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

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TAILS: 65412-2008-F-0477

SEP 5 2008

Scott Surovchak, LM Site Manager
Department of Energy, Office of Legacy Management
11025 Dover Street, Suite 1000
Westminster, Colorado 80021

Dear Mr. Surovchak:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion on the installation of a sump at the Solar Ponds Passive Treatment System at Rocky Flats, Jefferson County, Colorado, and its effects on the federally-threatened Preble's meadow jumping mouse (*Zapus hudsonius preblei*) (Preble's). This biological opinion is provided in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). It is based on the document "Programmatic Biological Assessment Amendment for Solar ponds Passive Treatment System Phase I Upgraded at the Rocky Flats, Colorado, Site, July 2008" (biological assessment) as well as subsequent emails and phone conversations to further refine the project description. Your request for formal consultation, was received by the Service on July 14, 2008. This biological opinion addresses work to install a sump at the Solar Ponds Passive Treatment System. We concur with your conclusion that the proposed work is likely to adversely affect Preble's.

CONSULTATION HISTORY

On May 13, 1998, Preble's was listed as threatened under the Endangered Species Act. Full protection for Preble's became effective on June 12, 1998. On June 23, 2003, critical habitat for Preble's was designated. Trapping surveys have documented Preble's along drainages at the Rocky Flats Site including Rock Creek, North Walnut Creek, South Walnut Creek and Woman Creek.

DOE, Kaiser-Hill (K-H), and the Service began preliminary discussions about a Programmatic Biological Assessment (PBA) that would address the possible effects on Preble's from a number of site activities on June 4, 1998. Discussions about the benefits and the basic outline of contents for the PBA began on March 8, 1999. On July 12, 2000, the Service provided a letter of concurrence on a portion of the projects in the PBA- Part I containing projects with no effects, or

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projects that were not likely to adversely affect the Preble's mouse. The Service provided comments and requested information on the remaining projects provided by DOE in PBA-I where there was not concurrence. On August 1, 2002, the Service issued a biological opinion on the Water Measurement Flume Replacement Project (USFWS 2002) so that several deteriorated flumes could be replaced. Further discussion of the recommendations and non-concurrence activities was tabled until DOE reinitiated consultation on the PBA on January 16, 2003. Revisions to the PBA draft were discussed by Service personnel, DOE and K-H on February 11, 20, 21, 24, and 27, 2003. Additional PBA revisions and comments for PBA-I were discussed April 29, 2003, and PBA-II comments were provided by the Service June 18, 2003.

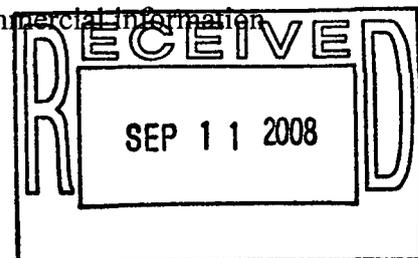
A revised draft PBA was provided by DOE and K-H in October, 2003, for review. On December 18, 2003, the Service received a draft of Part I of the PBA incorporating the previously requested information and revisions along with a letter requesting concurrence by DOE. Part I was submitted separately to expedite the approval process of the activities addressed there while consultation continued on Part II. Part I concurrence was established January 30, 2004. The biological opinion for Part II of the PBA was signed on April 5, 2004. The Solar Ponds Passive Treatment System Phase I Upgrades project (SPPTS) was not included in the PBA with other projects.

In March 2007, Service personnel visited the project area to discuss the SPPTS project activities. Verbal approval was given to conduct the initial potholing effort to determine the type and location of existing pipes. Consultation in the PBA had included a discussion for unforeseen disturbances (DOE 2004b, Section 3.11, "Unforeseen Projects Inside Current Preble's Protection Areas"). Disturbances were mapped and tracked in the Preble's mouse mitigation debit/credit spreadsheet for the Rocky Flats Site. The first potholing effort took place in May.

In May 2008, Service personnel again visited the SPPTS project location to discuss the need to pothole the area to locate two preexisting underground water lines that go between the sump and SPPTS. If the pipes could be found, tested for integrity, and determined to be usable, their use would eliminate the need for trenching 200-300 feet in Preble's mouse habitat to install new piping. Verbal approval was given to proceed with the potholing. Disturbances for this activity were also covered in the PBA (DOE 2004, Section 3.11, "Unforeseen Projects Inside Current Preble's Protection Areas"). Disturbances were mapped and tracked in the Preble's mouse mitigation debit/credit spreadsheet for the Rocky Flats Site. The 2008 potholing involved locating the lines and investigating by using a backhoe and utility locating equipment.

PREBLE'S BIOLOGICAL OPINION

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



DESCRIPTION OF THE PROPOSED ACTION

The Solar Ponds Passive Treatment System (SPPTS) was installed in 1999 and modified in 2002 to collect and treat groundwater contaminated with nitrate and low levels of uranium that had leaked from the former Solar Evaporation Ponds (SEPs) located upgradient (southwest) of the SPPTS. This groundwater contaminant plume is referred to as the Solar Ponds Plume (SPP). The SPPTS is part of the site remedy under the Corrective Action Decision/Record of Decision.

The SPPTS is composed of a groundwater collection trench, collection well, a solar-powered pump and associated electronics, treatment cells, and an effluent discharge line. The SPPTS intercept trench was, however, installed within the SPP, therefore, the trench does not intercept downgradient portions of the plume, allowing untreated, contaminated water present downgradient of the trench to enter North Walnut Creek. To improve contaminant removal from the groundwater, reduce loading to surface water, and improve surface water quality in North Walnut Creek, DOE plans to upgrade the SPPTS to capture and treat a portion of the contaminated groundwater that is currently not being captured and treated.

Upgrades to the SPPTS will be phased. Phase I will consist of installing a collection sump in the vicinity of the former Interceptor Trench Pumphouse (ITPH) at the bottom of the hill, in Preble's habitat. Water from the east and west lines of a series of preexisting French drains will be collected at the sump, where it will be transferred back up the hill to the SPPTS for treatment. After treatment the water will be transferred via a nonperforated pipe to the discharge gallery. During planning of the project, two potholing efforts were conducted to locate existing underground plumbing in the valley bottom. This information was necessary (1) to understand why the groundwater at the discharge gallery had consistently high levels of nitrate and uranium and (2) to locate existing pipes and test them for potential use in the final design. The preexisting pipes appear to be in suitable condition and location to reuse for the current project, and have been incorporated into the project plans.

Installation of the sump collection system will involve:

- Excavating the sump location,
- Installing a water collection trench (approximately 25 feet long on each side of the sump),
- Installing the sump collection system and solar panel power source,
- Installing the plumbing to connect to the existing underground pipe that will transfer water back up the hill to the SPPTS,
- Installing a metering vault adjacent to the SPPTS to support sampling and measurement of flow from the sump and flow into the SPPTS,
- Installing plumbing to connect the discharge water line from the SPPTS to the discharge gallery underground pipe, additional plumbing, valves, and monitoring equipment,

- Installing an overflow pipe from the collection sump that will be connected to a 5-foot square, 6-foot deep washed-rock deep wet well,
- Installing a storage vault in the lower parking area to house the discharge line and the batteries that are charged from the solar panels used to power the sump and other instruments in that area, and
- Installing wiring and the solar panel power sources.

Along the lower portion of the effluent line going to the discharge gallery, two four-inch diameter vertical cleanout pipes will also be installed.

At the upper pipe connection area, the new pipe connections that run between the western connection point of the preexisting underground pipes and the existing SPPTS will be buried underground. The solar panel power source for the instrument vault near the top of the hill will be located outside of Preble's habitat.

The construction footprint and locations of collection sump, solar panel power sources, instrument/battery storage vaults, and various piping components have been placed to minimize impacts to Preble's mouse habitat as much as possible while still allowing for safe work conditions, reuse of existing underground piping, and access needed to conduct the activities. The location of the sump has been placed just off the southwest corner of the disturbed parking/turnaround area at the bottom of the hill, adjacent to the former ITPH and its subsurface components. The location of the lower solar panel power source has been placed in the northwest corner of the turnaround area while the upper solar panel power source will be placed outside of habitat. The locations of the overflow pipe and wet well are in the lower parking area. Once installation is complete, the only visible aboveground components will be the tops of the sump, the instrument and battery storage vaults and the solar panel assembly. Each feature will be protected by bollards as necessary.

Phases II, III, and IV (if needed) may involve upgrading or replacing the existing SPPTS to handle the increased volume of water and associated contaminant load. Phase II of the SPPTS upgrade would focus on upgrading the uranium treatment; its design would be based on data gathered through Phase I. A similar process is planned for Phases III and IV, as data collected through Phase I and any subsequent phases will be used to design those upgrades. Phase III would focus on optimizing the nitrate treatment, and Phase IV would incorporate the findings from previous phases to modify the full-scale treatment system. Therefore, this consultation is for the Phase I activities only. Consultation on Phase II, III, and IV activities (if conducted in Preble's habitat) will be conducted separately.

Action Area

Our regulations define the action area to be all areas directly or indirectly affected by the Federal action, and not merely the immediate area involved in the action (50 CFR

402.02). We have determined that the action area of this consultation consists of only the immediate project area.

Conservation Measures

Provisions in the project description that the project proponent will implement to reduce impacts of the action or 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 biological assessment that will benefit Preble's include the following:

- Erosion controls will be installed prior to initiation of the project.
- Construction limits will be delineated with t-posts and rope or orange construction fencing.
- All disturbed areas will be revegetated following guidance on Appendix A of the PBA Part II.
- Post-project completion erosion controls will be installed according to guidance in the Erosion Control Plan.
- Disturbance footprints will be identified and tracked in the Preble's mitigation debit/credit tracking sheet.
- Mitigation for impacts from the upgrade project will consist of revegetation of project disturbances in situ; any additional needed mitigation will come from either DOE's State Land Board section 16 conservation easement, or from additional Preble's mouse habitat creation in the reconfigured drainages of the former Industrial Area at the site.

STATUS OF THE SPECIES

The Preble's meadow jumping mouse is a member of the family Dipodidae (jumping mice) with four living genera, two of which, *Zapus* and *Napaeozapus* are found in North America (Hall 1981). The three living species within the genus *Zapus* are *Z. hudsonius* (the meadow jumping mouse), *Z. princeps* (the western jumping mouse), and *Z. trinotatus* (the Pacific jumping mouse). Edward A. Preble (1899) first documented the meadow jumping mouse from Colorado. Krutzsch (1954) described Preble's as a separate subspecies of meadow jumping mouse limited to Colorado and Wyoming. Preble's is now recognized as one of twelve subspecies of meadow jumping mouse (Hafner *et al.* 1981).

The Preble's meadow jumping mouse is a small rodent with an extremely long tail, large hind feet and long hind legs. The tail is bicolored, lightly-furred and typically twice as long as the body. The large hind feet can be one-third again as large as those of other mice of similar size.

Preble's has a distinct, dark, broad stripe on its back that runs from head to tail and is bordered on either side by grey to orange-brown fur. The hair on the back of all jumping mice appears coarse compared to other mice. The underside hair is white and much finer in texture. Total length of adult Preble's mice is approximately 7 to 10 inches and tail length is 4 to 6 inches (Kruttsch 1954, Fitzgerald *et al.* 1994). The average weight of 120 adult Preble's mice captured early in their active season (prior to June 18) was 0.6 ounces; included were 10 pregnant females weighing more than 0.8 ounces (Meaney *et al.*, 2002).

The Service listed the Preble's meadow jumping mouse as a threatened species on May 13, 1998 (63 Federal Register 26517).

Life History

Habitat

Typical habitat for Preble's meadow jumping mouse is comprised of well-developed plains riparian vegetation with adjacent, relatively undisturbed grassland communities and a nearby water source. Well-developed plains riparian vegetation typically includes a dense combination of grasses, forbs, and shrubs; a taller shrub and tree canopy may be present (Bakeman 1997). When present, the shrub canopy is often willow, although other shrub species, including snowberry (*Symphoricarpos* spp.), chokecherry (*Prunus virginiana*), hawthorn (*Crataegus* spp.), Gambel's oak (*Quercus gambelli*), alder (*Alnus incana*), river birch (*Betula fontinalis*), skunkbrush (*Rhus trilobata*), wild plum (*Prunus americana*), lead plant (*Amorpha fruticosa*), dogwood (*Cornus sericea*) and others may also occur (Bakeman 1997, Shenk and Eussen 1998). Preble's have rarely been trapped in uplands adjacent to riparian areas (Dharman 2001). However, Preble's have been found feeding and resting in adjacent uplands (Shenk and Sivert 1999b, Schorr 2001) as far out as 328 feet beyond the 100-year floodplain (Ryon 1999, Tanya Shenk, Colorado Division of Wildlife, in litt., 2002). Preble's can also move considerable distances along streams, as far as 1 mile in one evening (Ryon 1999, Shenk and Sivert 1999a). Adjacent uplands used by the Preble's meadow jumping mouse are extremely variable ranging from open grasslands to ponderosa pine (*Pinus ponderosa*) woodlands (Corn *et al.* 1995, Pague and Gruneau 2000).

Riparian shrub cover, tree cover, and the amount of open water nearby are good predictors of Preble's densities (White and Shenk 2000). Estimates of abundance ranged from 6 to 110 mice per mile and averaged 53 mice per mile of stream. A comparison of habitats at capture locations on the Department of Energy's Rocky Flats Site in Jefferson County, Colorado, and the U.S. Air Force Academy in El Paso County, Colorado revealed that Academy sites had lower plant species richness at capture locations but considerably greater numbers of Preble's (Schorr 2001). However, the Academy sites also had higher densities of both grasses and shrubs. Preble's abundance is likely driven by the density of riparian vegetation rather than the diversity of plant species.

Preble's is a true hibernator, usually entering hibernation in September or October and emerging the following May, after a potential hibernation period of seven or eight months. Adults enter hibernation earliest because they accumulate the necessary fat stores sooner than young of the year. Similar to other subspecies of meadow jumping mouse, Preble's do not store food, but survive on fat stores accumulated prior to hibernation (Whitaker 1963). Apparent hibernacula (hibernation nests) of Preble's have been located both within and outside of the 100-year floodplain of streams (Shenk and Sivert 1999a, Ryon 2001, Schorr 2001). Those hibernating outside of the 100-year floodplain would likely be less vulnerable to flood-related mortality. Fifteen apparent Preble's hibernacula have been located through radio telemetry, all within 260 feet of a perennial streambed or intermittent tributary (Bakeman and Deans 1997, Shenk and Sivert 1999a, Schorr 2001).

Hibernacula have been located under willow, chokecherry, snowberry, skunkbrush, sumac (*Rhus* spp.), clematis (*Clematis* spp.), cottonwoods (*Populus* spp.), Gambel's oak, thistle (*Cirsium* spp.), and alyssum (*Alyssum* spp.) (Shenk and Sivert 1999a). At the Academy, 4 of 6 likely hibernacula found by radio-telemetry were located in close proximity to coyote willow (*Salix exigua*) (Schorr 2001). The one excavated hibernaculum at Rocky Flats was found 30 feet above the streambed, in a dense patch of chokecherry and snowberry (Bakeman and Deans 1997). The nest was constructed of leaf litter 12 inches below the surface in coarse textured soil.

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

Hydrologic regimes that support Preble's habitat range from large perennial rivers such as the South Platte River to small ephemeral drainages only 3 to 10 feet in width, as at Rocky Flats and in montane habitats. Flooding is a common and natural event in the riparian systems along the Front Range of Colorado. This periodic flooding helps create a dense vegetative community by stimulating resprouting from willow shrubs and allows herbs and grasses to take advantage of newly-deposited soil.

Reproduction

Preble's usually have two litters per year, but there are records of three litters per year. An average of five young are born, but the size of a litter can range from two to eight young (Quimby 1951, Whitaker 1963). Preble's are long-lived for a small mammal, in comparison with many species of mice and voles that seldom live a full year. Along South Boulder Creek, Boulder County, Colorado, seven individuals originally captured as adults were still alive two years later, having attained at least three years of age (Meaney *et al.*, 2002).

Predation

Preble's have a host of known predators including garter snakes (*Thamnophis* spp.), prairie rattlesnake (*Crotalus viridus*), bullfrog (*Rana catesbiana*), foxes (*Vulpes vulpes* and *Urocyon cinereoargenteus*), house cat (*Felis catus*), long-tailed weasel (*Mustela frenata*), and red-tailed hawk (*Buteo jamaicensis*) (Shenk and Sivert 1999a, Schorr 2001). Other mortality factors of Preble's include drowning and vehicle collision (Schorr 2001, Shenk and Sivert 1999a). Mortality factors known for the meadow jumping mouse, such as starvation, exposure, disease, and insufficient fat stores for hibernation (Whitaker 1963) are also likely causes of death for Preble's.

Diet

While fecal analyses have provided the best data on Preble's diet to date, they overestimate the components of the diet that are less digestible. The diet shifts seasonally; it consists primarily of insects and fungus after emerging from hibernation, shifts to fungus, moss, and pollen during mid-summer (July-August), with insects again added in September (Shenk and Sivert 1999a). The shift in diet along with shifts in mouse movements suggests that Preble's may require specific seasonal diets, perhaps related to the physiological constraints imposed by hibernation (Shenk and Sivert 1999a).

Population Dynamics

Preble's annual survival rate is low. Preble's survival rates appear to be lower over the summer than over the winter. Over-summer survival rates ranged from 22 to 78 percent and over-winter survival rates ranged from 56 to 97 percent (Shenk and Sivert 1999b, Schorr 2001, Meaney *et al.* 2002). Additionally, fire is a natural component of the Colorado Front Range and Wyoming foothills and Preble's habitat naturally fluctuates with fire events. Within shrubland and forest, intensive fire may result in adverse impacts to Preble's populations. However, in a review of the effects of grassland fires on small mammals, Kaufman *et al.* (1990) found a positive effect of fire on the meadow jumping mouse in one study and no effect of fire on the species in another study.

Status and Distribution

The Preble's meadow jumping mouse is found along the foothills in southeastern Wyoming, southward along the eastern edge of the Front Range of Colorado to Colorado Springs, El Paso County (Hall 1981, Clark and Stromberg 1987, Fitzgerald *et al.* 1994). Knowledge about the current distribution of the Preble's comes from collected specimens, and live-trapping locations from both range-wide survey efforts and numerous site-specific survey efforts conducted in Wyoming and Colorado since the mid-1990s. Recently collected specimens are housed at the Denver Museum of Nature and Science (DMNS) and survey reports are filed with the Service's Field Offices in Colorado and Wyoming.

In Wyoming, capture locations of mice confirmed as Preble's, and locations of mice identified in the field as Preble's and released, extend in a band from the town of Douglas southward along the Laramie Range to the Colorado border, with captures east to eastern Platte County and Cheyenne, Laramie County. Recently, Preble's have been documented west of the Laramie Range in the Upper Laramie drainage. In Colorado, the distribution of Preble's forms a band along the Front Range from Wyoming southward to Colorado Springs, El Paso County with eastern marginal captures in western Weld County, western Elbert County and north-central El Paso County.

Preble's is likely an Ice Age relict (Hafner *et al.* 1981, Fitzgerald *et al.* 1994). Once the glaciers receded from the Front Range of Colorado and the foothills of Wyoming and the climate became drier, Preble's was confined to the riparian (river) systems where moisture was more plentiful. The semi-arid climate in southeastern Wyoming and eastern Colorado limits the extent of riparian corridors and restricts the range of Preble's in this region. Preble's has not been found east of Cheyenne in Wyoming or on the extreme eastern plains in Colorado. The eastern boundary for the subspecies is likely defined by the dry shortgrass prairie, which may present a barrier to eastward expansion (Beauvais 2001).

The western boundary of Preble's range in both States appears related to elevations along the Laramie Range and Front Range. The Service has used 2,300 meters (7,600 feet) in elevation as the general upward limit of Preble's habitat in Colorado (Service 1998). Recent morphological examination of specimens has confirmed Preble's to an elevation of approximately 7,600 feet in Colorado (Meaney *et al.* 2001) and to 7,750 feet in southeastern Wyoming (Cheri Jones, DMNS, in litt., 2001). In a modeling study of habitat associations in Wyoming, Keinath (2001) found suitable habitat predicted in the Laramie Basin and Snowy Range Mountains (west of known Preble's occurrence) but very little suitable habitat predicted on the plains of Goshen, Niobrara, and eastern Laramie counties (east of known Preble's occurrence).

Preble's is closely associated with riparian ecosystems that are linear in nature and represent a small percentage of the landscape. If Preble's habitat is destroyed or modified, populations in those areas may decline or be extirpated. The decline in the extent and quality of Preble's habitat is considered the main factor threatening the subspecies (Service 1998, Hafner *et al.* 1998, Shenk 1998). Habitat alteration, degradation, loss, and fragmentation resulting from urban development, flood control, water development, intensive agricultural activities, and other human land uses have adversely affected Preble's populations. Habitat destruction may impact individual Preble's directly or by destroying nest sites, food resources, and hibernation sites, by disrupting behavior, or by forming a barrier to movement.

Although there is little information on past distribution or abundance of Preble's, surveys have identified various locations where the subspecies was historically present but is now absent (Ryon 1996). Despite numerous surveys, Preble's has not recently been found in the Denver and Colorado Springs metropolitan areas and is believed to be extirpated from these areas as a result of extensive urban development. Since at least 1991, Preble's has not been found in Denver,

Adams, and Arapahoe counties in Colorado. Its absence in these counties is likely due to urban development, which has altered, reduced, or eliminated riparian habitat (Compton and Hugie 1993, Ryon 1996).

The increasing presence of humans near Preble's habitats may result in increased level of predation that may pose a threat to Preble's. The striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), red fox, and the domestic and feral cat are found in greater densities in and around areas of human activity; all four of these species feed opportunistically on small mammals. Introduction of species such as the bullfrog into waters within Preble's range may result in additional predation. The fact that summer mortality is higher than overwinter mortality underscores the impact that predators can have on Preble's.

Threats

Conversion of native riparian ecosystems to commercial croplands and grazed rangelands was identified as the major threat to Preble's persistence in Wyoming (Clark and Stromberg 1987, Compton and Hugie 1993). Certain grazing and haying management scenarios maintain what appears to be good habitat for Preble's. However, intensive grazing and haying operations may negatively impact Preble's by removing food and shelter. While some Preble's populations coexist with livestock operations, overgrazing can decimate riparian communities on which Preble's depends. Similarly, haying operations (and the associated water development) that allow significant riparian vegetation to remain in place appear to be compatible with persistence of Preble's populations. In fact, the large populations of Preble's occur in grazed and hayed areas along Cottonwood Creek, Chugwater Creek, and Horse Creek in Wyoming.

Recreational trail systems frequently parallel or intersect riparian communities and thus are common throughout Preble's range. Trail development can alter natural communities and may impact Preble's by modifying nest sites, food resources, and hibernation sites; fragmenting its habitat; and increasing predation. Humans and pets using these trails may alter behavior patterns of Preble's and cause a decrease in survival and reproductive success.

Habitat fragmentation limits the extent and abundance of Preble's. In general, as animal populations become fragmented and isolated, it becomes more difficult for them to persist. Small, isolated patches of habitat are unable to support as many Preble's mice as larger patches of habitat. When threats to persistence are similar, larger populations are more secure from extirpation than smaller ones.

The structure and function of riparian ecosystems are determined by the hydrology of the waterway. Water development and management may facilitate development of lush riparian vegetation by maintaining more moisture in the riparian areas for longer periods of time, particularly in times of drought. However, changes in timing and abundance of water may also alter the channel structure, riparian vegetation, and the adjacent floodplain, in a manner that results in changes that are detrimental to the persistence of Preble's. Increased development and

impervious surface within a drainage can result in more frequent and severe flood events and prevent the maintenance of riparian communities. Bank stabilization, channelization, and other measures to address flooding and storm water runoff have increased the rate of stream flow, straightened riparian channels, and narrowed riparian areas (Pague and Grunau 2000). Using riprap and other structural stabilization options to reduce erosion can destroy riparian vegetation, and prevent or prolong its reestablishment. These measures can alter the hydrologic processes and plant communities present to the point where Preble's populations can no longer persist.

Alluvial aggregate extraction may produce long-term changes to Preble's habitat by altering hydrology and removing riparian vegetation. In particular, such extraction removes and often precludes reestablishment of habitat components required by Preble's. Such mining impacts the deposits of alluvial sands and gravels that may be important hibernation locations for the Preble's. Transportation and utility corridors frequently cross Preble's habitat and may negatively affect populations. As new roads are built and old roads are maintained, habitat can be destroyed or fragmented. Roads and bridges also may act as barriers to dispersal. Train and truck accidents within riparian areas may release spills of chemicals, fuels and other substances that may impact the mouse or its habitat. Sewer, water, communications, gas, and electric lines cross Preble's habitat. Their right-of-ways can contribute to habitat disturbance and fragmentation through new construction and periodic maintenance. However, construction-related impacts are often short term when adequate rehabilitation and reclamation actions are implemented.

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

Pesticides and herbicides are used within the range of Preble's. Inappropriate use of these chemicals may harm Preble's directly or when ingested by Preble's with food or water. Overall, an integrated pest management approach (use of biological, chemical, and mechanical control) may help reduce the threat of chemicals, but allow for the control of target species. Fire, particularly catastrophic fires, can alter habitat dramatically and change the structure and composition of the vegetation communities so that Preble's may no longer persist. In addition, precipitation falling in a burned area may degrade Preble's habitat by causing greater levels of erosion and sedimentation along creeks. Controlled use of fire may be one method to maintain appropriate riparian, floodplain, and upland vegetation within Preble's habitat. However, over the past several decades, as human presence has increased through Preble's range, significant effort has been made to suppress fires. Long periods of fire suppression may result in a build-up of fuel and result in a catastrophic fire.

On July 9, 2008, the Service determined that Preble's populations in Wyoming should be removed from protected under the Act, but concluded that Preble's populations in Colorado

comprise a significant portion of its range requiring continued protection and that Colorado populations would remain listed.

ENVIRONMENTAL BASELINE

Although the habitat quality varies widely, all of the drainages contain the dense herbaceous understory, shrubbery, and open overstory associated with Preble's habitat. There are approximately 941.23 acres of Preble's habitat at the Site. Introduced and noxious plant species are also present in all of the drainages despite intense site-wide weed control efforts. Previous trapping and telemetry studies indicate that these riparian areas are extensively utilized by Preble's for feeding, nesting, breeding, dispersal, and/or hibernation. Preble's mice have been captured in all of the site's major drainages: Rock, Woman, North and South Walnut Creeks. Preble's have been captured near the A-series ponds above the A-3 pond, B-series ponds above the B-5 pond in the Walnut Creek drainage, and adjacent to the C-series ponds above and below the C-1 pond, between the C-1 and C-2 ponds, but not below the C-2 pond or in the diversion ditch around C-2 in the Woman Creek drainage. In the pond areas, habitat consists of open water ponds surrounded by short and tall marsh habitats along pond edges, and grasslands in the surrounding upland areas. At some locations upstream and downstream of the ponds and dams themselves, coyote willow, plains cottonwood, and false indigo are commonplace. No mice have been trapped downstream from the C-2 pond, possibly due to the more xeric conditions.

The xeric tallgrass prairie, tall upland shrubland, wetland, and Great Plains riparian woodland vegetation types present on-site have been identified by the Colorado Natural Heritage program as increasingly rare and unique.

In the time since the listing of the Preble's, May 1998, through June 2008, we have conducted 124 formal consultations pursuant to section 7 of the Act and issued 20 incidental take permits pursuant to section 10(a)(1)(B) of the Act regarding Preble's in Colorado. Through these actions, we have exempted or permitted incidental take of Preble's through over 842 acres of permanent habitat loss and over 1,729 acres of temporary habitat loss.

EFFECTS OF THE ACTION

For determination of impacts to Preble's habitat, habitat quality was defined based on the 1996 Site vegetation map that was used to produce the current Preble's protection plan map. Using the Site's Geographic Information System (GIS), project footprints and the current Preble's protection area GIS coverages were overlain to determine the amount of area specific projects might impact in Preble's habitat. With this information, the 1996 vegetation map was used to identify different plant communities and habitat types within the potentially affected Preble's habitat. Higher quality habitat is defined as all woody vegetation classifications and short marsh, tall marsh, and wet meadow wetland types. Lower quality habitat was defined to include all grassland classifications, mud flats, and other disturbed community types. Open water, riprap, concrete, roads, and structures were not considered habitat for the Preble's mouse. This

information was used in the GIS effort to calculate the total number of acres of potential temporary and permanent impacts to both lower and higher quality habitat within project footprints. Any areas where additional riprap, concrete, roads, or structures are placed in the future will be considered as permanent habitat loss for Preble's.

SPPTS Phase I Upgrade activities will permanently disturb approximately 75 square feet (0.002 acre) and temporarily disturb a maximum of approximately 26,600 square feet (0.61 acres) of Preble's habitat. Preble's individuals may be taken due to construction and/or restoration, enhancement, and/or revegetation efforts within their habitat. Additional take is expected to result from indirect effects due to habitat modification and destruction.

Secondary impacts of the proposed projects to Preble's may include temporary increases in noise, light, dust, stormwater runoff and sedimentation, pollution, disruption of travel corridors, and human activities related to the normal implementation of the project remediation activities.

The project sites will be revegetated with native species. Higher quality Preble's habitat will be revegetated at a 2:1 ratio of mitigation acres to potential impact acres. Lower quality areas will be revegetated based on a 1.5:1 ratio.

The final approval of acreages credited as appropriate and successful mitigation for impacts to Preble's mice will be determined by the Service.

Cumulative Effects

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

Substantial development is occurring in Jefferson County. Various development projects are planned adjacent to the Rocky Flats Site, both upstream and downstream from the project site. While development in other areas of Jefferson County that contain Preble's habitat may undergo section 7 review, others may not. In the latter case, projects would be required to pursue Habitat Conservation Plans (HCPs) and section 10 permits where take of Preble's is likely. However, the Service is required to conduct internal section 7 review of issuance of section 10 permits that may result from these HCPs. Future development in the area may result in a variety of direct and secondary impacts to Preble's and its habitat. Cumulatively, such activities may degrade and fragment habitat within this drainage and contribute to reduction or loss of Preble's populations in the area around Rocky Flats.

Potential impacts to Preble's from predicted future climate changes are somewhat uncertain. A trend of warming in the mountains of western North America is expected to decrease snowpack, hasten spring runoff, and reduce summer flows (IPCC 2007). Stream-flow reductions or

seasonal changes in flow due to climate change will probably cause a greater disruption in those watersheds with a high level of human development (Hurd et al. 1999). The two major river basins that support Preble's in Colorado have heightened vulnerability to the effects of climate change due to the degree of human development, natural variability in stream-flow, ratio of precipitation lost to evapotranspiration, and groundwater depletion (Hurd et al. 1999). Conflicts between human needs for water and maintenance of existing wetland and riparian habitats could be heightened. While fewer cold days and nights could result in increased plant biomass yield in colder environments, increased summer heat may increase the frequency and intensity of wildfires, and areas affected by drought may increase (IPCC 2007). Overall, it appears reasonable to assume that Preble's will be affected negatively by climate change, and that changes in stream flows and resultant effects on riparian habitats may be a key factor. Adverse impacts seem more likely in those drainages where human demand for water resources is greatest; however, we lack sufficient certainty to predict more specifically how climate change will affect Preble's populations.

CONCLUSION

After reviewing the current status of Preble's, the environmental baseline for the action area, the effects of the proposed development, and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of Preble's. Because no critical habitat is present in the project area, we also conclude that the proposed action is not likely to destroy or adversely modify designated critical habitat for Preble's.

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 to 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 act or omission that creates the likelihood of injury to listed wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the 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 the DOE so that they become binding conditions, as appropriate, for the exemption in section 7(o)(2) to apply.

The DOE has a continuing duty to regulate the activity covered by this incidental take statement. If the DOE (1) fails to assume and implement the terms and conditions or (2) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, DOE must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement. [50 CFR §402.14(i)(3)]

Amount or Extent of Take Anticipated

The Service anticipates incidental take of Preble's through direct killing and by loss of food, cover, and other essential habitat elements. This take will be difficult to detect because of their small size and hibernation underground. However, the following level of take can be anticipated by the loss of food, cover, and other essential habitat elements. The Service anticipates that the proposed action will result in incidental take of Preble's through a maximum permanent and temporary loss of no more than 26,675 square feet (0.612 acres) of Preble's habitat.

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of its designated critical habitat.

Reasonable and Prudent Measures

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

1. The DOE will monitor the extent of habitat impacted to ensure that it does not exceed the authorized area or the authorized take limits.
2. The DOE will require timely revegetation and enhancement of the project area, as described in the conservation measures and project descriptions, to minimize the disturbance to Preble's habitat.
3. The DOE will ensure that mitigation efforts are successful in protecting, restoring, and enhancing Preble's habitat and report on its progress.

Terms and Conditions

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

The following terms and conditions implement reasonable and prudent measures:

1. To implement Reasonable and Prudent Measure #1, the DOE shall:
 - a. Ensure that BMPs designed to minimize take are implemented and are successful, including those for revegetation and erosion control.
 - b. Ensure that Preble's habitat not designated for remedy, construction or restoration actions will be marked off with erosion barrier or other appropriate fencing to prevent inadvertent impacts to habitat outside the project footprint.
 - c. Collect geospatial data on the actual footprint of disturbance after the activity is completed.
 - d. Ensure that workers on-site will be informed about the reason for and importance of limiting disturbances and impacts to Preble's habitat outside of the fenced work areas.
2. To implement Reasonable and Prudent Measure #2, the DOE shall:
 - a. Ensure seeding is completed as soon as the planting windows/timeframe allows.
3. To implement Reasonable and Prudent Measure #3 above, the DOE shall:
 - a. Conduct monitoring of restoration and enhancement efforts, which shall include photographs, geospatial data, spreadsheets, and other necessary information to determine the extent and effects of construction and the implementation and effectiveness of such efforts, until success criteria as defined in Appendix B of the PBA Part II are met. Reports of this information shall be forwarded to the Service after each growing season and prior to December 1.
 - b. Monitor habitat restoration and enhancement areas for a minimum of three growing seasons, and until such time as DOE and the Service determine that the required restoration and enhancement have met the success criteria (refer to PBA Part II, Appendix B, Mitigation Monitoring Plan). If supplemental irrigation of habitat restoration or enhancement vegetation is provided, success shall be assessed by the Service only after at least two growing seasons without supplemental irrigation.
 - c. Ensure implementation of habitat restoration and enhancement is supervised by an entity experienced in reclamation or habitat restoration.
4. To implement all Reasonable and Prudent Measures (#1 through #3) DOE shall:
 - a. Provide advance notice to the on-site Service representative on project activities planned for the upcoming week in Preble's habitat areas.

- b. Provide access for inspection at any time by the on-site Service representative, with the proper accommodations made for any safety requirements for the work site.
 - c. Provide notification upon initiation of disturbance resulting from project activities to the on-site Service representative.
 - d. Provide notification of final sign-off on project activities in Preble's habitat areas to the on-site Service representative.
 - e. Provide updated Preble's Mouse Mitigation Debit/Credit Spreadsheet (refer to PBA Part II, Appendix G) information as projects and mitigation efforts are completed on an annual basis to the on-site Service representative.
5. In the unlikely event that a Preble's mouse is encountered (dead, injured, or hibernating) during construction activities, the Colorado Field Office of the Service will be contacted at (303) 236-4773 immediately.

The Service believes that no more than 0.612 acres of Preble's habitat will be adversely affected as a result of the proposed action. 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 action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The DOE must immediately provide an explanation of the causes of the increased level of 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 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.

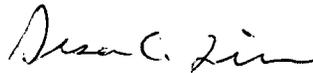
The Service has no conservation recommendations at this time.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the action(s) outlined in the request. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency

action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation. If the Service can be of further assistance, please contact Alison Deans Michael at (303) 236-4758.

Sincerely,



Susan C. Linner
Colorado Field Supervisor

cc: Stoller (Jody Nelson)
Michael

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