyoming. The plant is limited to approximately 1700 acres of habitat centered in Laramie County, Wyoming, with scattered populations in western Kimball County, Nebraska and Weld County, Colorado. Historically, native populations were also known from Boulder, Douglas and Larimer counties in Colorado, but these populations are believed to be extirpated. Extant populations are restricted to Bear, Crow, Horse, Lodgepole and Spring creeks, all within the North and South Platte River watersheds.

The habitat of this species is subirrigated, alluvial soils on level or slightly sloping floodplains and drainage bottoms, and old, abandoned stream channels with a high water table. Colonies are often found in low depressions or along bends in wide, meandering stream channels. Most populations are found a short distance from the actual channel and may even occur at the base of low, alluvial ridges at the interface between riparian meadows and drier grasslands. Elevation where the species is found ranges from 5000 to 6400 feet.

Periodic disturbance events are necessary to maintain suitable habitat, control competing vegetation, and open bare ground for seedling establishment. Historically, flooding was the most important type of disturbance. Moderate, rotational grazing and haying may be potential management tools to create open habitat (CPC 2003).

## **Ute Ladies'-Tresses Orchid (Listed Threatened)**

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In early 1992, Ute ladies'-tresses orchid (*Spiranthes diluvialis*) was listed as a threatened species. This listing gave the few remaining populations of Ute ladies'-tresses orchid the full protection of the Endangered Species Act just eight years after the plant was recognized as a separate species (USFS 1995). No critical habitat has been designated.

The Ute ladies'-tresses orchid inhabits moist soils in mesic or wet meadows near springs, lakes, and perennial streams, usually sites where the surrounding vegetation is not extremely dense, overgrown, or overgrazed. The habitat at some sites has been enhanced by irrigation. All known populations are between elevations of about 4,500 and 7,000 feet (USFS 1995).

The relatively poor competitiveness of Ute ladies'-tresses orchid in densely overgrown meadows indicates that the orchid requires periodic removal of competing vegetation. Under natural conditions, this may have been accomplished by grazing, fire, or some other phenomenon. In Boulder County, Colorado, the populations are winter grazed and then hayed in late June. This regimen seems to keep population numbers high, but studies are in progress and results are preliminary (USFS 1995).

During the mid- and late 1980s, new populations of Ute ladies'-tresses orchid were actively sought, mostly by J. Coyner in Utah, and W. Jennings in Colorado. In Colorado, plants were known only from along Clear Creek in Jefferson County. In 1985, a few plants were found in Boulder County. In 1986, a large population was located nearby on City of Boulder Open Space land. The Boulder County populations are the closest to the Site. None are known to exist immediately downstream of the Site. Searches since 1991 have failed to document the presence of Ute ladies'-tresses at the Site, but suitable habitat does exist (ESCO 1993, 1994).

In Utah, new populations were found in the Uinta Basin of northeastern Utah. In 1989, a significant new population was discovered at Dinosaur National Monument. In 1993 and 1994, new populations were found in Wyoming (two sites) and reportedly in Montana (one site), but there are some questions about the exact identity of the specimen (USFS 1995).

There were several primary reasons for listing the species. Ute ladies'-tresses orchid has been adversely affected by modification of its riparian habitat, primarily by urbanization in the Denver and Salt Lake City areas, or by heavy agricultural use in rural areas. About half of the populations originally documented by specimen no longer exist. Extant populations are usually very small and vulnerable to habitat changes. At the time of listing, fewer than 6,000 plants were known in 10 populations. The number of blooming plants fluctuates greatly from year to year, making it more vulnerable to extinction. Many orchid species take many years to reach maturity, and reproductively mature plants do not flower or set seed every year. Under natural conditions, reproduction appears to be very low. Herbivory may be a significant threat, although moderate grazing is thought to be beneficial at some Boulder County sites, where it prevents competing vegetation

from crowding out or shading out the Ute ladies'-tresses orchid. Cattle are known to eat the species, as are small rodents (USFS 1995).

## **Western Prairie Fringed Orchid (Listed Threatened)**

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The western prairie fringed orchid (*Platanthera praeclara*) is listed as a threatened species. This species occurs in wet prairie habitats. It was historically distributed throughout much of the western Central Lowlands and eastern Great Plains physiographic provinces of the central United States and the Interior Plains in extreme south-central Canada (USFWS 1999). Comparison of the historical and extant ranges shows that the species has apparently been extirpated from South Dakota, with significant reductions in counties of occurrence in Missouri, Iowa, southeastern Kansas, and eastern Nebraska.

Historical (observed prior to 1970 and/or confirmed destroyed), extant (observed since 1970), and unverified reports exist for more than 203 sites in 109 counties in eight states and one Canadian province. Current populations of the fringed orchid are known in six states.

The fringed orchid has declined significantly throughout its historical range, largely because of habitat loss and degradation (USFWS 1999). Conversion of prairies for row crops, fire suppression, haying, and land development are factors that contributed to the species' decline. Annual mowing of prairies for hay is a common practice in Kansas, Nebraska, and South Dakota. This practice, which typically occurs prior to the maturation of the fringed orchid's fruits, may have contributed to the decline of the species. Stream channelization and draining of seasonally wet prairies in the Nebraska and South Dakota Sandhills probably affected the species adversely by altering the hydrologic regime. In most instances, channelization and draining were done to permit reliable access to wet prairies for hay. Other agricultural practices, such as grazing and herbicide use, also may have affected the species.

The fringed orchid occurs on wet-mesic, subirrigated prairies and sedge meadows along the floodplain of the Platte River, with the only known population on Mormon Island Crane Meadows, in Hall County, Nebraska. Peak flows in the Platte River have been greatly diminished during the past century, facilitating conversion of most low-lying areas near the river from grassland to intensive agriculture. Consequently, little habitat remains that is suitable for the fringed orchid.

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**Appendix C: Historical Correspondence with USFWS**



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Ecological Services  
755 Parfet Street, Suite 361  
Lakewood, Colorado 80215



IN REPLY REFER TO:

ES/CO:DOE/RockyFlats  
Mail Stop 65412

JUL 12 2000

Joseph A. Legare  
Department of Energy  
Rocky Flats Field Office  
P.O. Box 928  
Golden, Colorado 80402-0928

00 JUL 18 PM 2:42  
CCDM

Dear Mr. Legare:

This regards the Programmatic Biological Assessment (BA) for Department of Energy (DOE) Activities at the Rocky Flats Environmental Technology Site. The U.S. Fish and Wildlife Service (Service) received Part I of the BA with your letter dated August 3, 1999. Part I describes actions that you believe will have no effect on federally-listed endangered and threatened species, and actions that may affect, but will be unlikely to adversely affect those species. Part II of the BA was received with your letter of December 20, 1999. It describes additional actions that are likely to adversely affect federally-listed species and other actions whose effects could not yet be determined.

A meeting was held on May 5, 2000, to discuss both portions of the BA. Cliff Franklin and John Stover of DOE were among those present. During that meeting the Service agreed to provide concurrence with those actions described in Part I of the BA that we agree will have no effect, or may affect but are not likely to adversely affect listed species. It was also agreed that other actions described in Part I of the BA and actions described in Part II of the BA will be addressed in a revised BA developed by DOE on actions likely to adversely affect listed species.

The following comments have been prepared under the provisions of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et. seq.). Based on the information provided in Part I of the BA, the Service concurs that the following actions will have **no effect** on the Preble's meadow jumping mouse, *Zapus hudsonius preblei*, (Preble's) or other listed species. Actions are keyed to section numbers in Part I of the BA. Limitations of concurrence are provided in italics where required.

2. Routine Activities that will Continue Until Closure
  - 2.1.1 Surface Water Monitoring

5476

- 2.1.3 Watershed Pollutant Source Control - *When conducted outside of Preble's habitat.*
  - 2.2 Groundwater Monitoring
  - 2.2.1 Well Abandonment and Replacement Program - *When conducted outside of Preble's habitat.*
  - 2.2.2 Installation of Contaminant Plume Monitoring Wells - *When conducted outside of Preble's habitat.*
  - 2.3 Air Quality Monitoring
  - 2.4 Building 891 Waste Water Treatment Facility
  - 2.5.1 Waste Water Treatment Plant - *As currently operating in regard to flow rate and water quality. This does not include water depletion issues.*
  - 2.5.2 Disposition of Incidental Waters
  - 2.5.3 Disposition of Internal Water Streams
  - 2.6.1 Routine Sanitary Waste Disposal
  - 2.6.2 New Sanitary Landfill
  - 2.7 Interceptor Trench System
  - 2.8 Process Water Treatment
  - 2.9 Routine Administrative and Infrastructure Support Activities - *This does not include water depletion issues.*
  - 2.10 Utilities
  - 2.10.1 Water Treatment Plant - *This does not include water depletion issues.*
  - 2.11 Waste Storage
  - 2.11.1 Low-Level Waste Storage
  - 2.11.2 Transuranic Waste and Transuranic Mixed Waste Storage
  - 2.11.3 Plutonium Storage and Stabilization - Routine Activity
  - 2.11.4 Plutonium Storage
  - 2.11.5 Salt Residual Storage
  - 2.11.6 Liquid Storage Project
  - 2.11.7 Liquid Removal
- 3. Buildings to be Decommissioned in the Buffer Zone and Peripheral Areas
    - 3.1 The SECBZO Cluster
    - 3.2 The INFMET Cluster
    - 3.3 The 130 Cluster
    - 3.4 The Deactivated Sanitary Landfill - *This does not include water depletion issues related to landfill pond operations.*
- 5. Building Decommission Projects in Areas Peripheral to the Industrialized Area Including clusters described in 5.1 - 5.3.
- 6. Industrial Area Building Removal and Associated Remedial Actions - Including Clusters described in 6.1 - 6.21. *Evaluation of IHSS characterization and remediation activities is not included.*

7. Industrial Area Building Removal Without Associated Remedial Actions - Including Clusters described in 7.1 - 7.9. *Further remedial activities not included.*
8. Recycling of Concrete from Building Rubble

The Service is unable to concur with a "no effect" determination for the following actions. In some cases a further explanation or more detail might lead to Service concurrence.

- 2.1.2 Pond Operations - This includes transfer of wastewater/stormwater between interior ponds and discharges from terminal ponds, and maintenance and repair of dams. As described, Pond Operations appears to include activities that may affect Preble's.
4. IHSS Remediation Projects in the Buffer Zone - As described, this includes a range of future actions for which specific plans, and thus potential to affect species, have not yet been developed.

Based on the information provided in Part I of the BA the Service concurs that the following actions **may affect, but are not likely to adversely affect**, Preble's or other listed species. As before, actions are keyed to sections of Part I of the BA. Limitations of concurrence are provided in italics where required.

- 9.1 Routine Road Maintenance
- 9.2 Weed and Vegetation Management - *For management through mechanical means, chemical means, or through prescribed burning Service concurrence is limited to management that occurs clearly outside of Preble's habitat.*
- 9.4 Ecological Monitoring - *Research activities regarding Preble's may result in adverse affects to Preble's and are not covered by this concurrence (but are generally permitted under an existing section 10 permit).*

The Service is unable to concur with a "may affect, not likely to adversely affect" determination on the following action.

9.3 Dam Mowing - As broadly described, Dam Mowing appears to include activities that are likely to adversely affect Preble's. Such actions done clearly outside of Preble's habitat are not likely to adversely affect Preble's. For specific actions, limitations such as timing and height/extent of mowing may avoid adverse affects to Preble's. We recommend that dam mowing, along with related pond maintenance activities, be addressed through the proposed programmatic consultation process.

We look forward to working with DOE to address additional activities at Rocky Flats through the programmatic consultation. If you have questions regarding the content of this letter, please contact Peter Plage of this office at (303)275-2370.

Sincerely,

A handwritten signature in cursive script, appearing to read "LeRoy W. Carlson".

LeRoy W. Carlson  
Colorado Field Supervisor

cc: FWS/FWAO (B. Rosenlund)  
Plage

Reference: Peter\DOE\2000.5



## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Ecological Services  
Colorado Field Office  
755 Parfet Street, Suite 361  
Lakewood, Colorado 80215

IN REPLY REFER TO:

ES/CO: DOE/RockyFlats  
Mail Stop 65412

NOV 27 2001

Joseph Legare  
Rocky Flats Field Office  
10808 Highway 93, Unit A  
Golden, Colorado 80403-8200

RE: Vegetation Management on Water Control Structures

Dear Mr. Legare:

The Fish and Wildlife Service (Service) has received your letter of October 23, 2001, regarding Vegetation Management on Water Control Structures. Based on the project description and location, the Fish and Wildlife Service concurs that the project will have no effect on the bald eagle (*Haliaeetus leucocephalus*), least tern (Interior population) (*Sterna antillarum*), piping plover (*Charadrius melodus*), whooping crane (*Grus americana*) and its critical habitat, pallid sturgeon (*Scaphirhynchus albus*), Eskimo curlew (*Numenius borealis*), western prairie fringed orchid (*Platanthera praeclara*), American burying beetle (*Nicrophorus americanus*), Ute ladies'-tresses orchid (*Spiranthes diluvialis*), and the Colorado butterfly plant (*Gaura neomexicana coloradensis*). Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

The Service concurs with your determination that activities *which occur clearly outside its habitat* are not likely to adversely affect the Preble's meadow jumping mouse, *Zapus hudsonius preblei* (Preble's). In addition, the following activities *within Preble's habitat* are not likely to adversely affect Preble's:

1. Mowing vegetation to 3 inches tall over a combined area of 3.01 acres (section 2.2.1.1) and 0.052 acres (section 2.2.1.4), provided that these areas have been historically mowed;
2. Trimming vegetation to 12 inches tall over a combined area of 0.05 acres at two dams (section 2.2.1.2);
3. Temporary piling of brush at designated locations;

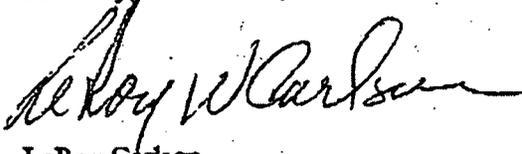
4. Vegetative removal in riprap (see below) of 0.13 acres by mechanical means (section 2.2.1.6), and of 0.39 acres by herbicide (section 2.2.2);

5. Routine road maintenance (sections 2.1 and 2.2.3) such as grading.

Please note that the 1999 Preble's Survey Guidelines indicate that "portions of stream channels diverted underground, armored with concrete, or covered with riprap so as to exclude *significant* vegetation" (emphasis added) are not considered habitat. Because the project entails vegetative removal from areas of relatively sparse cover (5 stems per m<sup>2</sup>), the Service concurs that the activities outlined are not likely to adversely affect Preble's. Areas with higher densities may constitute an adverse effect and are not covered by this concurrence.

If you have further questions, please contact Ari Cornman of this office at (303) 275-2359.

Sincerely,



LeRoy Carlson  
Colorado Field Supervisor

cc: Cornman  
Plage  
Linder

Reference: My Documents\General Consultations\Rocky Flats

**Vegetation Management on Water Control Structures and  
Related Actions in Preble's Mouse Habitat**

**U.S. Department of Energy  
Rocky Flats Field Office  
Golden, Colorado**



**September 2001**

## 1. Introduction

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A number of routine activities at Rocky Flats Environmental Technology Site (the Site) occur in or adjacent to the habitat of the federally listed Preble's meadow jumping mouse (Preble's mouse; *Zapus hudsonius preblei*). These activities are restricted to within the boundaries of the Site, and do not affect surface water volumes. These actions have been the subject of separate informal consultations between the Department of Energy (DOE) and the U.S. Fish and Wildlife Service (USFWS) for several years, and are presented here to consolidate information for a more comprehensive discussion. This consultation is in keeping with a 1999 cooperative agreement between DOE and USFWS (DOE & USFWS 1999) regarding how consultation at the Site will proceed.

Because these actions will not affect water depletions onsite or within the greater Platte River basin, no effects on lower Platte River species are likely to occur from these onsite actions. Lower Platte River species considered in this evaluation included the piping plover (*Charadrius melodus*), the least tern (*Sterna antillarum*), the whooping crane (*Grus americana*), the pallid sturgeon (*Scaphirhynchus albus*), the Eskimo curlew (*Numenius borealis*), the American burying beetle (*Nicrophorus americanus*), and the western prairie fringed orchid (*Platanthera praeclara*). In addition to examining lower Platte River species and the Preble's meadow jumping mouse to determine impacts, other species listed below were investigated. The American peregrine falcon (*Falco peregrinus*) was withdrawn from consideration after delisting (FR 1999a). Because of the bald eagle's (*Haliaeetus leucocephalus*) present status (it is under consideration for delisting; FR 1999b), and because it is only a casual user of the Site, DOE actions are unlikely to affect the species. Ute ladies'-tresses (*Spiranthes diluvialis*), or Colorado butterfly plant (*Gaura neomexicana coloradensis*), though they occur in the Site's vicinity, have not been documented on the Site, nor in offsite areas that might be affected by these actions (ESCO 1993, 1994). These activities have been determined to have no effect on these species.

## 2. Description of Programmatic Elements Assessed

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The programmatic elements discussed in this biological assessment include routine maintenance actions that have occurred on the Site for decades. These actions are separated into two categories in the discussion below: Road Maintenance and Dam Maintenance.

### 2.1 Routine Road Maintenance

Buffer Zone roads and utilities are maintained routinely to ensure that roads are safe for use, and that utilities remain in good operating condition. When dirt and gravel roads become eroded, grading restores proper drainage and reduces siltation that otherwise

could reach streams and affect the aquatic ecosystem. Some Buffer Zone roads serve as fire breaks, providing barriers to interrupt the spread of grassland wildfires that occasionally occur in the Buffer Zone. These roads also serve as access routes for emergency vehicles such as fire protection equipment and Site security forces, as well as for personnel who perform various environmental monitoring activities (e.g., surface water, groundwater, air quality, and ecology). Additional routine maintenance activities that occur periodically in the Buffer Zone include removal of trash and remediation debris.

Some road grading occurs in and adjacent to Preble's mouse habitat. This road maintenance has been conducted routinely for 25 to 50 years, depending on location (Figure 1). Areas where roads are adjacent to or cross Preble's mouse habitat (arrows 1-5 on Figure 1) have been maintained by annual grading for most of the last 50 years. It should be noted that the Landfill Pond dam road is maintained regularly, but is not included in this discussion because it lacks adjacent Preble's mouse habitat, and is not included in any Preble's mouse protection area (Figure 2).

In Area 1 (Smart Ditch drainage), the road was cut more than 30 years ago through a mesic grassland adjacent to the riparian corridor, and the road parallels the stream at a distance of about 100 feet. No actual disturbance occurs within primary Preble's mouse habitat, but the road surface is graded at least annually to maintain it in a safe condition.

In Area 2 (Woman Creek), the road crosses over the creek and passes through known Preble's mouse habitat. Grading remains within the existing decades-old disturbance, and Preble's mice are known to have crossed this road during travel up and down Woman Creek. Roads also pass across the crest of the dam at Pond C-2, and east of the Woman Creek diversion around that pond. These areas are not designated as Preble's mouse protection areas, but are discussed here because they are in the vicinity of Preble's mouse habitat. These roads are periodically repaired by filling low spots, and the dams are sometimes repaired by filling surface depressions or erosion rills on up- and downstream faces as well.

In Area 3 (Walnut Creek), the maintained road crosses over the dam crest for Pond B-4. This road is adjacent to a known Preble's mouse population, which shows no evidence of impact from routine road maintenance and light daily road use. Preble's mice have been shown, through radio tracking, to have crossed and re-crossed this road. This road is periodically repaired by filling low spots, and the dam is sometimes repaired by filling surface depressions or erosion rills on up- and downstream faces as well.

In Area 4 (Walnut Creek), the road parallels the stream that has appropriate habitat, then crosses Dam A-2, and parallels appropriate habitat between Ponds A-2 and A-3. Preble's mouse trapping data indicate that the appropriate habitat between Ponds A-2 and A-3 is used at least periodically by the mouse. The Dam A-2 itself is not included within a Preble's mouse protection area, though designated areas are upstream and downstream. A road also passes along the riparian habitat west of Pond A-1. This road accesses groundwater and surface water monitoring locations, a security installation, and an

underground water treatment system. Periodic repairs are made on this road to maintain safety, but the road is minimally maintained otherwise. Road maintenance has been ongoing in this area for more than 30 years, including maintenance of the access road across the Dam A-2 crest, and this area also experiences light daily traffic from routine water operations and monitoring activities. This road is periodically repaired by filling low spots, and the dam is sometimes repaired by filling surface depressions or erosion rills on up- and downstream faces as well. The Preble's mouse population in this area shows no evidence of impact from these routine activities.

In Area 5 and Area 6, the road passes through the edge of the xeric tallgrass prairie, along the edge of the pediment between grasslands and adjacent tall upland shrubland units that are known to support Preble's mice. Monitoring data indicate that the Preble's mouse populations in these areas are not affected by the routine traffic or road maintenance.

This information has been presented in previous consultation documents, and the USFWS has concurred that this road maintenance is allowable.

## **2.2 Dam Maintenance**

Dams at the Site are required by the "State of Colorado Rules and Regulations for Dam Safety and Dam Construction" (2 CCR 402-1) to be maintained and to be able to pass specific design storm-event water flows. Maintenance includes routine valve exercise and repairs, mowing of crests, toes, and spillways to maintain adequate emergency flow-capacity, and minor repairs and maintenance to dam crests and faces (slopes).

If spillways are not mowed to control vegetation height, the spillways develop reduced flow-capacity due to brush and tree growth. Further, heavy vegetation growth on dam faces and in outlet channels can also threaten dam integrity and can restrict proper water discharge. To prevent the potential of dam failure, which, among other damage, could lead to catastrophic downstream Preble's mouse habitat damage, the Site mows and clears brush from these areas on an annual basis. In addition to concerns about restriction of stormwater flow, excess vegetation on dam faces, dam slopes, and particularly at dam toes, requires trimming to allow performance of the required annual inspections of dam integrity. This vegetation is mowed or trimmed to reduce visual obstruction and to allow the required inspection of these areas. Figure 3 shows the locations of the Site's ponds where such dam maintenance activities occur.

Mowing (or burning) on dams and spillways of the water management ponds has been a routine activity since the 1970s. Because some of these areas are within the habitat of Preble's mouse, and previous consultations that involved other actions in addition to those under discussion here, the USFWS has reviewed these dam maintenance actions prior to their implementation in 2000 and 2001. The USFWS concurred that the mowing during the mouse's inactive period would not cause significant adverse effect to the mouse, after being supplied with further detail on these dam maintenance activities, and inspecting the locations in the field. As a result of this informal consultation DOE and USFWS have identified a best management practice that will be protective of both the dams and the Preble's mouse. The present action is the result of this collaborative

process. This document presents detailed discussions of the vegetation removal and management activities to be performed each year as needed to ensure dam safety.

## 2.2.1 Mowing and Trimming of Vegetation on Dams

Excessive vegetation (e.g., herbaceous vegetation, willows, small trees, and cattails) in the spillways and outlet channels reduces the flow-capacity and has potential to create blockage of the pond outlets and spillways during flood events. Vegetation on the upstream dam faces creates the risk of piping, a hydrologic condition that can cause internal erosion and eventual failure of these earthen structures. Deep root systems of trees and shrubs can displace the protective riprap layer and root tunnels can create flow paths where piping can occur. Additionally, excessive vegetation can provide cover for burrowing mammals, which can also threaten the integrity of the dam because burrows provide pathways for internal erosion during high water conditions.

The schedule for these annual maintenance actions entails performing the mowing, cutting, trimming, and tree removal between November and mid-April. The long-term plan until Site closure is complete, will be to perform the mowing and brush trimming operations during this time period to avoid the active period of the Preble's mouse. Mowing the tops of the dams (crests) during summer will continue to be necessary as long as surveys of the movement monitoring monuments are required to ensure dam integrity. Cutting suckers off all tree stumps will occur as necessary during the growing season to ensure that no large trees can establish in dams and spillways.

### 2.2.1.1 Mowing Vegetation to 3 Inches Tall

Mowing dam crests and spillways will involve mowing dead or dormant herbaceous vegetation in areas illustrated in Figures 4 through 15 during the inactive period of the Preble's mouse. Annual spring greenup will allow vegetation to grow back prior to the species' emergence from hibernation. The total acreage affected by this mowing is 15.31 acres (ac), of which only 3.01 ac is in a Preble's mouse protection area (Table 1.).

**Table 1. Annual Mowing of Herbaceous Vegetation to 3 Inches**

Dam A-1	0.41 ac
Dam A-2 (part in Preble's)	0.92 ac
Dam A-3 (not in Preble's)	0.80 ac
Dam A-4 (not in Preble's)	4.13 ac
Dam B-1	0.41 ac
Dam B-2	0.57 ac
Dam B-3	0.23 ac
Dam B-4	0.03 ac
Dam B-5 (not in Preble's)	1.95 ac
Dam C-1	0.44 ac
Dam C-2 (not in Preble's)	4.59 ac
Landfill Pond (not in Preble's)	0.83 ac
<b>Total</b>	<b>15.31 ac</b>

### 2.2.1.2 Trimming Vegetation to 12 Inches Tall

Areas where woody vegetation is trimmed to 12 inches tall are shown on Figures 4 and 5. An area of approximately 0.05 ac of shrubs and trees will continue to be trimmed annually to a height of approximately 12 inches. Trimming is performed using hand tools. This will allow visual inspection of the dam structures, particularly the dam toes. All trimmed vegetation will be temporarily stored in brushpiles at designated locations next to roads until this material can be removed for disposal.

**Table 2. Trimming Vegetation to 12 Inches Tall**

Dam A-1	0.03 ac
Dam A-2	0.02 ac
<b>Total</b>	<b>0.05 ac</b>

### 2.2.1.3 Cutting Trees to Ground Surface and Removing Trees

Small trees and stump suckers continue to be cut down to the ground surface annually, or as needed during the growing season, to improve spillway flows or to ensure dam integrity. This action is necessary because as trees increase in size they start to damage the dam structure and threaten dam integrity. All trimmed vegetation will be temporarily stored in brushpiles at designated locations next to roads until this material can be removed for disposal. In FY2002 small stumps from previously trimmed trees will be removed from key-points on Dam A-4 and Dam B-5. Neither location is within an established Preble's mouse protection area (Figure 2; DOE 2000), and both are at the approximate high-waterline for the ponds.

### 2.2.1.4 Trimming Dam-Toe Vegetation to 3 Inches Tall

Dam toe and outlet areas where small trees, willows, and herbaceous vegetation will continue to be trimmed annually to approximately three inches in height are shown in Table 3 and on Figures 6, 10, 13, and 14. Approximately 0.082 ac of vegetation will be trimmed to allow visual inspection of dam structures, and to allow proper function of outlets. All trimmed vegetation will be temporarily stored in brushpiles at designated locations next to roads until this material is removed for disposal.

**Table 3. Trimming Vegetation to 3 Inches Tall**

Dam A-3	0.03 ac
Dam B-3	0.02 ac
Dam C-1	0.002 ac
Dam C-2 (not in Preble's)	0.03 ac
<b>Total</b>	<b>0.082 ac</b>

### 2.2.1.5 Trimming Cattails to 3 Inches Tall

Areas where cattails may obstruct water flow at outlet areas will continue to be trimmed annually to a height of three inches. These cattails grow in inundated locations around outlet structures of several ponds. Under current Preble's mouse search guidance, monoculture cattail stands are not considered viable habitat (USFWS 1999).

Approximately 0.05 ac of cattails will be trimmed at four dams, as shown in Table 4 and Figures 7, 11, 12, and 15. None of these areas is within a designated Preble's mouse protection area (Figure 2; DOE 2000). All trimmed vegetation will be temporarily stored in brushpiles at designated locations next to roads until this material can be removed for disposal.

**Table 4. Trimming Cattails to 3 Inches Tall**

Dam A-4 (not in Preble's)	0.02 ac
Dam B-4 (not in Preble's)	0.01 ac
Dam B-5 (not in Preble's)	0.01 ac
Landfill Dam (not in Preble's)	0.01 ac
<b>Total</b>	<b>0.05 ac</b>

### 2.2.1.6 Cutting Vegetation in Riprap to Ground Surface

Areas where vegetation in riprap will continue to be cut to ground surface annually to ensure proper water flow in spillway and outlet areas are shown in Table 5 and Figures 6, 8, and 10. It should be noted that current Preble's mouse survey guidance (USFWS 1999) does not recognize riprap as Preble's mouse habitat, nor does any Site data indicate that Preble's mice use riprap as preferred habitat. The vegetation in these areas is very sparse, and average stem density is approximately 5 plant stems per m<sup>2</sup>. Approximately 0.26 ac of vegetation in riprap will be cut to the ground surface; only half of this is within a Preble's mouse protection area (Figure 2; DOE 2000). All trimmed vegetation will be temporarily stored in brushpiles at designated locations until this material can be removed to appropriate containers for disposal.

**Table 5. Cut Vegetation in Riprap to Ground Surface**

Dam A-3 (not in Preble's)	0.13ac
Dam B-1	0.08 ac
Dam B-2	0.04ac
Dam B-4	0.01 ac
<b>Total</b>	<b>0.26 ac</b>

## 2.2.2 Herbicide Application on Riprap

The dam face areas where vegetation is to be removed by herbicide application are riprap areas on the upstream sides of the dams. These areas are protected from erosion by rock riprap in which undesirable weedy species have become established. The dominant

species is Canada thistle, and other species include ragweed, showy milkweed, diffuse knapweed, and yellow sweet clover. The vegetation in these areas is very sparse, and average stem density is approximately 5 plant stems per m<sup>2</sup>. The roots of this vegetation provide pathways for internal dam erosion, and the vegetation obscures the surface from visual inspection for dam integrity. Complete removal of this vegetation without the use of a total-kill herbicide is not possible. The affected areas are shown in Table 6 and illustrated in Figures 4 through 15.

Riprapped dam faces are, in some cases, included within the buffer portions of Preble's mouse protection areas, but riprap is not classified as preferred habitat under the Site's mapping selection criteria. Interim survey guidelines for Preble's mice exclude riprap from habitat requiring surveys (USFWS 1999), and Site data does not indicate that this is an important habitat element (i.e., no mice have been recorded in riprap). The weedy vegetation growing in the riprap is generally sparse, but the species that have established can cause piping or shifting of the riprap. Removal of these plants is an important part of proper dam maintenance, and contributes to the Site's overall noxious weed control effort.

Approximately 3.92 ac of riprap will be sprayed with Rodeo Aquatic Herbicide™ annually, or as needed, to provide total vegetation control in these areas. Rodeo Aquatic Herbicide™ was selected as the preferred herbicide for this project because of the proximity of the treatment areas to open water. The active ingredient, Glyphosate, may actually be applied to water for aquatic vegetation control, provided all label directions are observed. Although direct application to water is not planned in this maintenance action, this herbicide was identified as one of the most protective to the aquatic environment. To be effective, herbicide must be applied during the active growing season, and therefore within the mouse's active period. Of the entire acreage to be treated with herbicide, only 0.39 ac is within identified Preble's mouse protection areas on the Site. The remaining 3.53 ac is not in identified Preble's mouse habitat or a protection area.

**Table 6. Herbicide Application on Riprap**

Dam A-1	0.07 ac	Dam B-4	0.04 ac
Dam A-2 (not in Preble's)	0.16 ac	Dam B-5 (not in Preble's)	0.55 ac
Dam A-3 (not in Preble's)	0.44 ac	Dam C-1	0.08 ac
Dam A-4 (not in Preble's)	1.03 ac	Dam C-2 (not in Preble's)	1.03 ac
Dam B-1	0.09 ac	Landfill Dam (not in Preble's)	0.32 ac
Dam B-2	0.07 ac		
Dam B-3	0.04 ac	<b>Total</b>	<b>3.92 ac</b>

### 2.2.3 Dam Crest Maintenance and Repair

Over time, dam crests which are driven over, or which otherwise incur surficial damage require repair of surface irregularities to prevent the advance of the damage to the internal structure of the dam. Such maintenance includes filling with soil to smooth the surface, reduce tire rutting, eliminate low spots where water can pool and percolate to the internal

dam structure. In some cases repair of small rills cutting into the up- and downstream dam faces may also be necessary. This action will temporarily disturb some vegetation on the top of the dam, but even within Preble's mouse protection areas, these areas are not generally covered with vegetation representative of identified Preble's mouse habitat at the Site. Several of the dam crests are presently topped with occasional-use roads, which support sparse cover of noxious weeds or other undesirable vegetation. Because of proximity to viable habitat and the possibility that mice may travel in these areas, these are mapped into the protection areas as part of the buffer area component. In the case of the graded road on the A-2 Dam crest, mice are believed to cross this road at times, but it is not included in a Preble's mouse protection area because of its character as a graded gravel road surrounded by grass and riprap.

Dams with graded roads (discussed previously) are routinely maintained by grading and other minor repairs. The crest of Dam C-2 carries a two-track road that is largely vegetated, and which is not graded, but which receives regular traffic that causes depressions and surface wear. The crests of Dams A-1, A-3, B-3, C-1, and B-5 are largely grassed in, but vehicle and foot traffic wears low spots into the crests, causing depressions which collect water that seeps into the dam from the top. This pooled water can soften the dam crest surface, cause additional rutting when driven upon, and seeps into the surface, degrading surficial integrity of the dam. Left long enough without repair and maintenance, this seepage can affect the long-term stability of the dam. Periodic repairs are made on all dam crests, including those with crest roads, as necessary to ensure dam integrity.

### **3. Assessment of Impact**

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#### **3.1 Discussion**

Dam slopes and spillways at the Site have been mowed (or in the past some areas were also burned off) every summer for several decades, and outlet structures have been cleared of obstructing vegetation periodically during the life of the dams. Outlet structures including outlet boxes, culvert mouths, and the first few yards of the downstream channels below outlets have been routinely cleared of vegetation. Riprap has been maintained free of weeds and other undesirable vegetation through the use of mowing (weed-whacking) and periodic herbicide application. Access pathways are routinely cut through overgrown brush around water sampling stations and valve accesses for safety reasons. These areas are in and adjacent to Preble's mouse habitat.

In order to minimize the potential of impact to Preble's mouse habitat during their active period, and thereby the potential to affect the mouse population, the Site revised the mowing and brush-trimming practices and now does the majority of vegetation clearing during the mouse's hibernation period. Annual inspections can be completed before the vegetation breaks dormancy. Allowing vegetative cover to recover during the normal

spring greenup provides better herbaceous cover for the start of mouse's active period, and the cessation of summer mowing now allows cover to remain intact throughout the growing season.

The project descriptions and figures presented in the previous sections describe the areas that are affected by this programmatic action. While these activities will not affect surface water volumes, and therefore do not affect lower Platte River species that depend on instream flows, some of these activities do take place in Preble's mouse habitat. It is the Preble's mouse, therefore, for which potential impacts are discussed.

Because mowing and brush cutting is done while plants are dormant, or just starting the year's growth, the herbaceous canopy cover normally recovers before the Preble's mice emerge from hibernation about mid-May. The shrubby areas that are trimmed to 12 inches in height are within comparatively larger stands of coyote willow, so the limited area of trimming leaves only small gaps in this cover. Allowing the vegetation to remain uncut during the summer has increased available cover in areas where it has been nonexistent during a large portion of the mouse's active period for as much as 30 years, mitigating the creation of small open areas within the canopy.

The change in timing of mowing and brush cutting from the mouse's active season to the mouse's inactive season now allows more viable cover to remain in areas that had previously been mowed in summer. The limited number of small trees that are periodically removed provided only very isolated canopy cover in areas that have been maintained in an otherwise mowed condition during the mouse's active periods. The greater availability of herbaceous cover has added contiguity across some dams where vegetation had been maintained in a condition that was too short to provide security cover for the Preble's mouse at those locations in the recent past. Because mowing will not occur during the mouse's active period, and also because dam maintenance actions protect downstream Preble's mouse habitat, this action is judged unlikely to adversely affect the mouse.

Road maintenance affects small portions of the total Preble's mouse protection area on the Site. This maintenance has been ongoing for decades, and data indicate there is no significant impact of the Preble's mice in these areas. Continuation of this activity is judged not likely to adversely affect the mouse.

Herbicide application is planned for the upstream faces of dams where undesirable vegetation has invaded the riprap surface. The majority of the areas slated for treatment are not within Preble's mouse protection areas. Riprap has not been shown to be preferred habitat of Preble's mice, and the vegetation is in most cases too sparse to offer viable security cover in these areas. Because the herbicide cannot be metabolized by mammals, the herbicide itself will not affect the mouse, and removal of sparse vegetation in areas that are unlikely to be used by the mouse is not likely to adversely affect the mouse.

Small-scale dam crest repair will be limited to high traffic areas, roads, and areas that are not included within Preble's mouse protection areas. These actions are unlikely to adversely affect the mouse.

### **3.2 Conclusions**

The finding of this evaluation is that while the road maintenance and dam mowing and vegetation clearing that must be done for dam safety purposes may affect the Preble's mouse habitat at the Site, it does not adversely affect the mouse. Rather, the revised schedule and strategy provide improved conditions for the Preble's mouse during its active period. Further, the ability of the Site to ensure dam stability protects existing downstream Preble's mouse habitat.

## **4. Summary**

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The listed species considered for this evaluation included the Preble's meadow jumping mouse, the bald eagle, the Ute ladies'-tresses orchid, the Colorado butterfly plant, the piping plover, the least tern, the whooping crane, the pallid sturgeon, the Eskimo curlew, the American burying beetle, and the western prairie fringed orchid.

Only the Preble's mouse is a full-time resident at the Site. The bald eagle visits the Site on a casual basis, using parts of the Site's Buffer Zone as occasional foraging territory during seasonal occupation in the vicinity. Although potential habitat for Ute ladies'-tresses and Colorado butterfly plant does exist at the Site, neither of these plant species has been recorded at the Site, despite several thorough searches. Neither of these plants has been recorded in areas immediately downstream of the Site. Because the bald eagle and the two plants have limited or unrecorded presence at the Site, the actions discussed herein have been determined to have no effect on these species. The remaining five species which occur in the lower Platte River drainage of Nebraska are not likely to be affected because no water impacts are anticipated by these routine actions.

The routine road maintenance, minor dam repair, and vegetation control actions will continue until Site closure. Routine maintenance of Buffer Zone roads takes place in and adjacent to Preble's mouse habitat. This road and dam maintenance has been conducted routinely for from 25 to nearly 50 years, depending on location. The Preble's mouse populations in these areas appear to have adapted to these routine activities. Although there may be some effect on Preble's mouse habitat from these activities, the areas affected are small, and many generations of the mouse have existed during the time these activities have been performed. While these isolated activities may affect the mouse, such effects are not likely to adversely affect the mouse.

The following definitions, cited from the USDA Forest Service Manual (USFS 1995), were used in categorizing the effects from actions discussed in Part I of the PBA on the selected threatened or endangered species:

- “No effect” — Proposed action does not have any impact on a listed or proposed species or any designated or proposed critical habitat.
- “May affect” — Proposed action has either a positive or negative effect on a listed or proposed species or any designated or proposed critical habitat.
- “Likely to adversely affect” — Proposed action “may affect” and is “likely to adversely affect” a listed or proposed species or any designated or proposed critical habitat.
- “Not likely to adversely affect” — Proposed action “may affect” and is “not likely to adversely affect” a listed or proposed species or any designated or proposed critical habitat. This conclusion applies to situations where there may be an effect, but those effects are clearly beneficial, discountable, or insignificant. Beneficial effects are those that have contemporaneous positive impacts. Discountable effects are those that are extremely unlikely to occur. Insignificant effects are those of such small magnitude that they will not increase the probability of mortality or habitat destruction.

Table 7 summarizes the findings of this assessment for each species evaluated.

**Table 7. Findings of Biological Assessment**

Species	No Effect	May Affect	Not Adverse	Adverse Effect
Bald Eagle	X			
Least Tern (Interior Population)	X			
Piping Plover	X			
Whooping Crane & Critical Habitat	X			
Pallid Sturgeon	X			
Eskimo Curlew	X			
Western Prairie Fringed Orchid	X			
American Burying Beetle	X			
Ute Ladies'-Tresses Orchid	X			
Colorado Butterfly Plant	X			
Preble's Meadow Jumping Mouse		X	X	

## **5. References**

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DOE & USFWS. 1999. Interagency Agreement Number DE-AI34—99 RF 01776 between the U.S. Fish and Wildlife Service and the U.S. Department of Energy Rocky Flats Field Office for the Rock Creek Fish and Wildlife Cooperative Management Area at the Rocky Flats Environmental Technology Site. Signed May 17, 1999.

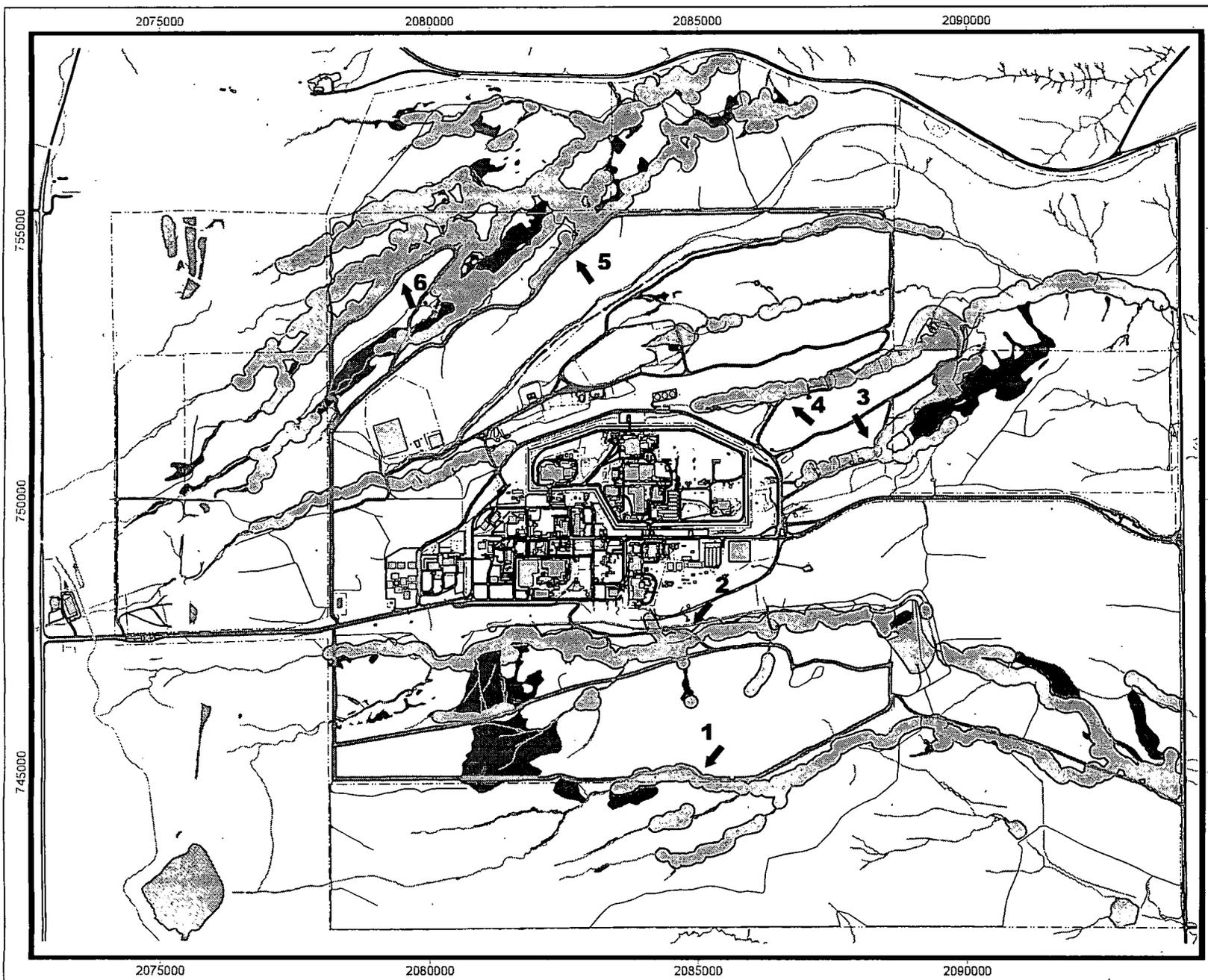
ESCO. 1994. Report of findings, Ute Ladies'-Tresses and Colorado Butterfly Weed surveys. Rocky Flats Buffer Zone. ESCO Associates, Inc., Boulder, CO. September 13, 1994.

ESCO. 1993. Report of findings, Ute Ladies'-Tresses and Colorado Butterfly Weed surveys. Rocky Flats Buffer Zone. ESCO Associates, Inc., Boulder, CO. September 24, 1993.

FR. 1999a. Final Rule to Remove the American peregrine falcon from the federal list of endangered and threatened wildlife, and to remove the similarity of appearance provision for free-flying peregrines in the coterminous United States. Federal Register: August 25, 1999 (Volume 64, Number 164, Page 46541-46558). U. S. Fish and Wildlife Service.

FR. 1999b. Proposed Rule to Remove the bald eagle in the lower 48 states from the federal list of endangered and threatened wildlife. Federal Register: July 6, 1999 (Volume 64, Number 128, Page 36453-36464). U. S. Fish and Wildlife Service.

USFWS. 1999. Interim Survey Guidelines for Preble's Meadow Jumping Mouse. Revised May 19, 1999.



Routine maintenance activities  
in the Buffer Zone from  
present until closure.

Figure 1.

LEGEND

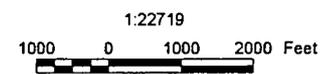
- Road grading & repair
- Roadside mowing
- Dam slope & spillway mowing
- Preble's mouse protection areas
- Contiguous wetlands

Standard Features

- Buildings
- Lakes & ponds
- Streams & ditches
- Fences
- Paved roads
- Dirt roads

DATA SOURCE FOR STANDARD FEATURES:  
Buildings, fences, hydrography, roads and other  
structures from 1994 aerial fly-over data  
captured by ES&G REI, Las Vegas.  
Digitized from the orthophotographs, 1/95.

Data Source -  
Protection Areas, Contiguous Wetlands,  
and road and dam maintenance areas  
provided by Exponent, 2001.  
POC Karan North, KH x9876.



State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD27

U.S. Department of Energy  
Rocky Flats Environmental Technology Site

Prepared by: **Exponent** For: **Kaiser-Hill Company, LLC**

**BIOLOGICAL ASSESSMENT**  
**FOR**  
**IMPLEMENTATION OF THE ROCK CREEK RESERVE**  
**INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN**  
**AND ENVIRONMENTAL ASSESSMENT**

**ASSESSING POTENTIAL IMPACTS TO**  
**PREBLE'S MEADOW JUMPING MOUSE**  
*(Zapus hudsonius preblei)*

**AT**  
**ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE**  
**GOLDEN, COLORADO**

## **Scope**

This Biological Assessment (BA) was prepared to comply with the Endangered Species Act (ESA) section 7(a)(2) and to fulfill the requirements of the National Environmental Policy Act (NEPA). A draft Integrated Natural Resources Management Plan and Environmental Assessment for Rock Creek Reserve (Plan) was prepared and submitted for public and agency review and comment in March 2001. The U.S. Fish and Wildlife Service (Service), Office of Ecological Services, requested a BA to identify potential impacts to the Preble's meadow jumping mouse (Preble's), a federally-listed threatened species that resides in the Rock Creek Reserve. 50 CFR Section 402.02 requires BAs to be prepared for "major construction activities", or activities with similar impacts. Federal agencies must document the evaluation of the effects of their actions to threatened or endangered species or their designated critical habitat. Informal consultation with the Service determined a BA to be the best method to begin formal consultation and identify potential impacts from proposed actions within the Plan. This BA discusses only those actions considered within the Plan that "may affect" Preble's or its habitat. This BA discusses only those potential impacts that would occur from management activities in the Rock Creek Reserve. Activities in other areas of the Rocky Flats Environmental Technology Site with potential to impact Preble's are being considered in a separate process.

## **Background**

Rock Creek Reserve (Fig. 1) was established in May of 1999 in recognition of the area's biological significance. Although still under ownership of the Department of Energy (DOE), Rock Creek Reserve is co-managed with the Service as part of a cooperative agreement signed by the two agencies in 1999. The need for an integrated natural resources management plan was recognized and included as a requirement in the cooperative agreement. The Plan discusses management tools and options specifically for Rock Creek Reserve for the next five years.

The Plan was developed as a tool to cooperatively manage natural and cultural resources under the current federal ownership and land use conditions. Any significant changes to the current conditions will be addressed as a supplement to the Plan or in a separate document if necessary. All management strategies in the Plan will be consistent with Rocky Flats' current mission of facilities demolition and site remediation resulting in closure.

The Plan utilizes basic criteria for protecting and enhancing natural resources using watershed, landscape, and ecosystem perspectives, consistent with the current Rocky Flats mission and Service goals. Provisions of the Plan apply to all management entities at Rocky Flats. For the purposes of this document those entities are currently the DOE (including its contractors) and the Service. The Plan provides the management goals and guidance for Rock Creek Reserve for future specific natural resource management plans, such as noxious weed management plans, cultural resource management plans, etc.

Threats that warranted listing of Preble's by the Service under the ESA should be reduced and native species health and abundance improved through implementation of the Plan.

Upon public and agency review of the Plan and approval, the DOE agrees to implement the Plan and the "2001 Preble's Meadow Jumping Mouse Management Policy for the Rocky Flats Environmental Technology Site".

New construction that would potentially impact federally-listed species or their habitat, emergency actions and other activities not covered in this BA will require additional consultation under section 7 of the ESA.

## **I. BASELINE**

Under the interagency agreement, Rock Creek Reserve was originally comprised of 800 acres in the north Buffer Zone area of the Rocky Flats Environmental Technology Site. Under the approved expansion proposal within the Plan, Rock Creek Reserve now comprises approximately 1700 acres. Of the 1700 acres, 150 to 200 acres contain Preble's habitat. Rock Creek Reserve is considered to be relatively uncontaminated with hazardous waste and radionuclides, showing background levels in previous samples (refer to the Plan for more details).

## **II. SPECIES INVOLVED**

The primary focus of this BA is the potential for adverse impacts to Preble's and/or the habitat upon which the species depends within the Rock Creek Reserve. The potential impacts described in this BA could also impact other native species resident or transitory on Rock Creek Reserve. These species/communities include, but are not limited to, unique plant communities, native fish populations, and migratory birds. The Bald Eagle does not nest in Rock Creek Reserve, and the main prey in the area, prairie dogs, does not occur in Rock Creek Reserve. A pair of Bald Eagles nests near Standley Lake, a reservoir located approximately five miles from Rock Creek Reserve. None of the management proposals within the Plan are expected to affect Bald Eagles.

Using an ecosystem approach, implementation of the Plan should improve the status of Preble's and other native species existing within Rock Creek Reserve through actions designed to protect and enhance native plant communities and other resources. However, de-listing of federally-listed species will depend upon the removal of range-wide threats to the species and completion of the goals and objectives of a Service-approved Recovery Plan.

## **III. RESPONSIBLE PARTIES**

Department of Energy Rocky Flats Field Office  
10808 Highway 93 Unit A  
Golden, CO 80403

United States Department of Interior  
Colorado Fish and Wildlife Management Assistance Office  
755 Parfet Suite 496  
Lakewood CO 80215

#### **IV. PROBLEMS FACING PREBLE'S**

The success of any conservation or recovery program depends on eliminating or reducing the impact of activities that threaten the species' existence. The following list is a compilation of threats based on the five criteria considered for federal listing of a species in Section 4(a)(1) of the ESA:

- a. The present or threatened destruction, modification or curtailment of its habitat or range.
- b. Overutilization for commercial, recreational, scientific or educational purposes.
- c. Disease, predation, competition or hybridization.
- d. The inadequacy of existing regulatory mechanisms.
- e. Other natural (e.g., drought) or human induced (e.g., socio-political) factors affecting its continued existence.

The Plan identifies the main threat to Preble's, its habitat and other sensitive species/plant communities within the Rock Creek Reserve as modification of habitat through the presence of several species of particularly aggressive, invasive weeds, and outlines activities to remove or reduce this threat. These actions, although considered to be overall beneficial, have the potential to adversely affect Preble's individuals.

#### **V. PROPOSED ACTIONS WITH POTENTIAL TO AFFECT PREBLE'S**

Although beneficial in the long-term, the following natural resource management actions proposed within the Plan are considered to have the potential for short-term adverse impacts to Preble's or its habitat. Please refer to the Rock Creek Reserve Integrated Natural Resources Management Plan and Environmental Assessment for additional detail.

A. Noxious Weed Control Measures. Approximately 850 acres of Rock Creek Reserve are infested with several species of noxious (invasive) weeds. Of that acreage, approximately 10 to 15 acres falls within Preble's habitat. The Plant Protection Act and the Colorado Weed Management Act require that measures be undertaken to control, and prevent the spread, of listed noxious weeds. The following measures are proposed to control noxious weeds in the Rock Creek Reserve. They are listed in the order of severity of potential impacts to Preble's and other sensitive plant and animal species.

##### **1. Herbicide applications.**

1.1. Adverse impacts could result from direct exposure to the chemical at the time of application. Exposure from immediate ingestion of vegetation with the chemical residue on it or within it from a systemic herbicide could also occur. This type of exposure could result in a teratogenic or carcinogenic effect on the animal species exposed. Timing of applications is

crucial to minimize these impacts while still gaining the benefit of controlling the weeds. No more than 2% (3 acres) of Preble's habitat in Rock Creek Reserve will be treated with herbicides in any year, for a maximum total of 10% (15 acres) over the life of the Plan (5 years).

Applications of herbicides will not be made in Preble's habitat while Preble's are active, or while migratory, ground-nesting birds are breeding in areas that could be impacted. Herbicides would not be used near open water and would be used in wetland areas only through the use of backpack sprayers to ensure precise application to monocultures of the target weed (most likely Canada thistle). Applications would comply with label restrictions and would be done in very limited areas. Biological control would be the main strategy in riparian areas and wetlands.

1.2. Indirect impacts to Preble's and other sensitive species could result from adverse impacts to non-target plants which comprise the ecosystem. Diffuse knapweed and Dalmatian toadflax in the more upland habitat, and Canada thistle in the riparian area and wetlands are the main threats. These weeds displace the native vegetation that Preble's depends upon for survival. The Plan includes monitoring and re-vegetating with native species as the target weed populations decline. Removal of one weed species can set the stage for another aggressive weed to gain a foothold. Minimization of impacts to non-target species is important to the overall goal of the Plan. There will be, however, short-term, adverse impacts to non-target species from herbicide applications. Invasive weed control strategy as outlined in the Plan uses other, more long-term methods to control weeds, with herbicides used only in support of the other forms of control.

2. Prescribed burning. Prescribed burning has the beneficial impacts of returning nutrients to the soil for use by native plant species, and reducing fuel (thatch) in Preble's habitat. This will minimize the risk of wildfires, and fires made hotter by increased fuel loads, which could have an even greater impact on Preble's and its habitat. Prescribed burning would be done in conjunction with herbicide usage as described above to provide optimum benefit for weed control when applicable. This method would be used when a monoculture of the weed is present. Prescribed burning would be implemented in the fall, with herbicide applications following in the early spring to kill the increased number of weeds that germinate from the soil seed bank after burning. Heat from the fire may cause more weed seeds to germinate, along with the removal of the thatch's shading effect. Herbicides can then be used more effectively. This method may or may not be applicable in some areas of Preble's habitat.

2.1. Direct impacts from burning that could adversely affect Preble's and other sensitive species include killing or harming individuals active above ground during a burn. A small window of opportunity for burning is available due to restrictions on burning at certain times of the year by the State of Colorado. Burning in Rock Creek Reserve would be prescribed during the early spring (March for xeric tallgrass prairie) or late fall (October for wetland areas) to avoid the presence of Preble's, nesting ground birds and most reptiles. If used, prescribed burning will be implemented in no more than 2% (1 to 4 acres) of Preble's habitat in any one year, for a maximum of no more than 10% (5 to 20 acres) of Preble's habitat being burned over the life of the Plan. Prescribed burning is a controversial issue at Rocky Flats because of public concerns, and burning may not be implemented at all, or at the lesser (1 acre) range of implementation. If approved for implementation, areas not within Preble's habitat will be burned in accordance with the Prescribed Burn Annual Rotation Plan for Rocky Flats. These areas will then afford firebreak protection for subsequent burns. It is DOE policy that each prescribed burn

implemented at Rocky Flats will be coordinated and documented in a specific burn prescription plan. Any burn planned to take place in Rock Creek Reserve in all, or part, of Preble's habitat will also include a Preble's habitat protection and mitigation section in the case that a prescribed burn were to become uncontrollable due to unexpected high winds, etc. This habitat protection and mitigation section could include measures such as the use of natural firebreaks (roads, creek, etc.), immediate re-vegetation efforts or re-location of individuals to other areas of suitable habitat in an emergency situation. Specific burn prescription plans that include Preble's habitat will be submitted to Ecological Services for consultation and approval.

2.2. Indirect adverse impacts to Preble's and other sensitive species could occur from damage to the native plant communities through too frequent use of burns. Frequent burning can damage the root systems of the native grasses allowing annual, weedy species to dominate. This is apparent in areas that are burned every year, for example, ranges on military lands that often catch fire as a result of military training. Damage to the native grasses and other vegetation in general also results in erosion from areas of bare ground. Loss of topsoil and sedimentation from run-off could result in increased stream turbidity and off-site transport, especially during heavy rain events. Burning wetland areas in the fall decreases the chances of this happening until ground cover has re-established somewhat. Due to the availability of water, wetland vegetation has the ability to recover at a faster rate than vegetation in the xeric, upland areas. A given area of ground would only be subjected to prescribed burning one time during the five-year period of the Plan, with burning planned for late October/early November, or in April.

Not utilizing prescribed burning may also be considered a potential adverse impact. Years of fire suppression have caused a high level of thatch buildup, increasing the fuel load greatly above what would naturally occur. This increases the potential for an uncontrollable wildfire in Preble's habitat, and for the increased fuel load to cause fires to burn hotter, causing more damage to plant roots and trapped wildlife.

3. Biological Control. Biological controls (insects) have been released at Rocky Flats for several species of noxious weeds. The Plan proposes to increase the use of biological control for diffuse knapweed, dalmatian toadflax and Canada thistle.

3.1. Direct impacts to Preble's and its habitat would be insignificant. The insects would not cause impacts, and the presence of workers releasing insects and recording field data would be minimal. No insect species will be released if they have been proven to attack native plants elsewhere. A literature search has revealed very little research implicating problems with non-target hosts, implying that this has not been a significant problem with biological control of weeds under current environmental laws, such as the ESA and NEPA.

3.2. Indirect impacts would be beneficial overall through the restoration of habitat to native plant species. As with any weed control method, an adverse indirect impact could result through the succession of different weed species as the target weed populations decline, especially if the secondary weed is of no use as food or cover for Preble's. Monitoring of the weedy areas will determine if reseeding/revegetation is required.

B. Structural stabilization of the Lindsay Ranch. The barn is located approximately 200 feet from the streambed and Lindsay pond, and the ranch house is approximately 300 feet from the stream and pond.

1. Direct impacts. Any construction activity in the vicinity of the house or barn has the potential to harm or harass wildlife, including individual Preble's. The barn and house are used extensively by wildlife. America kestrels nest in the house, great horned owls nest in the barn. Deer use the barn for shelter, and a porcupine has been reported to use the house for shelter. Any stabilization activity would be accomplished in the late fall or winter to avoid the harm or harassment of nesting raptors and other migratory birds, including waterfowl on Lindsay pond. Preble's would be hibernating, and care would be taken to keep all vehicles and equipment on the road to avoid damage to vegetation and soils.

2. Indirect impacts to wildlife could result if the stabilization measures rendered the buildings unusable for wildlife (especially raptors) by closing off entrances/exits to the buildings, or removing nesting substrates. This could actually benefit individual Preble's by removing the presence of those predators from the immediate area.

C. Use of rotenone to remove bass from Lindsay pond. The use of rotenone in Lindsay pond would have severe short-term impacts on the aquatic life in the pond, especially fish, amphibians and invertebrates. These impacts are very short-lived, and the return of native fish, amphibians and invertebrates to ponds treated in this manner is generally quite successful.

1. Direct adverse impacts to Preble's and other non-target wildlife would be insignificant due to the timing of the rotenone application. This would be scheduled for October when impacts to wildlife would be minimal, and Preble's would be hibernating. Barriers such as sandbags would be used to prevent leakage of rotenone and potassium permanganate (neutralizer) into the downstream area.

2. Indirect impacts would be overall beneficial. Bass, a non-native species, have great impact, especially in small isolated systems where they remove all native fish and most amphibians, through predation. They are currently the only fish species present in Lindsay pond. Bass prey on small mammals and birds also, and could prey on swimming Preble's. The removal of this fish species will have a positive effect in general through the re-establishment of a more diverse population of aquatic species in Lindsay pond, and would remove the possibility of bass preying upon Preble's in Lindsay pond.

## VI. CUMULATIVE IMPACTS

The potential exists for cumulative adverse short-term impacts from the combination of prescribed burning and spraying herbicides in Preble's habitat. This would be minimized through mitigation. Mitigation would include timing burns and herbicide applications to take place during Preble's hibernation, spot spraying of small areas of weeds to minimize impacts to non-target vegetation, burning combined with spraying only when a monoculture of the weed is present, and monitoring impacts. If adverse impacts such as succession of non-desirable vegetation or lack of re-vegetation are observed after the first year (or at any time), those control

methods will cease while the techniques are re-evaluated. Controlling noxious weeds and restoring native vegetation would have long-term cumulative benefits to Preble's and its habitat.

## **VII. CONCLUSIONS**

Implementation of the proposed actions discussed above is subject to the availability of funds. These actions were identified as having the potential to adversely affect individual Preble's through short-term, direct and indirect impacts. Mitigation as part of the proposed actions ensures the adverse impacts would be minimal or non-existent and would impact only individuals; the continued existence of the species would not be jeopardized. The overall long-term impacts are expected to be beneficial not only to Preble's, but to the wildlife in general found in the Rock Creek Reserve.



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Ecological Services  
755 Parfet Street, Suite 361  
Lakewood, Colorado 80215

IN REPLY REFER TO:

ES/GJ-6-CO-01-F-021  
Mail Stop 65412 LKWD

MAY 21 2001

Joseph A. Legare  
Assistant Manager for Environment and Infrastructure  
Department of Energy  
Rocky Flats Field Office  
10808 Highway 93, Unit A  
Golden, Colorado 80403-8200

Dear Mr. Legare:

In accordance with section 7 of the Endangered Species Act as amended (16 U.S.C. 1531 et seq.) (Act) and the Interagency Cooperative Regulations (50 CFR 402), this transmits the U.S. Fish and Wildlife Service's final biological opinion on the effects of proposed actions on federally-listed endangered and threatened species as described in the Biological Assessment for the Implementation of the Rock Creek Reserve Integrated Natural Resources Management Plan and Environmental Assessment (BA). The BA assesses potential impacts to federally-listed species which may occur through the implementation of the Rock Creek Reserve Integrated Natural Resources Management Plan and Environmental Assessment (Plan).

Your request for formal consultation was agreed to at a meeting which occurred in early May, 2001, at the offices of the Service and was based upon review of the Plan. At issue are the effects of the proposed actions on the threatened Preble's meadow jumping mouse (*Zapus hudsonius preblei*). No other federally-listed species will be affected by the proposed activities. If the various project descriptions change, or previously unknown listed species are found to be present and adversely affected, the effect determinations would change and require reinitiation of formal consultation.

Your cover letter for the BA, dated May 16, 2001, states that the activities described in the Plan and BA will have "no affect, or may affect, but is not likely to adversely affect" any federally-listed species within the Rock Creek Reserve. The Service disagrees with this conclusion and believes that the two activity types described in the Plan may adversely affect the Preble's meadow jumping mouse. Therefore, we have provided the following biological opinion and accompanying Incidental Take Statement.

This biological opinion is based on information provided in the BA, the Plan, and informal consultation between our staffs. The above-mentioned documents are incorporated herein by reference. A complete administrative record of this consultation is on file at the Service's Field Office.

### Consultation History

On May 13, 1998, Preble's was listed as threatened under the Act. Full protection for Preble's became effective on June 12, 1998.

Rock Creek Reserve was established in May of 1999 in recognition of the area's biological significance. Although still under ownership of the Department of Energy (DOE), Rock Creek Reserve is co-managed with the Service as part of a cooperative agreement signed by the two agencies in 1999. The need for an integrated natural resources management plan was recognized

and included as a requirement in the cooperative agreement. The Plan discusses management tools and options specifically for Rock Creek Reserve for the next five years.

The Plan was developed as a tool to cooperatively manage natural and cultural resources under the current federal ownership and land use conditions. The Plan utilizes basic criteria for protecting and enhancing natural resources using watershed, landscape, and ecosystem perspectives, consistent with the current Rocky Flats Environmental Technology Site (RFETS) mission of facilities demolition and site remediation resulting in closure, as well as reflecting Service goals. The Plan provides the management goals and guidance for Rock Creek Reserve for future specific natural resource management plans, such as noxious weed management plans, cultural resource management plans, etc.

The consultation process allows DOE and the Service to examine regional trends and issues. Programmatic consultations on limited time frames facilitate the identification of problems and issues before they become severe and while proactive remedies still exist. Such early and continual cooperative efforts between action agencies and regulatory agencies represent a critical component in the adaptive management process.

## BIOLOGICAL OPINION

### DESCRIPTION OF THE PROPOSED ACTION

The action area is located on the RFETS in northern Jefferson County, Colorado. The proposed action is the implementation of the Plan. The BA discussed only those actions considered within the Plan that "may affect" Preble's or its habitat and only those potential impacts that would occur from management activities in the Rock Creek Reserve. Activities in other areas of the RFETS with potential to impact Preble's will be considered in a separate process. Any significant changes to the current conditions will be addressed as a supplement to the Plan or in a separate document if necessary. Using an ecosystem approach, implementation of the Plan should improve the status of Preble's and other native species existing within Rock Creek Reserve through actions designed to protect and enhance native plant communities and other resources.

The Plan identifies the main threat to Preble's, its habitat and other sensitive species/plant communities within the Rock Creek Reserve as modification of habitat through the presence of several species of particularly aggressive, invasive weeds, and outlines activities to remove or reduce this threat. Although beneficial in the long-term, some natural resource management actions proposed within the Plan may have the potential for short-term adverse impacts to Preble's or its habitat.

In reviewing the Plan, the Service has determined that the following activities may result in adverse effects to Preble's. Therefore, these proposed activities are evaluated in this biological opinion and the effects of incidental take are analyzed. Specifically, these actions are described below.

1. Noxious Weed Control Measures - Herbicide Application. Approximately 850 acres of Rock Creek Reserve are infested with several species of noxious (invasive) weeds. Of that acreage, approximately 10 to 15 acres falls within Preble's habitat. No more than 2% (3 acres) of Preble's habitat in Rock Creek Reserve (assuming a minimum of 150 acres of suitable, occupied habitat) will be treated with herbicides in any year, for a maximum total of 10% (15 acres) over the life of the Plan (5 years).
2. Prescribed Burning. A maximum of 2% (3 acres) of Preble's habitat in any one year, for a maximum of no more than 10% (15 acres) of Preble's habitat would be burned over the life of the Plan. Direct impacts from burning that could adversely affect Preble's and other sensitive species include killing or harming individuals active above ground during a burn. Prescribed burning would be done in conjunction with herbicide usage to provide optimum benefit for weed control when applicable.

### Conservation Measures

Actions in the project description that will be implemented to further the recovery of threatened and endangered species are known as conservation measures. As part of the proposed action, the beneficial effects of these conservation measures are taken into consideration in the jeopardy and incidental take analyses. Conservation measures are part of the proposed action and their implementation is required under the terms of this consultation. Specific conservation measures identified in the BA and the Plan and included in this biological opinion that will benefit threatened and endangered species include the following.

#### Herbicide Applications

1. Applications of herbicides will not be made in Preble's habitat while Preble's are active.
2. Herbicides would not be used near open water and would be used in wetland areas only through the use of back-pack sprayers to ensure precise application to monocultures of the target weed (most likely Canada thistle).
3. Applications would comply with label restrictions and would be done in very limited areas.

#### Prescribed Burning

4. Burning in Rock Creek Reserve would be prescribed during the early spring (March for xeric tallgrass prairie) or late fall (October for wetland areas) to avoid the presence of Preble's.
5. Any burn planned to take place in Rock Creek Reserve in all, or part, of Preble's habitat will also include a Preble's habitat protection and mitigation section in the case that a prescribed burn were to become uncontrollable due to unexpected high winds, etc. This habitat protection and mitigation section could include measures such as the use of natural firebreaks (roads, creek, etc.), immediate re-vegetation efforts or re-location of individuals to other areas of suitable habitat in an emergency situation. Specific burn prescription plans that include Preble's habitat will be submitted to Ecological Services for consultation and approval.

### STATUS OF THE PREBLE'S MEADOW JUMPING MOUSE

Preble's is a small rodent in the family Zapodidae and is 1 of 12 recognized subspecies of the species *Z. hudsonius*, the meadow jumping mouse. Preble's is native only to the Rocky Mountains-Great Plains interface of eastern Colorado and southeastern Wyoming. This shy, largely nocturnal mouse lives in moist lowlands with dense vegetation. It is 8 to 9 inches long (its tail accounts for 60 percent of its length) with hind feet adapted for jumping. Preble's hibernates underground from September to May.

Historic 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, Goshen, and Converse counties in Wyoming (Kruttsch 1954, Compton and Hugie 1993). Armstrong et al. (1997, p. 77) 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 has undergone a decline from its historic range and populations within its remaining range have been lost. Habitat loss and fragmentation resulting from human land uses have adversely impacted Preble's populations. David Armstrong (University of Colorado, pers. com. 1998) concluded that the meadow jumping mouse, in this region as elsewhere, is a habitat specialist, and that its specialized habitat is declining.

Compton and Hugie (1993, 1994) 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 the Preble's can no longer persist. Corn et al. (1995) proposed that a 100 meter (328 foot) area of unaltered habitat be established to protect the flood plain of Monument Creek from a range of human activities that might adversely affect Preble's or its habitat. Roads, trails, or other linear development 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.

Further information about the biology and status of the Preble's can be found in the "Conservation Assessment and Preliminary Conservation Strategy for Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*)" (Shenk, 1998, available upon request).

#### **ENVIRONMENTAL BASELINE**

Under the interagency agreement, Rock Creek Reserve was originally comprised of 800 acres in the north Buffer Zone area of the RFETS. Under the approved expansion proposal within the Plan, Rock Creek Reserve now comprises approximately 1700 acres. Of the 1700 acres, 150 to 200 acres contain Preble's habitat.

#### **EFFECTS OF ACTION**

The proposed actions will affect a maximum of 30 acres of potential Preble's habitat over the life of the Plan. Specifically, this includes a maximum of 3 acres annually for noxious weed control within Preble's habitat and 3 acres annually for prescribed within the 5-year period (a maximum total of 6 acres annually).

The riparian corridors located within Rock Creek Reserve are expected to be inhabited by Preble's year-round. Therefore, there is a possibility that the proposed actions could directly impact Preble's through direct killing and alteration of habitat likely to be used by Preble's. The areas to be impacted represent a small portion of the potential Preble's habitat present within Rock Creek Reserve. The projects are not expected to significantly impact the ability of Preble's to travel upstream or downstream along suitable riparian areas.

#### **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 actions are not considered in this section because they require separate consultation pursuant to section 7 of the Act. The project area is located on the RFETS in northern Jefferson County, Colorado. Any additional adverse effects not included in this biological opinion will require reinitiation of this opinion or separate section 7 consultations. Current land use outside of RFETS is becoming focused upon residential and commercial development, rather than historic agricultural uses, and is expected to continue at a substantial rate. Therefore, the Service expects a variety of additional direct and secondary adverse impacts to continue to occur due to future development outside of these lands which could affect the viability of Preble's populations on the RFETS.

## CONCLUSION

This biological opinion is based on information regarding cumulative effects, conditions forming the environmental baseline, the status of the Preble's, and the importance of the project area to the survival and recovery of the species. The data used in this biological opinion constitute the best scientific and commercial information currently available.

It is the Service's biological opinion that neither the direct nor indirect effects of the proposed projects (which includes the implementation of conservation measures agreed to during informal consultation and outlined in this biological opinion) will jeopardize the continued existence of Preble's. Although the proposed projects may adversely affect Preble's and its habitat within Rock Creek Reserve, the proposed actions and conservation measures will avoid the likelihood of jeopardy to the species. No critical habitat has been designated for this species, therefore, none will be affected.

## INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act 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 DOE, as appropriate, for the exemption in section 7(o)(2) to apply. DOE has the continuing duty to regulate the activities covered by this Incidental Take Statement. If DOE fails (1) to assume and implement the terms and conditions or (2) to require any hired personnel or contractors to adhere to the terms and conditions of the Incidental Take Statement through enforceable terms that are added to any permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, DOE must report the progress of the proposed actions or their impacts on the species to the Service as specified in the Incidental Take Statement.

## AMOUNT OR EXTENT OF TAKE

The Service anticipates that it will be difficult to quantify or detect incidental take of Preble's due to direct mortality because of their small size and secretive nature. However, the following level of take can be anticipated by loss of food, cover, and other essential habitat elements. The Service anticipates that the proposed actions will result in incidental take of an undetermined number of Preble's associated with a maximum of 30 acres of potential Preble's habitat over 5 years. Specifically, this includes a maximum of 6 acres annually, to be comprised of 3 acres annually due to noxious weed control activities/herbicides and 3 acres annually for prescribed burning (the majority of which would be in upland forage areas).

## REASONABLE AND PRUDENT MEASURES

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of Preble's.

1. DOE will monitor the extent of habitat impacted to ensure that it does not exceed the authorized area.
2. Any accidental impacts to areas outside of the authorized area will be restored and mitigated in coordination with the Service.
3. DOE will monitor all aspects of any proposed restoration, enhancement, and mitigation actions to ensure project completion and success.

#### **TERMS AND CONDITIONS**

In order to be exempt from the prohibitions of section 9 of the Act, DOE must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring. These terms and conditions are non-discretionary.

1. Workers onsite will be trained by a qualified biologist as to the reason for, and importance of, limiting impacts to vegetated habitat.
2. Work will be supervised at all times by an onsite individual from DOE or by an authorized representative familiar with Preble's and its habitat needs.
3. In the unlikely event that a Preble's (dead, injured, or hibernating) is located during any proposed activities, the Service's Colorado Ecological Services Field Office of the Service (303) 275-2370 or the Service's Law Enforcement Office (303) 274-3560 will be contacted immediately.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed actions. If, during the course of the action, this level of incidental take (loss of 30 acres of potential Preble's habitat over a 5-year period) is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. DOE 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 the 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 are discretionary agency activities that may be used 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 Service believes that the Plan will contribute to the conservation of the Preble's on RFETS lands.

#### **REINITIATION NOTICE**

This concludes formal consultation on the implementation of the Rock Creek Reserve Integrated Natural Resources Management Plan and Environmental Assessment through Calendar Year 2006. As required by 50 CFR 402.16, reinitiation of formal consultation is required 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 adverse 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

Mr. Joseph A. Legare

Page 7

where incidental take exceeds the amount authorized, any operations causing such take must cease pending reinitiation.

If you have any questions or would like to discuss this in more detail or we can be of further assistance, please contact Kathleen Linder of my office at (303) 275-2370.

Sincerely



LeRoy W. Carlson  
Colorado Field Supervisor

cc: FWS:GJ (L. Bjornestad)  
FWS:Regional Office (B. McCue)  
DOE - RFETS (C. Franklin)  
Jefferson County (N. Neelan)  
Boulder County (P. Fogg)  
Reading File  
Linder

Ref:KAL\rckyflats\RockCrkProgBO.wpd

## REFERENCES

- Armstrong, D.M., M.E. Bakeman, A. Deans, C.A. Meaney, and T.R. Ryon. 1997. Report on habitat findings of the Preble's meadow jumping mouse. Boulder (CO); report to the U.S. Fish and Wildlife Service and Colorado Division of Wildlife. 91 pp.
- Compton, S.A., and R.D. Hugie. 1993. Status report on *Zapus hudsonius preblei*, a candidate endangered subspecies. Logan (UT): Pioneer Environmental Consulting Services Inc.; under contract with the U.S. Fish and Wildlife Service. 32 pp.
- Compton, S.A., and R.D. Hugie. 1994. Addendum to the status report on *Zapus hudsonius preblei*, a candidate subspecies. Logan (UT): Pioneer Environmental Services, Inc.; under contract with the U.S. Fish and Wildlife Service. 8 pp.
- Krutzsch, P.H. 1954. North American jumping mice (genus *Zapus*). University of Kansas Publications, Museum of Natural History 7:349-472.
- Shenk, T. 1998. Conservation assessment and preliminary conservation strategy for Preble's meadow jumping mouse (*Zapus hudsonius preblei*). Fort Collins (CO): Colorado Division of Wildlife. 38 pp.



## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Ecological Services  
Colorado Field Office  
755 Parfet Street, Suite 361  
Lakewood, Colorado 80215

WMP  
eg to Beth DeCham

**IN REPLY REFER TO:**

ES/CO: Rocky Flats/Well Abandonment  
Mail Stop 65412

FEB 24 2003

Joseph A. Legare  
Assistant Manager for Environment & Stewardship  
United States Department of Energy  
Rocky Flats Field Office  
10808 Highway 93, Unit A  
Golden, Colorado 80403-8200

**RE: Well Abandonment and Replacement Program 2003-2006**

This letter is in response to your Rocky Flats Well Abandonment and Replacement Program (WARP) biological evaluation and request for informal consultation received by the U.S. Fish and Wildlife Service on 18 December 2002. The Service requested additional information on 23 December 2002; the response to that request was received on 21 January 2003. The evaluation and addendum described the removal of 165 groundwater monitoring wells within the currently designated Preble's Meadow Jumping Mouse Protection Area at Rocky Flats during the period from 2003 through the completion of cleanup (approximately 2006).

As described in the biological evaluation, 96 wells will be removed with hand tools only, 66 will require a forklift to elevate and remove a supporting concrete pad, and 3 wells will require the use of a backhoe and forklift to excavate around the well structure and to remove the structure. The small wells comprised of polyvinyl chloride (PVC) pipe and wells requiring a forklift for removal are the same well types described in a previous biological evaluation that received a concurrence of "not likely to adversely affect" in September 2002. A Service biologist visited the locations of the wells needing excavation for removal (#B304989, #1686, #1486) on 15 January 2003. Although these wells will require more extensive treatment than the other well types, the locations are in poor quality habitat or are situated close to frequently used roads.

The Service concurs with your determination that the Rocky Flats Well Abandonment and Replacement Program, conducted with the precautions noted in your biological evaluation and addendum, will not adversely affect the Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*) within the currently designated protection area. This concurrence does not apply to activities conducted in the proposed critical habitat (67 FR 137; 47153-47120). Additional consultation will be required if the scope of any of the well removals exceeds the description contained in the evaluation.

If the Service can be of further assistance please contact Beth Dickerson, Rocky Mountain Arsenal National Wildlife Refuge, at 303-966-6436.

Sincerely,

A handwritten signature in black ink, appearing to read "LeRoy W. Carlson". The signature is written in a cursive style with a long horizontal flourish at the end.

LeRoy W. Carlson  
Colorado Field Supervisor

cc: Cliff Franklin, DOE, Rocky Flats  
Dean Rundle, USFWS, Rocky Mountain Arsenal NWR  
Ari Cornman, USFWS, CFO



## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

Ecological Services  
Colorado Field Office  
755 Parfet Street, Suite 361  
Lakewood, Colorado 80215

APR 09 2003

#### IN REPLY REFER TO:

ES/CO: Rocky Flats Critical Habitat/Well Abandonment  
Mail Stop 65412

Cliff Franklin  
Team Lead for Infrastructure and Stewardship  
United States Department of Energy  
Rocky Flats Field Office  
10808 Highway 93, Unit A  
Golden, Colorado 80403-8200

**RE: Well Abandonment and Replacement Program in Proposed Critical Habitat**

Dear Mr. Franklin:

The U.S. Fish and Wildlife Service (Service) received your electronic mail dated 1 April 2003 requesting informal conferencing on the Well Abandonment and Replacement Program (WARP) within the proposed critical habitat for the Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*) at Rocky Flats. This activity will involve the removal of 92 polyvinyl chloride pipes—removed by hand; 50 wells that require a forklift for removal and transport; and 7 wells that require a small excavation for removal. A Service biologist reviewed the conference request, examined the location of the wells in the proposed critical habitat area, and conferred with the Rocky Flats Senior Ecologist.

On 24 February 2003, the Service issued a concurrence of DOE's "may affect, but is not likely to adversely affect" determination for the WARP in the current Preble's Protection Area at Rocky Flats. The current request is for the same project, but a slightly different area. The WARP procedures described in this request are the same as the procedures for well removal in the Protection Area; therefore, the same best management practices need to be applied to this area as well:

- use established roads where ever possible
- conduct work when the ground is dry or frozen
- place stockpiled soils on tarpaulins or boards
- place mats or boards on ground if driving on soft soil is required
- vegetation disturbance will be avoided especially in riparian areas

- well pad sites will be reseeded with appropriate native species
- work will be conducted during daylight hours
- only the vehicles necessary to remove the wells will be driven to the wells
- vehicles driven off-road will utilize one track in and out of the area

Given this is the same project as addressed in our February 24, 2003 letter and that the best management practices listed above will be implemented, the WARP within the critical habitat area is covered under the Service's concurrence of 24 February with no further consultation necessary. However, further consultation could become necessary if the scope of the project exceeds the submitted description, pertinent information becomes available that was not used in this analysis, or a new species or critical habitat is listed that could be affected by the project.

If the Service can be of assistance, please contact Beth Dickerson at (303) 966-6436.

Sincerely,



LeRoy Carlson  
Colorado Field Supervisor

cc: Cliff Franklin, DOE, Rocky Flats  
Dean Rundle, FWS, Rocky Mountain Arsenal  
Beth Dickerson, FWS, Rocky Mountain Arsenal

**Biological Evaluation**  
**Well Abandonment and Replacement Program (WARP)**

The Groundwater group at the Rocky Flats Environmental Technology Site (Site) is abandoning several old groundwater wells in the Rock Creek drainage that are located within areas currently designated under the Preble's Meadow Jumping Mouse Protection Plan (DOE 2002) as part of the Preble's meadow jumping mouse protection area at the Site (Preble's mouse; *Zapus hudsonius preblei*). As part of the abandonment program and the Site cleanup, the well heads must be removed from the Buffer Zone.

A total of five wells are located within the Preble's mouse habitat (#B102289, #B102389, #63895, #B202489, #B202589; Figure 1). All but one (#B102389) are located on the stream terraces outside of the actual woody riparian vegetation along the stream. The photographs in Figure 2 show the position of each of the wells in relation to the woody riparian habitat. Well #B102389 sits adjacent to some coyote willow (*Salix exigua*) along the stream, but no removal of the coyote willow is necessary for removal of the well. Four of the wells sit on 3 ft. x 3 ft. concrete pads with steel well casings extending above ground. The fifth well is a one inch PVC pipe well with a 6 in. diameter concrete pad surrounding it. The PVC pipe well (#63895) is located near the tall upland shrubland on the hillside above the wetland area. Additionally two of the wells, #B102289 and #B102389 are located within jurisdictional wetlands, as mapped by the U.S. Army Corps of Engineers in 1994 (COE 1994).

The well abandonment process for the 4 larger wells will involve removing both the concrete pad and above ground well housing, plus a portion of the well casing. This follows Site procedures and State of Colorado Rules and Regulations for removal and abandonment of groundwater wells. Sand and/or bentonite are poured into the well to plug the hole to approximately 4 ft. below ground level. Then the well casing is cut off from the inside approximately 3 ft. below ground. To remove the concrete pad and above ground well housing a special forklift will be driven to the well and the concrete pad and well housing lifted up and driven back to the nearest roadside for removal by truck. The route followed by the forklift will be the access roads that have been used for monitoring these wells for years. For the wells in the wetlands, care will be taken to make sure no vehicle damage is done to the wetlands. Access will be limited to dry periods when the ground is not soft or boards will be placed over soft ground areas to prevent damage to the wetland areas. Cement is then hand mixed and poured into the well on top of the bentonite to permanently seal the well hole at a depth of approximately 2 ft. below ground surface. Soil will then be placed in the old well hole, filling the hole so it forms a slight mound above the ground surface to allow for settling over time. The disturbed area where the concrete pad previously sat will be seeded with the native species western wheatgrass (*Agropyron smithii*), which is common at these locations. Additionally, because of the small size of the disturbances (essentially the size of the concrete pad), the native vegetation surrounding the area will fill in the area naturally as well. The total area impacted by all four wells will be approximately 36 sq. ft. (4 x 9 sq. ft.) The total time to remove a well takes approximately 2-3 hours.

Removal of the smaller PVC pipe well will be done by hand without any heavy machinery or forklift vehicle. The entire length of the PVC pipe will be pulled out by hand or with a small hand winch on a tripod. The hole will be filled with bentonite, and soil will be placed in the hole. The area will be seeded with western wheatgrass. The total area of disturbance will be approximately one square foot. The total time to remove this well is approximately 1-2 hours.

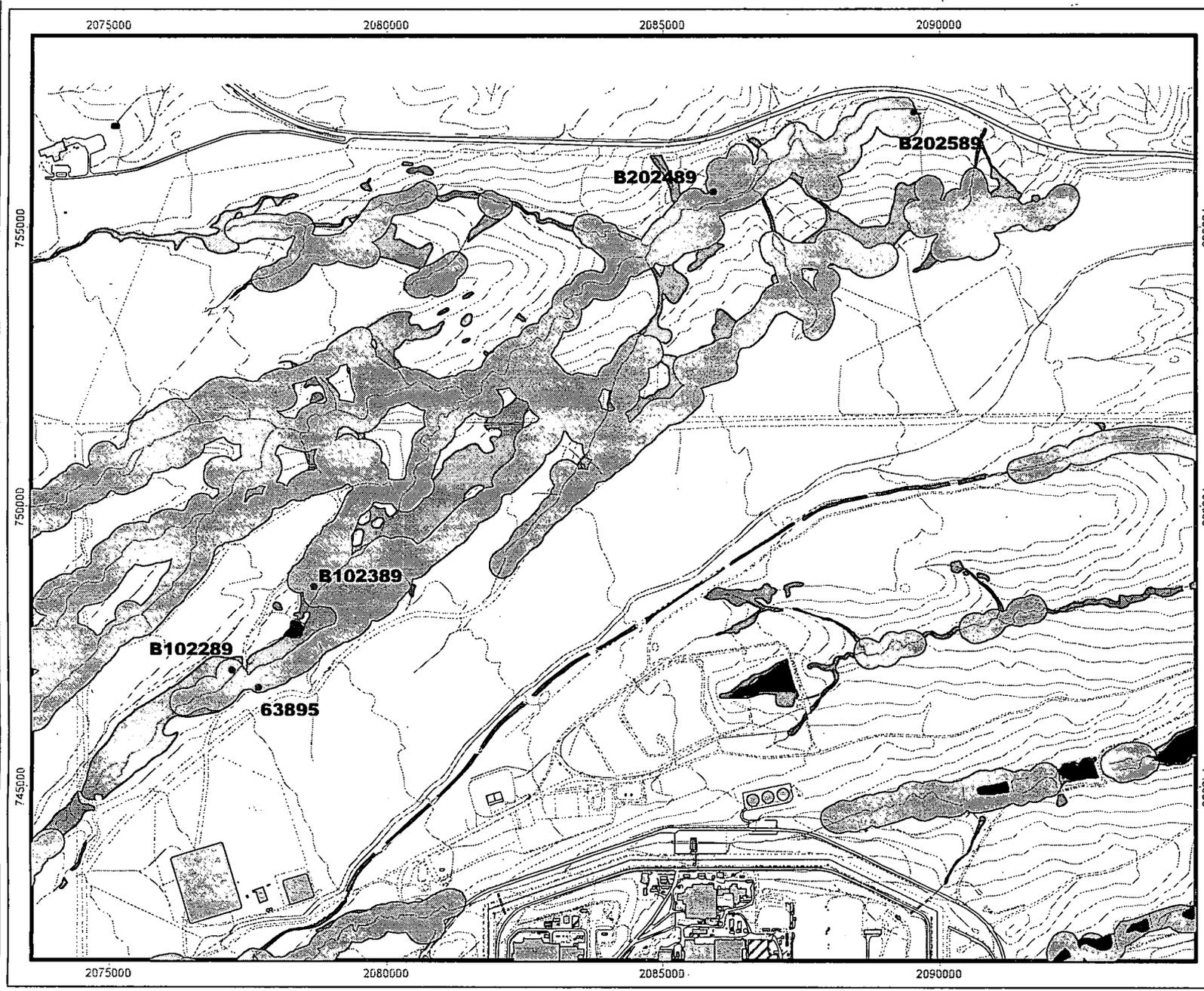
The findings of this biological evaluation indicate that while the well abandonment program, which must be completed as part of the Site cleanup, may effect a small portion of Preble's mouse habitat, there is no adverse effect. The following reasons are provided for why there is no adverse impact:

- Removal of a well will improve Preble's mouse habitat (no more driving to the well for monitoring, so less human disturbance, concrete pad is gone so habitat is actually increased),
- total area impacted by well removal is minimal (37 sq. ft. = total area of approximately 4 ft. x 9.25 ft.),
- temporal impact is only 1-3 hours per well (this is not much more than the time it takes to go and monitor the wells as part of their regular schedule),
- no disturbance or removal of any riparian woody vegetation is required,
- removal activities will occur during the daylight hours when the Preble's mouse is inactive.

**References**

COE. 1994. Rocky Flats Plant Vegetation Mapping and Resource Study. U.S. Army Corps of Engineers, Omaha District. December 1994.

DOE. 2002. Preble's Meadow Jumping Mouse Protection Plan for The Rocky Flats Environmental Technology Site. U.S. Department of Energy. Rocky Flats Environmental Technology Site. January.



# Rock Creek Abandoned Well Locations

## Figure 1

- LEGEND**
- Preble's Protection Areas
  - Contiguous Wetlands
  - Abandoned Well Locations

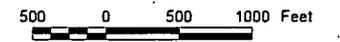
- Standard Features**
- Buildings
  - Demolished Buildings
  - Lakes & ponds
  - Streams & ditches
  - Fences
  - Paved roads
  - Dirt roads
  - Contours (20 ft. intervals)

**DATA SOURCE BASE FEATURES:**  
 Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RET, Las Vegas. Digitized from the ortho-photograph, 1985.

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1:10585



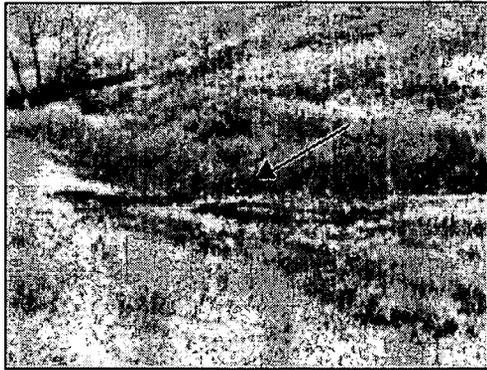
State Plane Coordinate Projection  
 Colorado Central Zone  
 Datum: NAD27

U.S. Department of Energy  
 Rocky Flats Environmental Technology Site

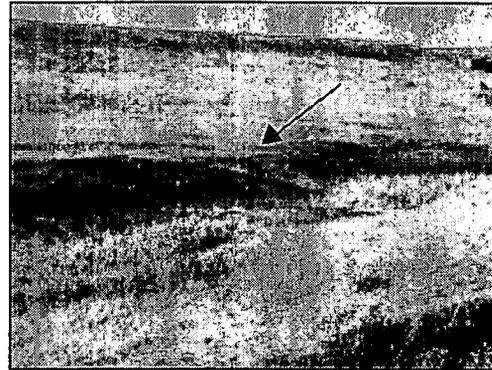
Prepared by: **LABAT** For: **ICM** Camer-Hill Company, LLC

MAP ID: 02-007 RFTS GIS Dept. 303-986-7707 May 29, 2002

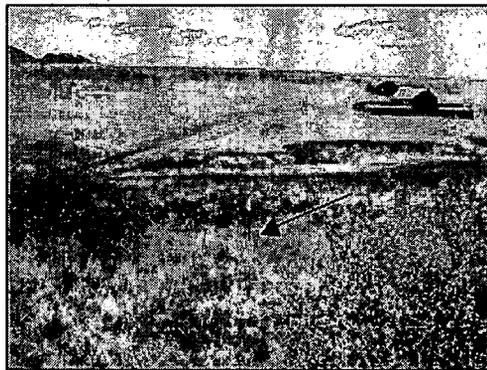
© 1994 EG&G RET, Las Vegas. Digitized from the ortho-photograph, 1985.



Well # B102389



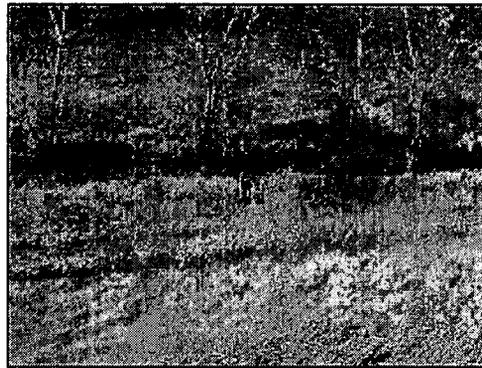
Well # B102289



Well # 63895



Well # B202489



Well # B202589

Figure 2. These photographs show the locations of the wells that are within the Preble's mouse protection areas in the Rock Creek drainage at the Site.



**United States Department of the Interior**

**FISH AND WILDLIFE SERVICE**  
 Ecological Services  
 Colorado Field Office  
 755 Parfet Street, Suite 361  
 Lakewood, Colorado 80215

**IN REPLY REFER TO:**

ES/CO: Rock Flats/Well Rock Creek Res.  
 65412 Lakewood

SEP 18 2002

Joseph A. Legare  
 Assistant Manager for Environment & Stewardship  
 United States Department of Energy  
 Rocky Flats Field Office  
 10808 Highway 93, Unit A  
 Golden, Colorado 80403-8200

**RE: Well Abandonment and Replacement Program**

Dear Mr. Legare:

This letter is in response to the biological evaluation and request for informal consultation for well abandonment in the Rock Creek Reserve. The wells indicated for abandonment are #63895, #B102289, #B102389, #202489, and #202589.

The Fish and Wildlife Service has reviewed your project proposal and visited the well locations and concurs with your determination that the proposed project conducted with the following procedural precautions is not likely to adversely affect the Preble's meadow jumping mouse (*Zapus hudsonius preblei*) or the proposed critical habitat for the mouse (Federal Register 67 (137):47154-47210).

**Procedural precautions:**

- Established roads, where available, will be used to access all sites.
- While approaching and working around wells, the smallest area accommodating the minimum necessary equipment will be used.
- All work will concentrate activity away from the drainage or on the uphill side of the well.
- Work will be performed when the ground is dry and can support the weight of equipment without creating ruts or destruction of vegetation cover.
- Well #63895 will be approached only on foot from the nearest road.
- Care will be taken to protect shrubs and small trees around all wells particularly the #B102389 site which is dominated by woody vegetation.

Post-It Fax Note 7671

To: **Rosenman, J. Nelson** Date: **9-17-02**

Collect: **Franklin**

Phone #: **3578**

Fax #: **3578**

From: **Franklin**

Co.:

Phone #:

Fax #:

If the Service can be of further assistance, please contact Beth Dickerson, Rocky Mountain Arsenal National Wildlife Refuge, at (303) 966-6436 or (303) 289-0995. Refer to consultation ES/RF1.

Sincerely,



LeRoy Carlson  
Colorado Field Supervisor

pc: Cliff Franklin, DOB, Rocky Flats  
Dean Randle, FWS, Rocky Mountain Arsenal  
Ari Corzuman, FWS, CO ES Field Office  
Beth Dickerson, FWS, Rocky Mountain Arsenal

## Biological Evaluation Power line Removal Project

As the cleanup and closure of the Rocky Flats Environmental Technology Site (Site) proceeds, many of the manmade structures in the Buffer Zone will be removed as they are no longer needed. Recently two power lines were decommissioned and will soon be removed. A few of the power line poles however, are located within areas currently designated by the Preble's Meadow Jumping Mouse Protection Plan (DOE 2002) as part of the Preble's meadow jumping mouse (Preble's mouse, *Zapus hudsonius preblei*), protection area at the Site (Figure 1). This evaluation has been prepared to describe the project and what is being done to avoid and minimize any detrimental impacts to the Preble's mouse and its habitat.

The two power lines to be removed from the Buffer Zone differ in size and location. Line A is a single-pole power line that runs from the south/western corner of the Site to the middle of the eastern side of the Site (Figure 1). There is also a small section of this line that is farther east of the main part of Line A that will be removed as well (Figure 1). Line B is a double-pole power line that runs east and west just south of the Industrial Area (IA; Figure 1). It runs along the north side of Woman Creek, and then turns north and enters the IA. (Figure 1). All stretches of both power lines are accessible either by an established road or right-of-way maintenance roads. The power line removal is scheduled to occur in September 2002 during the driest period of the year so as to have minimal impact on the vegetation and ground surface.

The power line removal will involve detaching the wires from the poles, removing all the hardware and other equipment used to attach the wires to the poles, and then removing the poles themselves. The detachment of the wires and hardware removal are accomplished by driving a bucket truck to the base of the pole and lifting the worker to the top of the pole to do the work. Typically the wires are detached, slowly lowered to the ground, and then pulled from one end and wound onto a wire spool. Then the line hardware and cross-bracing is removed from the poles. The bucket truck is then replaced by a line truck (truck with a large boom or crane on it). The line truck attaches a line to the top of the pole and the pole is then cut at ground-level and lowered to the ground. The attached line is then repositioned to the center of balance on the pole so it can be lifted up and placed on a trailer for removal. The poles will be cut into approximately ten-foot sections for disposal. The designated cutting location will not be in any sensitive areas (e.g., wetlands, Preble's mouse habitat).

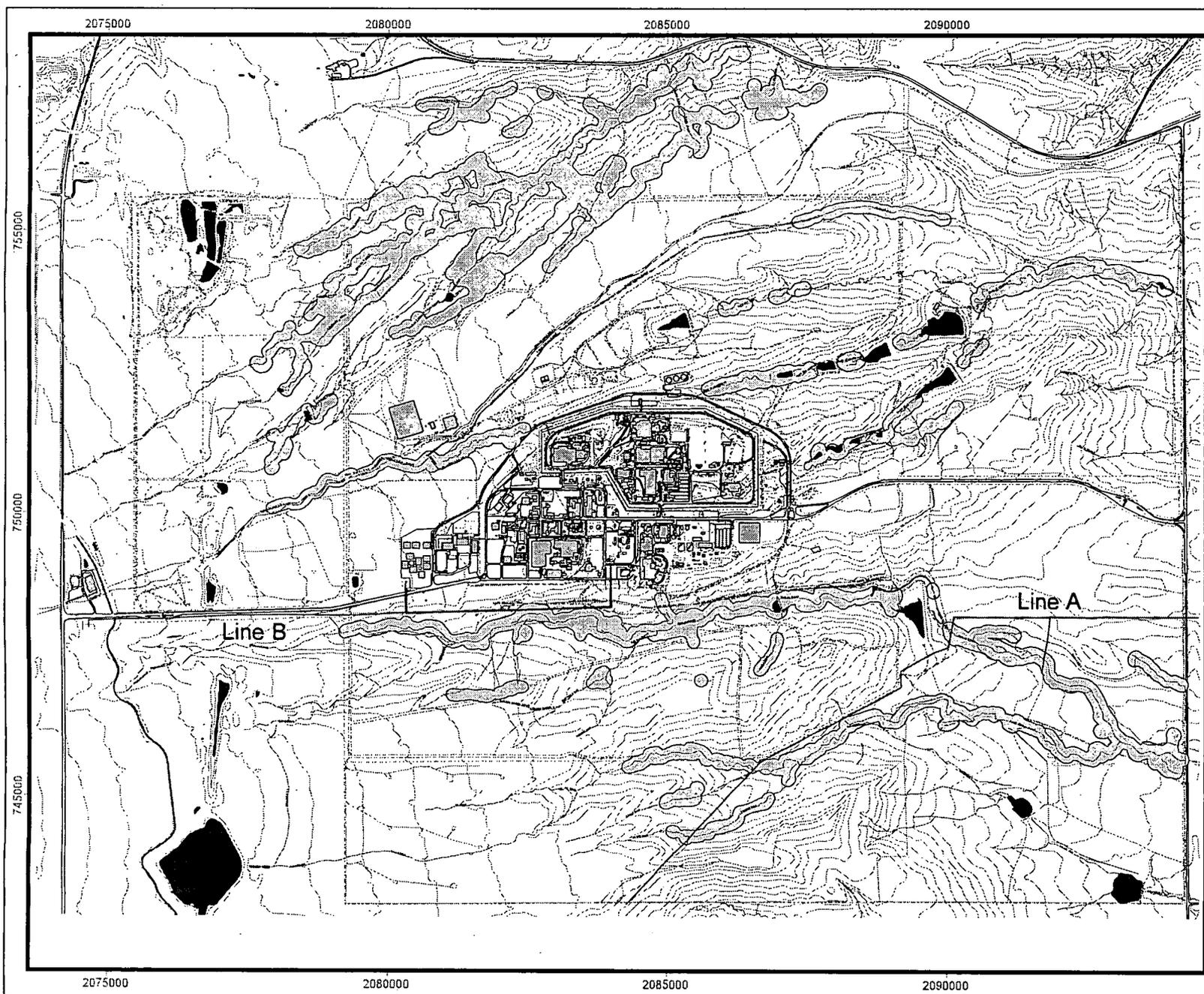
For the removal of Line A there are several locations where the power lines cross Preble's mouse habitat (Figure 1). At these sites a bucket truck will be driven to the power pole that is within the Preble's habitat. The truck will be driven in and out on the same tracks. Rather than dropping the wire to the ground in one long piece that is then dragged through the habitat, the wire will be cut at the power pole so that both ends will fall away from the habitat. Because the wire on these poles is fairly thin and not very heavy, little damage to the habitat will occur if part of the line is lowered into the habitat. The wire will then be picked up and/or pulled out of the habitat away from the stream to minimize any impacts. No vehicles will need to be driven across the stream at any of these locations. A line truck will replace the bucket truck and the pole will be removed as described in the paragraph above. A second truck with the trailer attached will be positioned next to the line truck so the pole can be lifted onto the trailer. This method will be utilized to minimize damage to the vegetation and ground surface.

For Line B, the larger, double-pole power line, there is a location where the line crosses through both Preble's mouse habitat and part of the Original Landfill (OLF). Both areas generally overlap one another. Because of a potential for contamination at the OLF, the power lines will be lowered to the ground across the OLF and then cut outside the OLF radiological boundary. The power line within the OLF boundary will then be rolled onto a separate spool, with radiological sampling conducted during the spooling process. Due to the short distance of wire that will be pulled through the OLF and Preble's habitat, little disturbance is expected to occur to the habitat. The power lines outside the OLF will then be spooled, pulling the wire away from the Preble's habitat. The power poles will be removed as described above. The bucket truck and line truck will be driven separately on an old existing access road to the base of the power poles located within the Preble's habitat. No leveling of the ground will be necessary to complete the work. The truck and trailer that will carry the poles will remain on the South Interceptor Ditch (SID) road.

Other options for removing the power lines for Line B were explored, including the use of a pulley system to take the line completely out of the Preble's habitat and OLF boundary. However, on discussing this option with the company that will be removing the line, the rope they use for the pulley system is larger than the power lines themselves and so would not result in any less impact than simply laying the power lines on the ground and pulling them out.

The findings of this biological evaluation indicate that while the power line removal project which must be completed as part of the Site cleanup, will in part take place in a small portion of Preble's mouse habitat at the Site, there will be no adverse effect. The following reasons are provided for why there is no adverse impact:

- All removal activities will occur during the time of the Preble's mouse inactivity (daylight hours).
- Although the power line removal will occur during September, the timing is scheduled to take advantage of the dry conditions this year and typical of early fall so as to have minimal damage to the habitat.
- Removal of the power lines will improve Preble's mouse habitat. There will be no more driving along the power line for monitoring of the line, so there will be less human disturbance.
- Vehicles will be maneuvered into and out of Preble's habitats in such a way that will minimize disturbance.
- The power poles will be lifted out of Preble's mouse habitat to minimize vegetation and soil disturbance.
- No removal of any riparian woody vegetation is required.



# Power Line Removal Project

## Figure 1

### LEGEND

-  Preble's Mouse Protection Area
-  Decommissioned Power Lines

### Standard Features

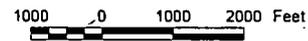
-  Buildings
-  Demolished Buildings
-  Lakes & ponds
-  Streams & ditches
-  Fences
-  Paved roads
-  Dirt roads
-  Contours (20 ft. intervals)

**DATA SOURCE BASE FEATURES:**  
Buildings, fences, hydrography, roads and other structures from 1994 aerial imagery data captured by EG&G RSL, Las Vegas. Digitized from the orthophotograph, 1995.

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1:22209



State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD27

U.S. Department of Energy  
Rocky Flats Environmental Technology Site

Prepared by: **LABAT** For: **Kaiser-Hill Company, LLC**

RFETS GIS Dept 303-866-7707  
MAP ID: 02-0015 August 19, 2002

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United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Ecological Services  
Colorado Field Office  
755 Parfet Street, Suite 361  
Lakewood, Colorado 80215

IN REPLY REFER TO:  
ES/CO: Power Line/Rocky Flats  
Mail Stop 65412 Lakewood

October 1, 2002

Joseph A. Legare  
Assistant Manager for Environment & Stewardship  
United States Department of Energy  
Rocky Flats Field Office  
10808 Highway 93, Unit A  
Golden, Colorado 80403-8200

RE: Power line Removal Project

Dear Mr. Legare:

This letter is in response to your biological evaluation and request for informal consultation for the removal of two decommissioned power lines in the buffer zone at the Rocky Flats Environmental Technology Site. The two power lines, designated as Line A and B, are situated south of the Industrial Area. Sections of Line A pass through protected Preble's meadow jumping mouse habitat along Women Creek, Smart Ditch and Poorwill Draw. A portion of Line B is located in protected habitat in the Old Landfill.

The Fish and Wildlife Service has reviewed the submitted evaluation, visited the project site, conferred with the Senior Ecologist at Rocky Flats and concurs with your determination that the proposed project is not likely to adversely affect the Preble's meadow jumping mouse (*Zapus hudsonius preblei*) or the proposed critical habitat (67 Federal Register [137] 47154-47210).

In light of numerous projects associated with cleanup of the Rocky Flats Environmental Technology site that will be conducted in the Woman Creek area below the South Interceptor Ditch, cumulative effects of addition disturbances to the area will be considered in future evaluations submitted. If the Service can be of assistance, please contact Beth Dickerson at (303) 966-6436 or (303) 289-0995. Refer to project ES/RF3.

Sincerely,

*LeRoy Carlson*  
LeRoy Carlson  
Colorado Field Supervisor

pc: DOE, Rocky Flats Cliff Franklin  
FWS, Rocky Mountain Arsenal Dean Rundle,  
FWS, ES Field Office Ari Curman,  
FWS, Rocky Mountain Arsenal Beth Dickerson,

Ref: dsl/naydoc/concurrencepowerlinremovalESRF3

Post-it <sup>®</sup> Fax Note	7871	Date	10-2-02	From	Cliff Franklin	To	Joseph A. Legare
To	J. A. Legare	City	Golden	Co.	CO	Phone #	
City		Phone #		Fax #	3578		

5476

**Amendment**  
**Power line Removal Project**

As per our conversation and project site tour with Beth Dickerson, USFWS, on January 15, this write-up describes additional powerlines to be removed in the Buffer Zone area at the Rocky Flats Environmental Technology Site. Please refer to the Biological Evaluation on the Power Line Removal Project submitted to the USFWS on August 27, 2002 and the USFWS response dated October 1, 2002.

Removal of power lines in the Buffer Zone continues this year with plans being made to remove three power lines that are no longer being used. Some of the power line poles however, are located within areas currently designated by the Preble's Meadow Jumping Mouse Protection Plan (DOE 2000) as part of the Preble's meadow jumping mouse (Preble's mouse, *Zapus hudsonius preblei*), protection area at the Site and within proposed critical habitat for the mouse (USFWS 2002; Figure 1). This document describes the project and what is being done to avoid and minimize any detrimental impacts to the Preble's mouse and its habitat.

The three power lines to be removed from the Buffer Zone are all similar in size to the smaller power line described in the original Biological Evaluation. They are located in different areas of the Buffer Zone. For this description they have been designated as the Doppler Line, A-Series Line, and the B-Series Line (Figure 1). The Doppler Line is located in the south-west part of the Buffer Zone and runs south from the main access road and across Woman Creek. This line was used to power a piece of equipment that was located on top of the ridge just south of Woman Creek. The A-Series Line and the B-Series Line are located in the North-East Buffer Zone and run alongside the A-Series ponds and B-Series ponds, respectively. All three lines are single-pole power lines. Where present, the wires on these lines vary in thickness, but none are larger than one inch in diameter and all are fairly light. Only the Doppler Line has any cross-bracing at the top of the poles that will need to be removed prior to cutting the pole.

The Doppler Line crosses Preble's mouse habitat once, and only one pole is located current Preble's protection area. Six of the seven poles are within the proposed critical habitat. A bucket truck will be used to cut the wire, cross-bracing and hardware from the top of the poles. The pole that is located in Preble's protection area is located north of Woman Creek. An existing road runs right next to the pole. The wire spanning the Preble's protection area will be cut so the majority of it will fall away from the habitat. The wire will then be hand-pulled from the area, rolled up, and removed. The pole will be cut at ground level in such a way that it drops onto the existing road. To access and remove the other poles, the bucket truck will be driven from the closest road, and will utilize only one set of tracks to enter and exit the area to minimize grassland disturbance. The poles will removed and stored temporarily at a designated location until they are removed from Site. The temporary storage location for any poles and other equipment will be located on established roads. The existing access road to the north of the stream, is a two track dead-end, and once the Doppler Line is removed, a portion of this road will be closed to all traffic.

At the A-Series line there are 8 poles to be removed that fall within the current Preble's protection areas, however, all the poles in this line are within the proposed critical habitat. On the western end, the line is located south of the stream, but just west of the A-1 pond it crosses to the north side of the stream. This line has not been used for several years and the wire is missing from many of the poles, including the stretch that crosses the stream. No cross-bracing is present on the poles in this line. Access to the poles on the south side of the stream is relatively easy because they are located along an established road. The same is true of the poles located east of the A-2 pond dam, with the exception of one pole. However, the poles on the north side of the stream, adjacent to the A-1 and A-2 ponds are not accessible by a road. These poles will be approached on foot. Using a chain saw, the poles will be cut so they fall away from the stream and Preble's mouse habitat. A chain will be attached to one end of the pole, that end will be raised off the ground and attached to a backhoe, which will then pull the pole out of the area and onto an established road. To remove the one pole located in the middle of the drainage, west of the A-1 pond, it will be approached on foot and cut using a chainsaw at ground level in such a way that it falls to the south away from the dense coyote willow in the area. Then a cable and winch will be used to pull the pole to the road south of the area. The vegetation between the pole and the road consists mainly of smooth brome, which was used to revegetate the area in the past. The poles will be temporarily stored in a designated

location until they are removed from the Site. The temporary storage location for any poles and other equipment will be located on established roads.

The B-Series Line runs on the north side of the B-Series ponds in that drainage. Six of the poles are located within the current Preble's protection area. All of the poles are within the proposed critical habitat. Vehicles will access the north side of the stream using roads that cross the tops of the dams. None of the poles in this line have cross-bracing. Most poles will be cut with wiring still attached to the pole and the wire will be used to pull the poles out of the area. One pole on the north side of the B-3 pond is surrounded by coyote willow. At this location the willow will be clipped to about two feet high to provide access to the pole. The pole is located in an IHSS area, so it will be cut at about a four foot height. The pole will be cut in such a way that it will fall away from the pond. A backhoe will be used to pull the poles out one at a time up-slope from the stream and ponds. The poles will be temporarily stored in a designated location until they are removed from the Site. The temporary storage location for any poles and other equipment will be located on established roads.

The findings of this biological evaluation indicate that while the power line removal project which must be completed as part of the Site cleanup, will in part take place in a small portion of Preble's mouse habitat at the Site, there will be no adverse effect. The following reasons are provided for why there is no adverse impact:

- Removal of the power lines will improve Preble's mouse habitat. There will be no more need for maintenance of the line, so there will be less human disturbance.
- At many locations, the poles are located adjacent to roads and will require no off-road driving. At those locations away from the road, where vehicles are necessary, they will be maneuvered into and out of Preble's habitat in such a way that will minimize disturbance. At several of the locations, the poles will be accessed on foot and removed by pulling them out with a cable.
- Vehicle access will be limited to the vehicle required to remove the pole, so disturbance to the area will be minimized.
- Limited off-road vehicle access will minimize potential impacts to mice in their hibernacula.
- The amount of time required to remove all the poles should only be a few days, so the temporal impacts will be minimal, and current plans are to have the poles removed before the mouse comes out of hibernation.
- The A-Series line and B-Series line areas are likely to be disturbed again in the next couple of years when the pond sediments are remediated and the dams are removed.

#### References

DOE. 2000. Preble's Meadow Jumping Mouse Protection Plan for The Rocky Flats Environmental Technology Site. U.S. Department of Energy. Rocky Flats Environmental Technology Site. January.

USFWS. 2002. Endangered and Threatened Wildlife and Plants: Designation of Critical Habitat for the Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*); Proposed Rule. 50 CFR, Part 17. July 17, 2002.

# 2003 Power Line Removal Project

## Figure 1

### LEGEND

-  Proposed Critical Habitat
-  Preble's Mouse Protection Area
-  Decommissioned Power Poles

### Standard Features

-  Buildings
-  Demolished Buildings
-  Lakes & ponds
-  Streams & ditches
-  Fences
-  Paved roads
-  Dirt roads
-  Contours (20 ft. intervals)

**DATA SOURCE BASE FEATURES:**  
Buildings, fences, hydrography, roads, and other structures from 1994 aerial fly-over data captured by EG&D RFL, Las Vegas. Digitized from the orthophotographs, 1995.

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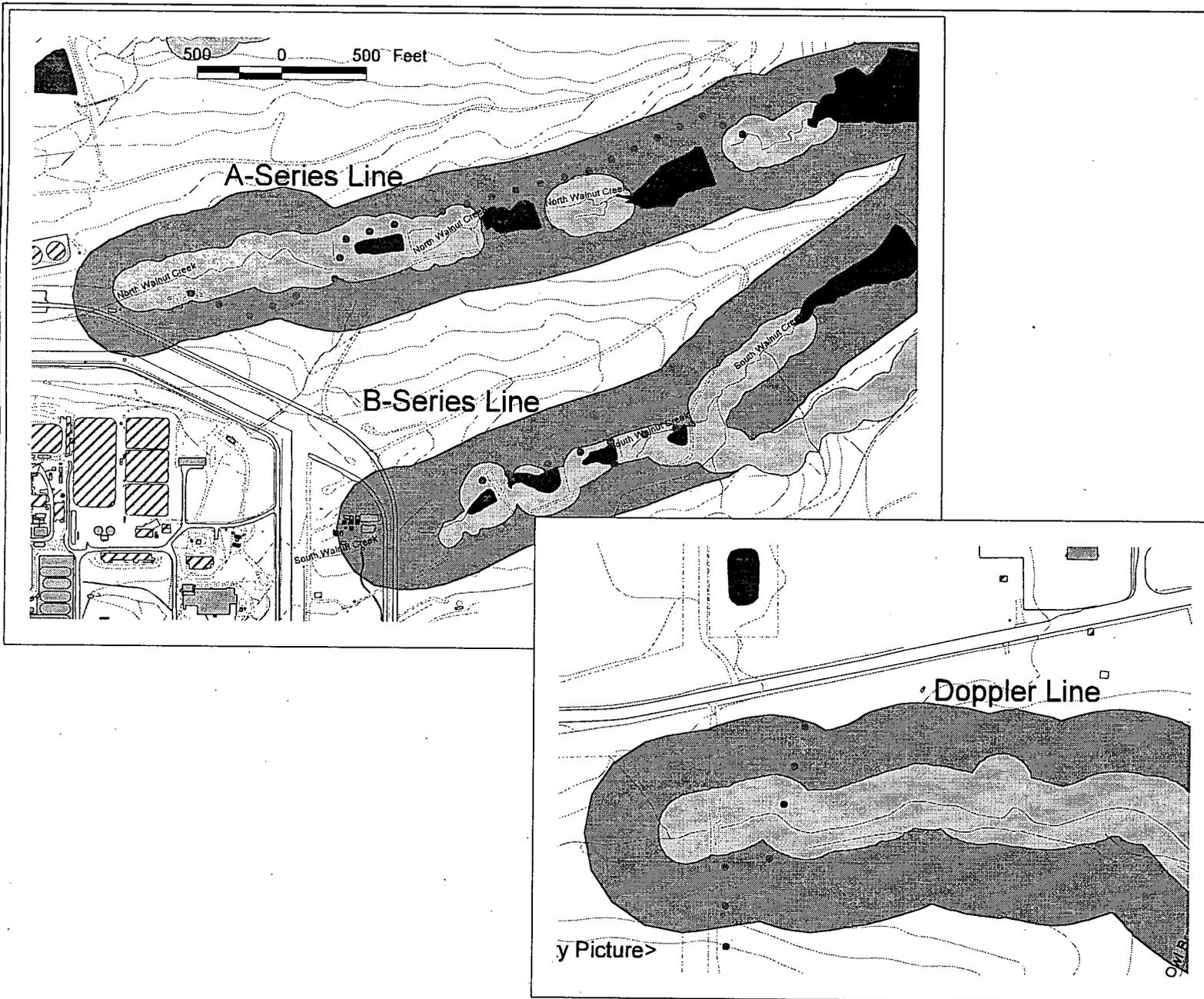


State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD27

U.S. Department of Energy  
Rocky Flats Environmental Technology Site

Prepared by: **LABAT** For: **Kaiser-Hill Company, LLC**

RFETS GIS Dept: 303-866-7707  
MAP ID: 03-0008 January 15, 2003





## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

Ecological Services

Colorado Field Office

755 Parfet Street, Suite 361

Lakewood, Colorado 80215

**IN REPLY REFER TO:**

ES/CO: Rocky Flats/Power Line Removal  
Mail Stop 65412

APR 10 2003

Cliff Franklin  
Team Lead for Infrastructure and Stewardship  
United States Department of Energy  
Rocky Flats Field Office  
10808 Highway 93, Unit A  
Golden, Colorado 80403-8200

**RE: Power Line Removal Project**

Dear Mr. Franklin:

This letter is in response to your biological evaluation for the removal of power lines within the Preble's Meadow Jumping Mouse protection area and the proposed critical habitat for the mouse [67 FR 47154 (July 17, 2002)] at the Rocky Flats Environmental Technology Site. The biological evaluation was received by the U.S. Fish and Wildlife Service (Service) on 3 February 2003. A Service biologist visited the project locations with the Rocky Flats ecologists on 15 January 2003. As described in the biological evaluation, 15 power poles are situated in the protection area along Woman Creek, North Walnut Creek, and South Walnut Creek. An additional 22 poles are located along the three creeks outside of the protected area but within the boundary of the proposed critical habitat.

The Service concurs with your determination that the Power Line Removal Project, conducted with the precautions noted in your biological evaluation and the following additional management practices, will not adversely affect the Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*) within the currently designated protection area or adversely modify the proposed critical habitat.

- the smallest vehicle required to remove the poles from the area will be used in off-road travel;
- off-road activity will be conducted during dry conditions;
- any equipment driven off-road will enter and exit in one track only;
- vehicles will keep the maximum distance from the stream as possible.

Additional consultation will be required if the scope of the project exceeds the description contained in the evaluation.

If the Service can be of further assistance please contact Beth Dickerson, Rocky Mountain

APR-10-2003 THU 04:02 PM HROMD

FAX NO. 303 988 7040

P. 02/04

04/10/03 14:39 FAX 303 275 2371

US FISH & WILDLIFE

003

Page 2

Arsenal National Wildlife Refuge, at 303-966-6436.

Sincerely,



LeRoy W. Carlson  
Colorado Field Supervisor

cc: **Ard Comman, USFWS, ES Colorado Field Office**  
**Beth Dickerson, USFWS, Rocky Mountain Arsenal NWR**  
**Dean Rundle, USFWS, Rocky Mountain Arsenal NWR**

## Biological Evaluation Temporary Flume Project in Woman Creek

The Surface Water group at the Rocky Flats Environmental Technology Site (Site) needs to place a temporary flume in the Woman Creek to initiate water quality monitoring of the upper reach of Woman Creek immediately downstream of the Site's Original Landfill. The flume must be in place and monitoring by this summer to meet the minimum baseline monitoring requirement specified in the Site Integrated Monitoring Plan (IMP). The IMP requires 18 months of surface-water monitoring to establish a water quality baseline prior to the start of significant environmental remediation projects such as remediation of the Original Landfill. The flume location is within an area currently designated under the Preble's Meadow Jumping Mouse Protection Plan (DOE 2002) as part of the Preble's meadow jumping mouse protection area at the Site (Preble's mouse; *Zapus hudsonius preblei*; Figure 1). The flume must be located in the streambed to monitor all surface-water flow, so avoidance of Preble's mouse habitat is not possible. However because this is a small temporary flume only minimal impact is expected. (Please note: Installation of temporary flumes is quite different from the permanent flume installation project that currently is in the formal consultation process with the USFWS.) The flume location is also within a jurisdictional wetland as delineated by the U.S. Army Corps of Engineers at the Site in 1994 (COE 1994). The flume installation in the wetland is covered under Nationwide permit #5, that allows scientific instrument (small flumes) placement in wetlands without wetland mitigation.

The footprint of the flume itself is 3 ft. 5 in. wide by 9 ft. 8 in. long, which will be located completely within the streambed. Installation will be conducted using only hand tools. No heavy equipment is needed for installation. Two small trenches 4 in. wide x 4 in. deep will be dug across the stream channel just large enough to place a 4 in. x 4 in. wooden beam that are used as the attachment points to anchor for the flume. Once the beams are in place in the trenches (one at the head and the other at the foot of the flume), the flume is screwed to the wooden beams. Additional trenching (approximately 4 in. wide x 4 in. deep x 6 ft. long) will be dug on each side of the stream bank to allow placement of the plywood wing walls. The wing walls are attached to the upstream beam and flume to direct water into the flume. The dirt removed from the trench is reused to stabilize the base of the flume and a durable heavy plastic like material is attached to the front of the wing walls and laid across the streambed and streambank to direct water into the flume. At its maximum point (in the stream channel) the plastic tarp material extends approximately 3 ft. in front of the flume and it then angles back to the ends of the wing walls in an arc. This tarp provides a seal for stream inflow to the flume and is held in place with 80 pound sandbags. Small flow monitoring, sampling, and electronic control equipment powered by solar panels are placed 15 to 20 ft. away from the flume (on the stream terrace) that are radio linked to transmit stream flow data and receive commands from a computer system located in one of the trailers in the Industrial Area. Total installation takes approximately 1.5 days. Figure 2 illustrates how the flume is installed and what it looks like completed.

The total area impacted by the flume installation outside the stream channel will be approximately 46 sq. ft. (22 sq. ft. on each side of the stream). The stream channel itself is not being considered as Preble's habitat since the mouse does not live in the stream itself and water flow in the stream is not being altered. The radio telemetry and recording instrumentation will set on a pallet (approximately 11 sq. ft. in total area) approximately 15 to 20 ft. away from the flume on the stream terrace. So the total impact to the Preble's habitat will be approximately 57 sq. ft. (an area roughly 9 ft. x 6 ft.).

The vegetation at the project location includes Nebraska sedge (*Carex nebrascensis*), woolly sedge (*Carex lanuginosa*), arctic rush (*Juncus balticus*), greenscale bulrush (*Scirpus pallidus*), fringed loosestrife (*Lysimachia ciliata*), and some Canada thistle (*Cirsium arvense*). Additionally, sporadic clumps of coyote willow (*Salix exigua*), leadplant (*Amorpha fruticosa*), and chokecherry (*Prunus virginiana*) are also present in the general area (Figure 3). Because the flume installation is conducted using only hand tools, disturbance of the shrubs will be avoided and minimized as much as feasible to make the installation as non-invasive as possible. Therefore little to no disturbance of the shrubs along the stream is anticipated. The small areas of disturbance on the streambank where the soil was disturbed for placement of the wing walls will be seeded with Nebraska sedge, woolly sedge, and arctic rush that have been hand collected in the Woman Creek drainage.

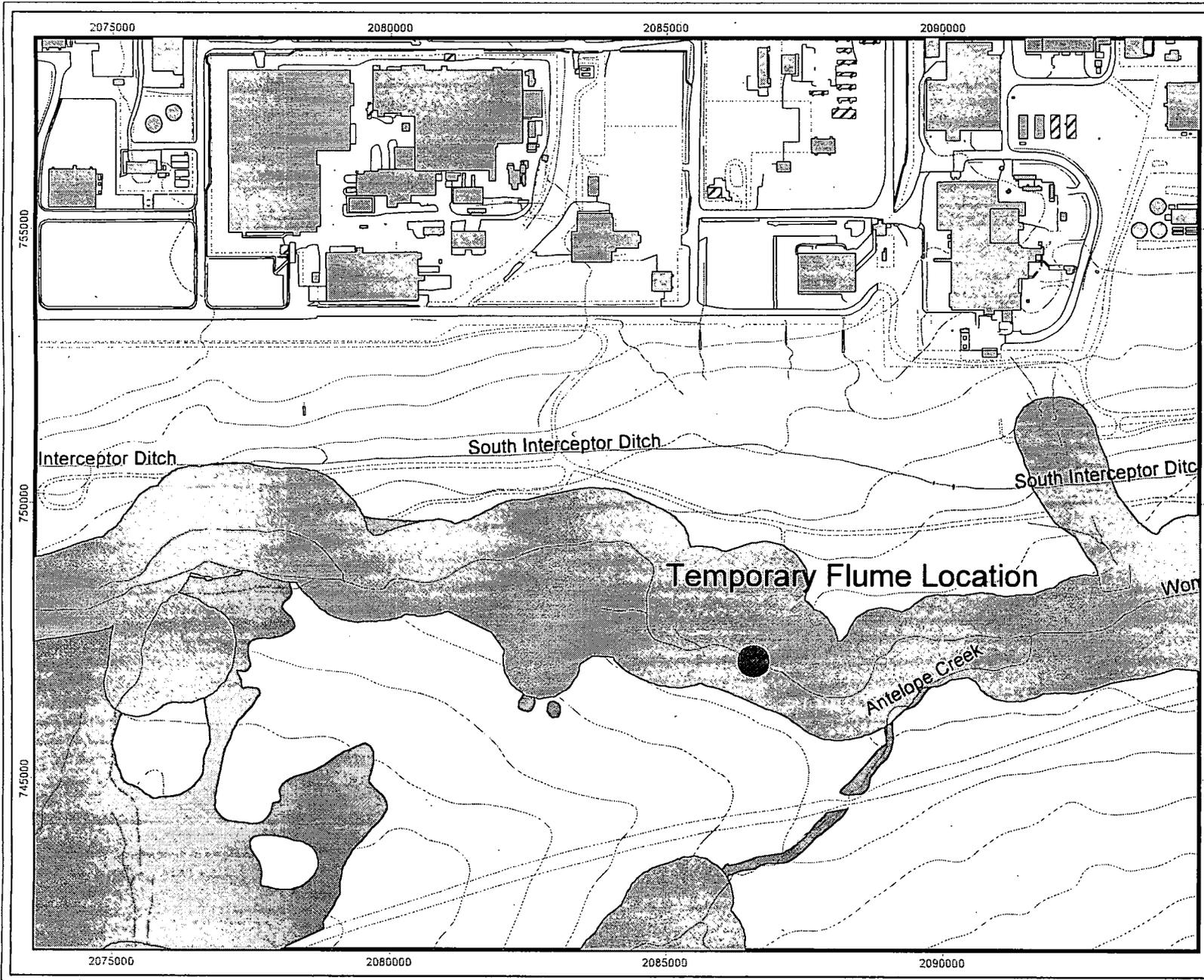
The findings of this biological evaluation indicate that while the flume placement, which must be completed for regulatory compliance, may effect a small portion of Preble's mouse habitat, there is no adverse effect. The following reasons are provided for why there is no adverse impact:

- The total area that will be impacted is approximately 9 ft. x 6 ft. (~57 sq. ft.),
- the project will be completed using only hand tools,
- the flume itself sits entirely within the stream channel,
- disturbance of the shrubs in the area is being avoided as much as feasible,
- construction activity will occur during the daylight hours when the Preble's mouse is inactive,
- it will take only 1.5 days to complete, and
- all equipment will be removed and stream bed restored to original condition after the surface-water performance monitoring for the landfill remediation project is completed.

**References**

COE. 1994. Rocky Flats Plant Vegetation Mapping and Resource Study. U.S. Army Corps of Engineers, Omaha District. December 1994.

DOE. 2002. Preble's Meadow Jumping Mouse Protection Plan for The Rocky Flats Environmental Technology Site. U.S. Department of Energy. Rocky Flats Environmental Technology Site. January.



# Temporary Flume Location Woman Creek

## Figure 1

### LEGEND

-  Temporary Flume Location
-  Preble's Protection Area
-  Contiguous Wetlands

### Standard Features

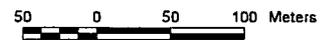
-  Buildings
-  Demolished Buildings
-  Lakes & ponds
-  Streams & ditches
-  Fences
-  Paved roads
-  Dirt roads
-  Contours (20 ft. intervals)

**DATA SOURCE BASE FEATURES:**  
Buildings, linear, hydrography, roads and other structures from 1994 aerial fly-over data captured by ES&S P.E.L. Las Vegas. Digitized from the orthophotographs, 1985.

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State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD27

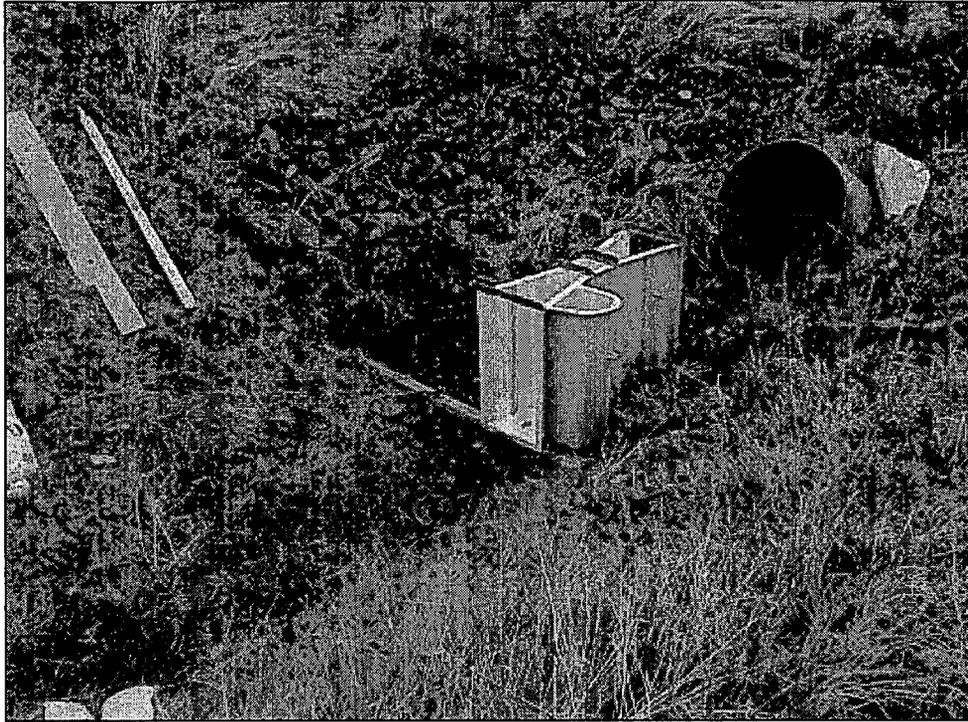
U.S. Department of Energy  
Rocky Flats Environmental Technology Site

Prepared by: **LABAT** For: **Kaiser-Hill Company, LLC**

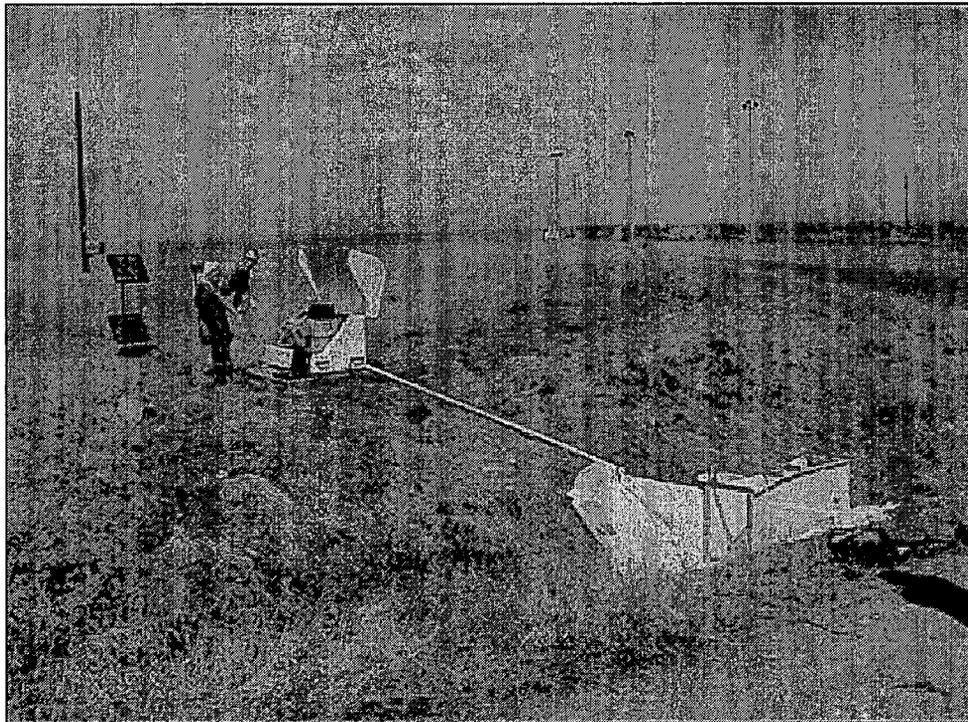
RFETS GIS Dept. 303-866-7707

MAP ID: 02-0008 / May 29, 2002

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A)



B)

Figure 2. Photo A shows how the temporary flume is attached to the buried 4 x 4 beam and how the entire flume is located in the stream channel. Photo B shows the final flume and adjacent telemetry and recording equipment in the small housing on the pallet.



Figure 3. Temporary Flume location in Woman Creek.



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Ecological Services  
Colorado Field Office  
755 Parfet Street, Suite 361  
Lakewood, Colorado 80215

**IN REPLY REFER TO:**

ES/CO: Flume Placement/Woman Creek  
65412 Lkwd

OCT 16 2002

Joseph A. Legare  
Assistant Manager for Environment & Stewardship  
United States Department of Energy  
Rocky Flats Field Office  
10808 Highway 93, Unit A  
Golden, Colorado 80403-8200

RE: Flume Placement in Woman Creek

Dear Mr. Legare:

This letter is in response to your biological evaluation and addendum for the relocation of a flume in lower Walnut Creek to a temporary location in Woman Creek. The location for the flume in Woman Creek is south of the South Interceptor Ditch, downstream from the original landfill, and west of the confluence with Antelope Creek.

The Fish and Wildlife Service has reviewed the submitted project proposal and addendum, visited the flume removal location on Walnut Creek and the relocation site on Woman Creek, and conferred with the Senior Ecologist at Rocky Flats. As to your request for informal consultation, the Service concurs with your determination that the proposed project is not likely to adversely affect the Preble's meadow jumping mouse (*Zapus leucurus preblei*) or the proposed critical habitat for the mouse (67 Federal Register [137] 47154-47210). As always, prudence should be exercised in any activity conducted within the Preble's designated critical habitat. Vehicles should use established roads wherever possible. Where off-road travel is necessary, the smallest area accommodating the minimum necessary equipment should be used. Work should be performed when the ground is solid and can support the weight of equipment without creating ruts or destruction of vegetation cover.

Due to the paucity of information concerning the ecology and natural history of the Preble's mouse (PMJM), the precise effect of structures within the recognized habitat on movement patterns, range size, and population density is not clear. Studies conducted on the Rocky Flats Environmental Technology Site (RFETS) (K-H, 1998, 1999, 2000) demonstrated fluctuations of PMJM population distribution from year to year, suggesting the animals' ability to relocate over

Post-Net\* Fax Note 7671

To	Case	3
CO/Dept	Phone	7578
Phone #	Co	7578
Fax #	Phone #	7578
	Fax #	7578

Handwritten: W. H. 10/16/02, C. P. F. W. A. H.

distances in suitable habitat. These same studies showed a reverse correlation in the number of obstructions (in the form of dams and flumes) and the amount and continuity of suitable habitat to the range size and the maximum distance an individual traveled. Although not conclusive, the observations indicate the need to monitor the effects of changes produced by human-made structures in the designated PMJM habitat. The routine seasonal monitoring of PMJM populations that is conducted at the RFETS, with attention paid to new and removed obstructions, could offer valuable ecological information leading to the enhancement of Preble's populations.

In light of the numerous cleanup projects that will be conducted in the Woman Creek area below the South Interceptor Ditch, cumulative effects of addition disturbances to the area will be considered in future evaluations by the Service.

If the Service can be of assistance, please contact Beth Dickerson at (303) 966-5436 or (303) 289-0995.

Sincerely,

  
FOR LeRoy Carlson  
Colorado Field Supervisor

pc: DOE, Rocky Flats, Cliff Franklin  
FWS, Rocky Mountain Arsenal, Dean Rundle  
FWS, ES Field Office, Ari Corman  
FWS, Rocky Mountain Arsenal, Beth Dickerson

**REFERENCES**

K-H. 1998. Preble's meadow jumping mouse study at Rocky Flats Environmental Technology Site. In: Annual Wildlife Report 1998. Kaiser-Hill Company, Rocky Flats Environmental Technology Site, Golden, Colorado. May.

K-H. 1999. Preble's meadow jumping mouse study at Rocky Flats Environmental Technology Site. In: Annual Wildlife Report 1999. Kaiser-Hill Company, Rocky Flats Environmental Technology Site, Golden, Colorado. June.

K-H. 2000. Preble's meadow jumping mouse study at Rocky Flats Environmental Technology Site. In: Annual Wildlife Report 2000. Kaiser-Hill Company, Rocky Flats Environmental Technology Site, Golden, Colorado. June.

**Buffer Zone Concrete Removal Project**  
**Biological Evaluation Rev. 1**

The Rocky Flats Environmental Technology Site (Site), a U.S. Department of Energy (DOE) facility located between Boulder and Golden in Colorado, is currently a Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) site. During the 1950's an incinerator was located south of the current T130 trailer complex at the base of the northern slope in Woman Creek at the Site. It was used to incinerate trash and was operated until the late 1960's. After the incinerator was removed, the area was used for cleaning concrete trucks of excess concrete that was being used for construction of many of the buildings in the Industrial Area (IA). As a result, two large areas of concrete flows are present on the hillsides north of Woman Creek, one of which covers the old incinerator location. Due to some uncertainty surrounding what was actually burned in the incinerator, some radiological sampling of the concrete pieces will be conducted prior to removal of the concrete pieces from the area. In addition, several other piles of concrete are present in the area as well. As part of the Site cleanup and closure, the flows and other concrete in the area will be removed.

A Site visit of the project area was conducted with the USFWS on April 4, 2003 to evaluate the project and discuss how the project could move forward. Based on discussions during that visit it was decided that work could be conducted within the proposed critical habitat areas at any time, however, work within the current Preble's protection areas would have to wait for a letter of concurrence from the USFWS (Figure 1). A small portion of one of the existing roads needed for access to some locations of the project lies within the current Preble's protection area. Before the project can move forward, road improvements (general grading and flattening of the bumps and depressions) will be necessary in order for the vehicles to access the project area. On April 7, the USFWS agreed that improving the portion of the already existing road that lies within current Preble's protection area could be accomplished prior to receiving written approval from the USFWS for other activities taking place within the current Preble's protection areas. The USFWS requested that a written biological evaluation be prepared outlining the project specifics and goals, identifying the impacts to the Preble's mouse, and proposing mitigation for the disturbances. This document serves that purpose.

Figure 1 shows the location of the concrete flows and the proposed construction area needed for removal of the concrete. The cement flows are generally located in the proposed critical habitat, however, portions of the lower flows and a short section of the lower access road are located in the current Preble's protection area at the Site. The total project area will encompass about 3.55 acres. This acreage includes 2.19 acres in proposed critical habitat, and about 0.25 acres in current Preble's protection area that will be potentially disturbed during the project. Of the acreages in the Preble's habitat, the area of the existing roads and concrete flows have not been subtracted out. So not all of the acreage within the project boundaries is actual Preble's habitat. Not all areas within the construction area will be disturbed but these acreages encompass the entire area delineated on the map. The concrete flows to be removed encompass a total of about 1.45 acres in the entire project area. The vegetation at each of the locations is mostly mesic mixed grassland. The dominant native species on the grasslands include, western wheatgrass (*Agropyron smithii*), blue grama grass (*Bouteloua gracilis*), green needle grass (*Stipa viridula*), side-oats grama (*Bouteloua curtipendula*), and occasionally some buffalo grass (*Buchloe dactyloides*). Near the top of the pediment the grassland community is classified as xeric tallgrass prairie. At these locations the dominant plant species include big bluestem (*Andropogon gerardii*), little bluestem (*Andropogon scoparius*), mountain muhly (*Muhlenbergia montana*), Canada bluegrass (*Poa compressa*), and purple three-awn (*Aristida purpurea* ssp. *robusta*). There are also a few large plains cottonwood trees (*Populus deltoides*) on the hillside in the vicinity of the concrete flows, but these should not have to be disturbed during the project.

Project plans call for accessing the area from the west on an existing road that goes through the project area. Some road blading and improvement will be necessary to allow access for the large trucks and heavy equipment needed to do the work. Road improvements will involve moving existing road base (i.e. dirt) from one part of the road to another. They plan to scrap off the top few inches of material on the road to smooth out the road surface and let this material and the road surface dry out. As they need to fix the road they will push the dry dirt back over the road areas to smooth them out as needed. No importation of additional road base material is expected. Additionally, some draining of one or two locations of the road

will be needed to eliminate the muddy conditions present at those locations. The primary location where this would be conducted is on the road south of the southern patch of cottonwood trees (Figure 2). Drainage of the road will be accomplished by creating some small drainage channels on the downslope side of the road using shovels or the tines on the bucket of a backhoe or frontend loader. If the heavy equipment is used, the tines on the bucket will be used to create some scratches in the soil to drain the area. The tines are perhaps 8-12 inches in length and 2-3 inches wide, so the drainage channel areas would be about that size and perhaps 3 - 6 feet or so long if needed. It would all be contained within the area where silt fence was put up along the southern side of the road area.

Removal of the concrete will be accomplished using a large backhoe, trackhoe, or frontend loader piece of heavy equipment. The concrete will be broken and picked up, and either put into dump trucks for removal to the IA or placed in rolloff containers for removal. Water will be sprayed on the excavation work during excavation and removal activities for dust and particulate suppression. A water truck will be used to provide water to the work location. When working on the north concrete flow, the water truck will be positioned on the top of the pediment (outside of the current Preble's protection area and proposed critical habitat) to spray water down on the excavation work. Prior to removal from the project area, however, the underside of the concrete slabs will be tested for radiological contamination. Concrete slabs will be turned over in place or nearby within the project boundary for testing. After they have been cleared for removal they will be placed in the dump trucks or rolloff containers. At the large northern concrete flow on the hillside (#1 on Figure 1) removal will proceed from the bottom of the slope to the top of the hill. To access the base of the northern flow, an access road will be created from the main road coming from the west to the base of the flow and then circling around back to the west avoiding the large cottonwood trees (Figure 2). Note that on Figure 2 although one of the potential roads appears to go through a cottonwood patch, it is actually just beneath the overhanging canopy. At the large southern flow (#2 on Figure 1), the heavy equipment will drive on the flow itself and remove it from the bottom of the flow to the top. Driving on and staying on the concrete flow will eliminate the need for any additional disturbance beyond the lower edge of the flow. This is especially important at the large lower flow because a portion of the flow is located in the current Preble's protection area and it is necessary to minimize disturbance as much as possible in this area. Until final approval is received from the USFWS only a portion of the southern large flow can be removed. A painted line delineates the current Preble's protection area (the point beyond which no work can occur until approval is received). An additional small concrete flow is located on top of the pediment (# 3 on Figure 1). A small portion of the southern edge of this concrete flow located is located within proposed critical habitat. This area will be accessed from the top of the pediment, therefore minimizing disturbance to the proposed critical habitat.

Preliminary radiological sampling have shown no problems that would delay the project. Discussions with the project manager (Nick Demos) have indicated that they don't foresee any radiological issues that would require addition time or excavation beyond the current designated project boundaries. If for some reason something would come up that would require going beyond the project description or project boundaries as described in this BE, the USFWS will be consulted.

All work will be conducted within the general construction footprint area (exception being the grading of the existing road coming from the west to the project area). Work will begin in areas outside the current Preble's protection area. The current schedule for the project has completion taking approximately three to four weeks from the time it starts, assuming final approval for work within the current Preble's protection areas is received from the USFWS. It is also dependent on weather conditions and no equipment problems. Current plans are to begin in early April 2003. Should approval for work within the current Preble's protection areas be received early in the project, work on the large southern flow will be conducted as early as possible so that disturbance and noise at this location will be completed with minimal impacts to the Preble's mice as they begin to come out of hibernation.

Best management practices will be used to minimize disturbance to the area and to protect Preble's habitat. Best management practices include:

- using only established roads for vehicle traffic, when feasible,
- conducting activities, as feasible, when the Preble's mouse is inactive (i.e. during the day, hibernation period),

- post-construction clean-up of the activity location, removing trash and equipment,
- reducing the impact footprint (i.e., no excessive walking or driving in areas beyond what is necessary to accomplish the work, minimizing laydown area and equipment storage locations),
- minimizing the length of time spent within sensitive areas as much as feasible,
- avoiding wet areas and waiting for "dry" conditions to avoid damage to the habitat,
- using erosion controls (i.e., silt fence, hay bales, mulching, tackifiers, surface roughening) to prevent erosion and sedimentation problems,
- revegetating the disturbances using native plant species.

Silt fence will be placed along the entire bottom edge of the project area to delineate the boundary of the construction area and to prevent siltation and sedimentation in the Preble's habitat due to runoff from the project area.

After the concrete removal is completed, final regrading of the area will be done to reestablish the natural grades and the area will be revegetated with native plant species. Regrading will consist primarily of smoothing out any dirt piles or filling in any depressions in the project area where disturbances were made. No large scale scraping of the project area in undisturbed areas will be done. The goal will be to minimize disturbance to vegetated areas, even within the project boundaries. After project completion silt fencing will remain in place to prevent erosion. On the steep north concrete flow area, natural fiber mattes or other similar type erosion controls will be used to prevent erosion. On the less steep areas, hydromulch or crimped native hay or straw will be used to assist in erosion control. Revegetation monitoring will be conducted following the protocols listed in the Programmatic Biological Assessment (PBA) currently under development with the USFWS (DOE 2003).

Analysis of potential impacts to the Preble's mouse suggest that although the project may affect the mouse and its habitat, it is unlikely that there will be any adverse affects. The following reasons are provided. The concrete flows themselves and most of the current roads that access the area are not considered mouse habitat under the proposed critical habitat ruling (67 FR 137: 47153-47120). Therefore removal and revegetation of the concrete flows will actually increase the amount of habitat available to the Preble's mouse (1.45 acres). To remove the large southern flow (#2), a portion of which is in the current Preble's protection area, the heavy equipment will drive on the flow area itself and not disturb any habitat closer to the stream than the lower edge of the flow itself. Most of the project is located solely within proposed critical habitat (62 percent of the total project area). Therefore it is located more than 100 feet from the edge of the riparian shrubland/woodland habitat which is largely mesic mixed grassland, lower quality habitat than the riparian shrubland/woodland found along the stream. The road of which a portion is located within the current Preble's mouse protection area is an active road that does not provide good habitat to the Preble's mouse. Therefore road improvement in this area should have no adverse impact on the mouse. Telemetry studies at the Site have indicated that due to the restricted, narrow riparian corridors at the Site, the Preble's mice tend to stay close to these areas, rarely venturing more than 100 feet from the stream edge (K-H 1999, 2000, 2001, 2002). Additionally, other studies that evaluated the Preble's mouse in close proximity to ongoing projects at the Site have shown that as long as suitable habitat was available adjacent to the project area, the mice did not venture far from the project area and did not appear to be bothered by the noise and heavy equipment activity (DOE 1996, K-H 2000). Therefore since the riparian corridor itself is not being disturbed, and abundant high quality habitat occurs adjacent to the project area no adverse affect to the mouse is expected. The Preble's mouse will be able to continue to exist and have its biological and ecological requirements met during the project activities and revegetation timeframes.

From the perspective of additive or cumulative impacts, several other future cleanup projects are planned for the Woman Creek drainage and are being addressed in a PBA currently being written for the Site, in consultation with the USFWS. Timing of projects has been a particular concern because it is possible that many of these projects will occur simultaneously in order to complete Site closure on schedule. Allowing this project, which was included in the PBA (but will now be referenced in the PBA), to be completed at this time, will help alleviate some of the scheduling concerns. This project will be completed and in revegetative recovery when most of the other projects discussed in the PBA begin.

## References

DOE. 1996. Study Results of Dam Toe Slope Sand/Rock Blanket Installation Effects on the Preble's Meadow Jumping Mouse. Rocky Flats Field Office, U.S. Department of Energy, Golden, CO. January 29, 1996.

DOE. 2003. Programmatic Biological Assessment for Department of Energy Activities at the Rocky Flats Environmental Technology Site. Rocky Flats Field Office, U.S. Department of Energy, Golden, CO. (Currently under development – Spring 2003).

K-H. 1999. 1998 Annual Wildlife Survey Report for the Rocky Flats Environmental Technology Site. Kaiser-Hill Company, LLC. Rocky Flats Environmental Technology Site, Golden, CO. June 1, 1999.

K-H. 2000. 1999 Annual Wildlife Survey Report for the Rocky Flats Environmental Technology Site. Kaiser-Hill Company, LLC. Rocky Flats Environmental Technology Site, Golden, CO. June 2000.

K-H. 2001. 2000 Annual Wildlife Monitoring Report for the Rocky Flats Environmental Technology Site. Kaiser-Hill Company, LLC. Rocky Flats Environmental Technology Site, Golden, CO. June 2001.

K-H. 2002. 2001 Annual Wildlife Report for the Rocky Flats Environmental Technology Site. Kaiser-Hill Company, LLC. Rocky Flats Environmental Technology Site, Golden, CO. August 2002.



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# Buffer Zone Concrete Removal Project - Construction Roads

## Figure 2 Legend

-  Current Preble's Protection Area
-  Proposed Critical Habitat
-  Project Boundary

### Standard Features

-  Buildings
-  Demolished Buildings
-  Lakes & ponds
-  Streams & ditches
-  Fences
-  Paved roads
-  Dirt roads

**DATA SOURCE BASE FEATURES:**  
Buildings, fences, hydrography, roads and other structures from 1994 aerial imagery data captured by ED&S RSL, Las Vegas. Digitized from the orthophotographs, 1/85.

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Additional roads for construction activities.



1:1209



State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD27

U.S. Department of Energy  
Rocky Flats Environmental Technology Site

Prepared by **LABAT** For **Kaiser-Hill Company, LLC**

RFETS GIS Dept. 303-866-7707

MAP ID: 03-0013

April 7, 2003

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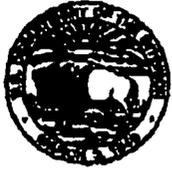
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## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Ecological Services  
Colorado Field Office  
755 Parfet Street, Suite 361  
Lakewood, Colorado 80215

IN REPLY REFER TO:  
ES/CO: BZ Concrete Flow  
Mail Stop 65412

APR 28 2003

Cliff Franklin  
Team Lead for Infrastructure and Stewardship  
Department of Energy  
Rocky Flats Field Office  
10808 Highway 93, Unit A  
Golden, Colorado 80403-8200

Re: Buffer Zone Concrete Removal Project

Dear Mr. Franklin:

We have received your letter of April 15, 2003, regarding the Buffer Zone Concrete Removal Project. Based on the project description and location, the Fish and Wildlife Service concurs that your project is not likely to adversely affect the Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*) or the proposed critical habitat for the mouse. Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

Please contact the Service to discuss any changes in the project or site conditions. If the Service can be of further assistance, please contact Beth Dickerson at (303) 966-6436.

Sincerely,

A handwritten signature in black ink, appearing to read "LeRoy W. Carlson".

LeRoy W. Carlson  
Colorado Field Supervisor

cc: Dean Rundle, FWS, Rocky Mountain Arsenal  
Beth Dickerson, FWS, Rocky Mountain Arsenal

**BIOLOGICAL EVALUATION**  
**EAST TRENCHES PLUME TREATMENT SYSTEM MAINTENANCE**  
**September 19, 2003**  
**Rev. 1**

The East Trenches Plume Treatment System (ETPTS) was installed in 1999 along the south side of the B-series ponds at the Rocky Flats Environmental Technology Site. The ETPTS was installed to collect and treat contaminated groundwater before it reached South Walnut Creek. The primary contaminants of concern are carbon tetrachloride, trichloroethene and tetrachloroethene. The ETPTS was required to meet cleanup criteria, and a specific milestone outlined in the Rocky Flats Cleanup Agreement. Much of the ETPTS is located in the habitat of the Preble's meadow jumping mouse (Preble's mouse; *Zapus hudsonius preblei*), a federally listed threatened species under the Endangered Species Act of 1973, as amended (ESA).

The ETPTS consists of a 1,100 foot long collection trench installed south of the B-series ponds (B-1, B-2, and B-3) and two treatment cells installed on the east end of the system. Figure 1 shows the location of the project area along South Walnut Creek. The ETPTS treats the contaminated groundwater by passing it through iron filings in the treatment cells. Every few years the iron filings (treatment material) must be replaced as the old filings become plugged and no longer function to meet the treatment objectives. Recent evaluations of the treatment cells have revealed that the iron filings need replacement as soon as possible so that the ETPTS will function properly and meet regulatory water standards. The treatment cells are currently plugged and not meeting the treatment objectives.

All project activities will take place within the project footprint or on existing roads. The project boundaries are being located as far from the stream and pond edge to minimize impacts to the Preble's mouse habitat, yet allow the project the room it needs to complete the work. The project work area will temporarily disturb (i.e., trampling, small area of excavation) approximately 0.09 acres of Preble's habitat. The pre-existing road and access areas for the treatment cells consists of 0.06 acres within Preble's habitat. This is not considered Preble's habitat. No permanent loss of habitat will occur as a result of the project. Silt fence will be installed around the edge of the work area on the west, north, and east sides to delineate the project area and to prevent erosion. The habitat in the area is of low quality since the project area was part of the original work area for the ETPTS project when it was installed in 1999. Currently it is vegetated with weedy forbs such as Canada thistle (*Cirsium arvense*), diffuse knapweed (*Centaurea diffusa*), yellow sweet clover (*Melilotus officinale*), and annual sunflower (*Helianthus annuus*), with an understory of native species that were seeded in the area in 1999 (blue grama [*Bouteloua gracilis*], side-oats grama [*Bouteloua curtipendula*], western wheatgrass [*Agropyron smithii*], and buffalo grass [*Buchloe dactyloides*]).

The treatment cells consist of two large underground circular containment structures that are filled with several feet of iron filings, sand, and gravel. Each treatment cell is approximately 13 feet high and 13 feet in diameter. The removal and replacement of the iron filings, sand, and gravel, is a large undertaking because the treatment material has become solidified and is not easily broken up for removal. Prior to removal of the treatment material, the collection system will be turned off and the water in the treatment cells pumped back to the collection sump located to the west of the treatment cell area. It will be pumped via a 3-4 inch hose laid across the grassland. The hose will be laid as far from the stream and pond as possible to stay away from the habitat. Pumping will take place each day to move the water out of the treatment cells during work operations and to cover the material remaining at the end of each day. Removal of

the treatment material will involve breaking up the material inside the treatment cells using a backhoe and/or perhaps jack hammers. The broken up treatment material will then be removed from the treatment cells using a truck mounted vacuum system. Once in the vacuum system the material will be transported to the parking area near the old PACs Three area for storage until sampling results determine the appropriate disposal method. But they will be stored outside of Preble's habitat.

Due to the limited access to the treatment cells, some excavation along the hillside on the south side of the treatment cells will be necessary to level off an area so the vacuum truck can safely reach the treatment cells and pull out the treatment material. The excavation will be approximately 10-15 feet wide (enough to allow the truck safe access to the area). The edge of the hillside area will be tapered to meet safety requirements and to match the surrounding area in terms of slope. This excavated area will be left in place for future maintenance on the treatment cells. The excavated soil will be stockpiled within the project footprint and spread out over the disturbed areas after the project is complete. Approximately 90 pallets of new iron filings will be required to replenish the treatment cells. The storage of these pallets will be either on nearby road surfaces or in the IA outside of Preble's habitat. The pallets of new iron fillings will be brought to the project area by truck and unloaded with a forklift for replenishing the treatment cells. Pea gravel will be brought in to add to the treatment cells according to the project specifications. This material will be staged within the project footprint. At the end of each working day, the tops of the treatment cell tanks will be closed or covered to prevent any wildlife from falling into the cells. The project is slated to begin in late September/early October, 2003 and should take approximately 3 weeks to complete.

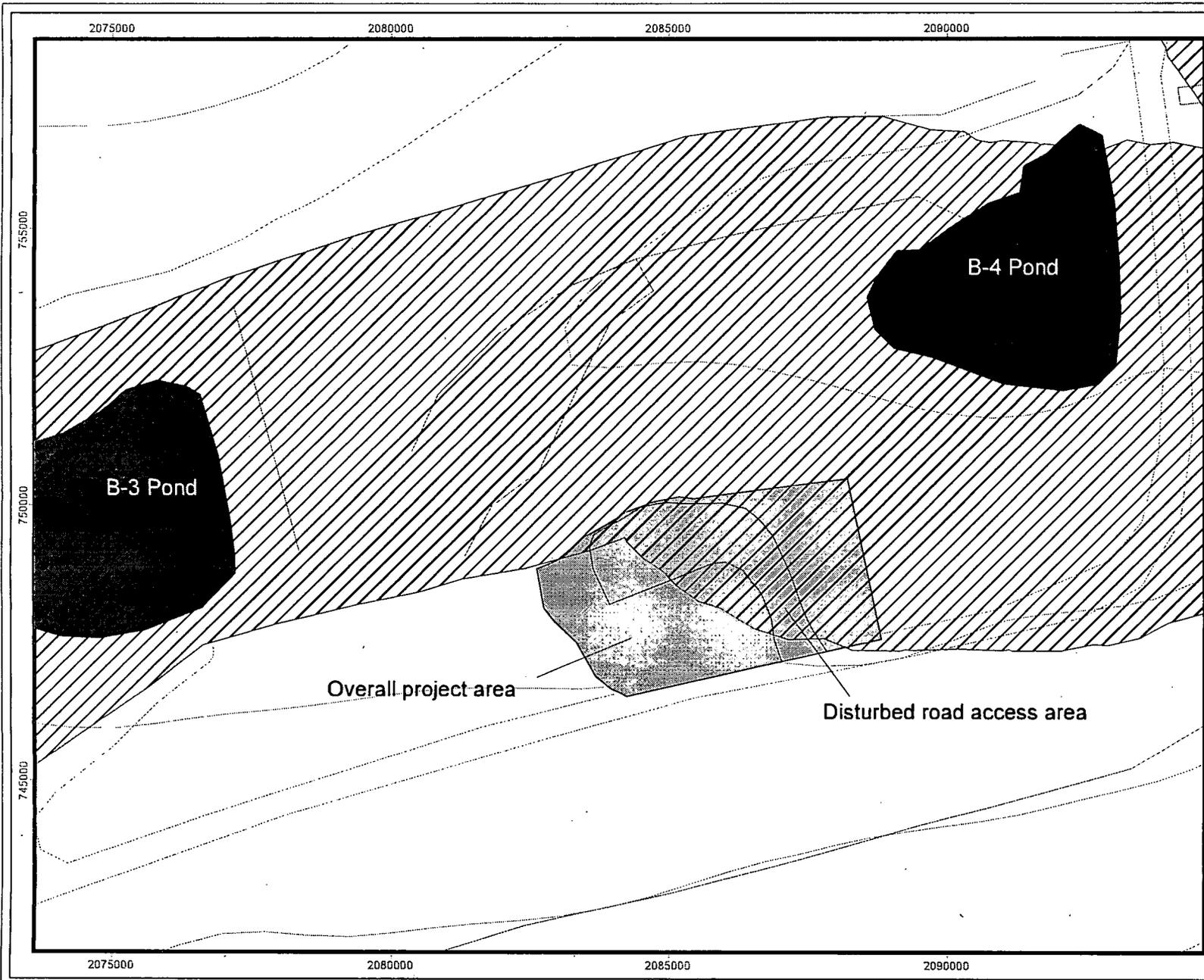
After the project is complete, the area will be reseeded with native graminoid species such as western wheatgrass, blue grama, side-oats grama, green needle grass (*Stipa viridula*), buffalo grass, and slender wheatgrass (*Agropyron trachypleura* [A. caninum = Site nomenclature]). The area will be hydromulched after seeding and silt fences will be maintained to prevent erosion and sedimentation from the project area.

Because the maintenance of the ETPTS must be conducted, it is not possible to avoid impacts to the Preble's mouse. However, several things will be done to minimize the impacts:

- Since avoidance is not possible, the project footprint has been minimized to keep it as small as possible, yet allow the work to proceed.
- No permanent loss of Preble's habitat will occur.
- The project will impact a very small area of Preble's habitat (0.09 acres).
- Several hundred feet of high quality Preble's habitat exist upstream and downstream from the project location, so there is an abundance of accessible, suitable habitat for the mice to utilize.
- Project timing coincides with the beginning of the hibernation period of the Preble's mouse. So the mice are not likely to be active during the project.
- Any excavation will be kept to a minimum necessary for safe access to the treatment cells. Thus potential impacts to the mouse are minimized.
- The remainder of the disturbance to the project footprint will be trampling (temporary impacts).
- The project area has been kept out of areas with woody vegetation (higher quality Preble's habitat) and kept within previously disturbed low quality grassland areas.

- Because currently the area is of low habitat value (predominantly weeds), the revegetation with native species will provide habitat of higher quality.
- Noxious weed control will be conducted within the revegetated project area to help the native species establish.
- Work activities will be conducted during daylight hours.

In conclusion, the work cannot be avoided and must be conducted so that the ETPTS can function properly and meet regulatory water standards. Through minimization of the project footprints and the fact that the work will largely be occurring during the hibernation period of the mouse, although the project may affect the Preble's mouse, no adverse affects are expected and the Site requests approval to conduct the project as soon as possible.



# Rocky Flats Environmental Technology Site

Figure 1

-  Disturbed road access area
-  Overall project area

### Standard Features

-  Buildings
-  Demolished Buildings
-  Lakes & ponds
-  Streams & ditches
-  Fences
-  Paved roads
-  Dirt roads
-  Contours (20 ft. intervals)

**DATA SOURCE BASE FEATURES:**  
 Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by ED&D R.E.L. Las Vegas. Digitized from the orthophotograph, 1985.

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1:547



State Plane Coordinate Projection  
 Colorado Central Zone  
 Datum: NAD27

U.S. Department of Energy  
 Rocky Flats Environmental Technology Site

Prepared by: **LABAT** For: **Kaiser-Hill Company, LLC**

RFETs GIS Dept. 303-866-7707

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# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Ecological Services  
Colorado Field Office  
755 Parfet Street, Suite 361  
Lakewood, Colorado 80215

03 OCT 17 AM 7:57  
GCDM

IN REPLY REFER TO:  
BS/CO: Rocky Flats/  
Mail Stop 65412 Lakewood

October 6, 2003

Cliff Franklin  
Team Lead for Infrastructure and Stewardship  
United States Department of Energy  
Rocky Flats Field Office  
10808 Highway 93, Unit A  
Golden, Colorado 80403-8200

RE: East Trenches Plume Treatment System Maintenance Project in the Current Protection Area

Dear Mr. Franklin:

We have received your letter of September 22, 2003, regarding the East Trenches Plume Treatment System Maintenance Project. Based on the project description, location, and information obtained during the site visit, the U.S. Fish and Wildlife Service concurs that although the maintenance project will disturb a small amount of low quality habitat, the project is not likely to adversely affect the Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*). Please note that this clearance is valid for one year from the date of this letter. Should project plans change, or if additional information regarding listed or proposed species becomes available, this determination may be reconsidered. If the proposed project has not commenced within one year, please contact the Service to request an extension.

If the Service can be of further assistance, contact Amy Thornburg at (303) 966-3638.

Sincerely,

*Susan C. Linner*  
Susan C. Linner  
Colorado Field Supervisor

pc: FWS-Rocky Flats (D. Rundle, A. Thornburg)  
FWS-CFO (P. Plage)

Post-It Fax Note 7671		Date	# of pages 1
To <i>A. Rosenman</i>	From <i>C. Franklin</i>	Co.	
Co./Dept.	Phone #	Fax #	
Phone #			
Fax # <i>8452</i>			

5476

## **Appendix D: Federal and State Permits**



DEPARTMENT OF THE INTERIOR  
U.S. FISH AND WILDLIFE SERVICE

3-201  
(1/97)

# FEDERAL FISH AND WILDLIFE PERMIT

**1. PERMITTEE**

KAISER-HILL COMPANY, LLC  
ROCKY FLATS ENVIRONMENTAL TECH. SITE  
ATTN: DAVID C. SHELTON, VP ENVIRONMENTAL  
10808 HIGHWAY 93, UNIT B, BLDG. 115  
GOLDEN, CO 80403-8200  
U.S.A.

**2. AUTHORITY-STATUTES**  
16 USC 1531(A)

REGULATIONS (Attached)  
50 CFR 17.32

**3. NUMBER**  
TE051719-0

**4. RENEWABLE**  
 YES  
 NO

**5. MAY COPY**  
 YES  
 NO

**6. EFFECTIVE**  
03/25/2002

**7. EXPIRES**  
12/31/2006

**8. NAME AND TITLE OF PRINCIPAL OFFICER (If #1 is a business)**  
DAVID C. SHELTON  
VICE PRESIDENT ENVIRONMENTAL SYSTEMS

**9. TYPE OF PERMIT**  
THREATENED SPECIES

**10. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED**  
ON LANDS SPECIFIED WITHIN THE ATTACHED SPECIAL TERMS AND CONDITIONS

**11. CONDITIONS AND AUTHORIZATIONS:**

- A. GENERAL CONDITIONS SET OUT IN SUBPART D OF 50 CFR 13, AND SPECIFIC CONDITIONS CONTAINED IN FEDERAL REGULATIONS CITED IN BLOCK #2 ABOVE, ARE HEREBY MADE A PART OF THIS PERMIT. ALL ACTIVITIES AUTHORIZED HEREIN MUST BE CARRIED OUT IN ACCORD WITH AND FOR THE PURPOSES DESCRIBED IN THE APPLICATION SUBMITTED. CONTINUED VALIDITY, OR RENEWAL, OF THIS PERMIT IS SUBJECT TO COMPLETE AND TIMELY COMPLIANCE WITH ALL APPLICABLE CONDITIONS, INCLUDING THE FILING OF ALL REQUIRED INFORMATION AND REPORTS.
- B. THE VALIDITY OF THIS PERMIT IS ALSO CONDITIONED UPON STRICT OBSERVANCE OF ALL APPLICABLE FOREIGN, STATE, LOCAL OR OTHER FEDERAL LAW.
- C. VALID FOR USE BY PERMITTEE NAMED ABOVE.
- D. Further conditions of authorization are contained in the attached Special Terms and Conditions.

ADDITIONAL CONDITIONS AND AUTHORIZATIONS ALSO APPLY

**12. REPORTING REQUIREMENTS**  
ANNUAL REPORT DUE: 12/31

ISSUED BY

TITLE  
ARD - ECOLOGICAL SERVICES

DATE  
03/25/2002



STATE OF COLORADO  
 DEPARTMENT OF NATURAL RESOURCES  
 DIVISION OF WILDLIFE  
 SCIENTIFIC COLLECTION LICENSE



Date of Issue: 2/25/2003

State License Number: 03-TR569

Fee: \$20.00

Federal License Number: TE051719-0

This certifies that: SHELTON, DAVID C.  
 Of: KAISER-HILL COMPANY, LLC  
 Address: 10808 HWY 93, UNIT B, BLDG 115  
 City/State/Zip: GOLDEN, CO 80403-8200

Subpermittees: ANY PERSON(S) UNDER THE DIRECT CONTROL OF OR EMPLOYED BY THE PERMITTEE ONLY TO THE EXTENT NECESSARY IN ACCOMPLISHING THE PURPOSE AUTHORIZED

Is authorized to collect the following species of wildlife:

**BASILINE SURVEY TO DETERMINE PRESENCE/ABSENCE OF PREBLE'S MEADOW JUMPING MOUSE. SALVAGE AUTHORIZED FOR INADVERTENT KILLS AS FEDERALLY PERMITTED. ALL MAMMALS CAPTURED MUST BE IMMEDIATELY RELEASED AT SITE OF CAPTURE FOLLOWING IDENTIFICATION AND MARKING.**



Manner of collecting:  
 LIVE TRAP/RELEASE

Location(s) by County:  
 JEFFERSON AND BOULDER COUNTIES WITHIN THE ROCKY FLATS SITE

**STANDARD LIMITATIONS.** All collections of wildlife under authority of this license must be in accordance with all statutes and regulations applying to a licensed hunter, trapper or fisherman taking wildlife except for exceptions specifically identified in the terms of this license. The Division of Wildlife Office nearest to the collecting vicinity(ies) **MUST BE NOTIFIED** before any collecting, banding or salvage activities are performed by the licensee (see attached manual of offices). If any wildlife is procured hereunder for reasons other than scientific collection this license becomes void. Any wildlife collected under terms of this license may not in whole or in part be used for consumptive purposes, or for sale for any reason. **NO STATE OR FEDERAL THREATENED OR ENDANGERED SPECIES MAY BE COLLECTED WITHOUT SPECIFIC AUTHORIZATION. A FEDERAL PERMIT IS ADDITIONALLY REQUIRED FOR ALL FEDERALLY PROTECTED SPECIES.** This permit is invalid without such federal permit(s). Year-end reports of all collecting activities are due within thirty (30) days of the expiration of this license.

Additional limitation(s), if applicable:

**PREBLE'S MEADOW JUMPING MOUSE PROTOCOL:** No transportation, captivity, or overnight holding of specimens. Follow the current version of the FWS guidelines for PJM trapping. Current guidelines may be found on the internet at: <http://www.ro.fws.gov/preble/pmj1999.htm> Capture: Notify the DOW within 1 working day of any PJM capture. Mortality: Notify the DOW within 1 working day of any trapping mortality and immediately freeze the specimen pending further instructions. Genetics samples: CHECK WITH GARY SKIBA 303-291-7466; DOW PRIOR TO INITIATION OF TRAPPING for additional information on samples needed for genetics work. Successful AND unsuccessful trap locations for PJM must be reported in UTM's. Captured non-target species must be released at site of capture unharmed. Traps must be sterilized between survey sites to minimize disease transfer.

By:   
 Kathy Konishi, License Administrator, Special Licensing Unit

Expiration Date: 12/31/2003

ORIGINAL - Licensee

COPY - File

210  
 210