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August 24, 2005

Memorandum

To: Assistant Regional Director, Ecological Services, Region 6

From:  Habitat Conservation Planning Coordinator, Ecological Services, Region 6

Subject: Intra-Service Consultation on the Issuance of a 10(a)(1)(B) Permit for the Livermore Area

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of your proposed issuance of a permit pursuant to section 10(a)(1)(B) of the Endangered Species Act (ESA) and its effects on the Preble's meadow jumping mouse (*Zapus hudsonius preblei*) (Preble's), in accordance with section 7 of the ESA of 1973, as amended (16 U.S.C. 1531 et seq.). This biological opinion is based on the Livermore Habitat Conservation Plan (HCP) and Environmental Assessment (EA) (EDAW 2003), and information in our files.

Consultation History

On May 13, 1998, the Preble's was listed as threatened under the ESA. Full protection for the Preble's became effective on June 12, 1998. The area to be affected by the proposed Livermore HCP contains habitat suitable for Preble's and is believed to contain one of the largest documented populations within the range of the species. Preble's have been documented along the Forth fork Cache la Poudre River, Meadow Creek, Fish Creek, Bull Creek, Long Pine Creek, Middle and North Forks Rabbit Creek, Stonewall Creek, Dale Creek, Koch Pond #1, and the Livermore Main Irrigation Ditch (Colorado Department of Natural Resources Science Team 1999). The proposed project is likely to adversely affect Preble's and result in incidental take. On June 23, 2003, critical habitat for Preble's was designated. The project area lies within Unit SP4 of designated critical habitat.

The initial draft of the HCP was received in June 2002. We responded with comments on August 1, 2002. Subsequent to our response we met with the applicant several times to discuss issues related to the HCP. On January 13, 2004, we announced that an October 2003 version of the HCP was available for public review and comment.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

We propose to issue a permit to the Livermore Area Landowner's Group to incidentally take Preble's during the course of agricultural activities, limited new construction in support of agricultural activities and residences, and other appurtenant activities and structures. A thorough description of the action can be found in the HCP itself (section 4, pages 20 to 25) and is incorporated herein by reference (Livermore Area Landowners Group 2003). As a point of clarification, the HCP references several activities that are covered in a 4(d) rule finalized by the Service on May 20, 2005 (69 FR 29101). These activities will not be covered by the incidental take permit, because they are not considered to be take.

The HCP includes several conservation measures that also are considered to be part of the proposed action. These conservation measures are contained in section 5 of the HCP and are incorporated herein by reference.

SPECIES DESCRIPTION

The Preble's 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 1 of 12 subspecies of meadow jumping mouse (Hafner et al. 1981).

The Preble's 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 is approximately 7 to 10 inches and tail length is 4 to 6 inches (Krutzsch 1954; Fitzgerald et al. 1994). The average weight of 120 adult Preble's captured early in their active season (prior to June 18) was 0.6 ounce; included were 10 pregnant females weighing more than 0.8 ounce (Meaney et al., 2002).

The Service listed the Preble's as a threatened species on May 13, 1998 (63 FR 26517).

Life History

HABITAT

Typical habitat for Preble's 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 also may 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 also can 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 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 Environmental Technology 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 7 or 8 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, four of

six 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 also can be below ground. They are typically found under debris at the base of shrubs and trees, or in open grasslands (Ryon 2001). An individual mouse can have multiple day nests in both riparian and grassland communities (Shenk and Sivert 1999a), and may abandon a nest after approximately a week of use (Ryon 2001).

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 2 years later, having attained at least 3 years of age (Meaney et al., 2002).

PREDATION

Preble's have a host of known predators including garter snakes (*Thamnophis* spp.), prairie rattlesnake (*Crotalus viridis*), 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) also are 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 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. 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 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 also may 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 also may 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.

Critical Habitat

This biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statute and the August 6, 2004, Ninth Circuit Court of Appeals decision in *Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service* (No. 03-35279) to complete the following analysis with respect to critical habitat.

The Service designated critical habitat for the species on June 23, 2003 (68 FR 37275). Critical habitat for Preble's includes approximately 125.1 miles of rivers and streams and 10,542 acres of lands in Wyoming and approximately 234.1 miles of rivers and streams and 20,680 acres of lands in Colorado. Lands designated as critical habitat are under Federal, State, local government, and private ownership. No lands designated as critical habitat are under Tribal ownership. Critical habitat was designated in two units within the North Platte River drainage and six units within the South Platte River drainage.

Designated critical habitat units include only river and stream reaches, and adjacent floodplains and uplands, that are within the known geographic and elevational range of the Preble's, have the primary constituent elements present, and, based on the best scientific data available, are believed to currently support Preble's.

We considered several qualitative criteria to judge the current status and probable persistence of Preble's populations in the selection and designation of specific areas as critical habitat. These include--the quality, continuity, and extent of habitat components present; the state of natural hydrological processes that maintain and rejuvenate suitable habitat components; the presence of lands devoted to conservation, either public lands such as parks, wildlife management areas, and dedicated open space, or private lands under conservation easements; and the landscape context of the site, including the overall degree of current human disturbance and presence, and likelihood of future development based on local planning and zoning.

Primary constituent elements are physical and biological features essential to the conservation of the species and that may require special management considerations and protection. For Preble's, primary constituent elements include those habitat components essential for the

biological needs of reproducing, rearing of young, foraging, sheltering, hibernation, dispersal, and genetic exchange. The primary constituent elements for Preble's include--1) a pattern of dense riparian vegetation consisting of grasses, forbs, and shrubs in areas along rivers and streams that provide open water through the Preble's active season; 2) adjacent floodplains and vegetated uplands with limited human disturbance (including hayed fields, grazed pasture, other agricultural lands that are not plowed or disced regularly, areas that have been restored after past aggregate extraction, areas supporting recreational trails, and urban/wildland interfaces); 3) areas that provide connectivity between and within populations; and 4) dynamic geomorphological and hydrological processes typical of systems within the range of the Preble's, i.e., those processes that create and maintain river and stream channels, floodplains, and floodplain benches, and promote patterns of vegetation favorable to Preble's.

Activities with the potential for altering the above primary constituent elements are those that result in development or alteration of the landscape within a unit, including land clearing activities associated with construction for urban and industrial development; some agricultural activities; activities resulting in changes in the hydrology of a unit; activities that detrimentally alter natural processes in a unit; activities that could lead to the introduction, expansion, or increased density of exotic plant or animal species detrimental to Preble's and its habitat.

ENVIRONMENTAL BASELINE

The environmental baseline is defined as the past and present effects of all Federal, State, or private actions and other human activities in the action area, the anticipated effects of all proposed Federal actions in the action area that have already undergone formal or early section 7 consultation, and the effects of State or private actions that are contemporaneous with the consultation in progress.

Status of the Preble's Within the Action Area

In Larimer County, Preble's has been captured or has suitable habitat along portions of Cache La Poudre River, North Fork of the Cache La Poudre River, Buckhorn Creek, Little Thompson River, and their major tributaries. A large population is believed to be present downstream of Halligan Reservoir, with two small populations upstream of the reservoir (HCP, p. 18). Based on the availability of potentially suitable habitat and lack of trapping information, Preble's likely occupies more habitat within Larimer County than is currently known.

Most of the information concerning the known locations of Preble's within the action area comes as a result of presence/absence surveys. Thus, no specific information concerning the numbers of Preble's within the action area exists. Because of the lack of population data, the Preble's Recovery Team used habitat quality and suitability as a surrogate for the status of the mouse in the Livermore area. White and Shenk (2000) determined that riparian shrub cover, tree cover, and the amount of open water nearby are predictors of Preble's densities. Vegetation analyses using infrared aerial photography revealed that potentially suitable vegetation for Preble's is available throughout much of the action area. Based on the large amount of suitable habitat, the

EFFECTS OF THE ACTION

The effects of the action are described in the chapter 7 of the HCP. Within the action area, a maximum of 20 percent of the Preble's habitat would be adversely affected by the proposed action. This amount corresponds to 28.8 stream miles, or 3,356.7 acres, if all parties enroll and implement the maximum allowable development.

Any Preble's occurring within lands proposed for loss could be adversely affected by the proposed action. For the most part, adults should be able to disperse to adjacent unaffected areas; however, hibernating individuals and young in litters may be killed by earth-moving activity. The conservation strategy includes a measure to schedule certain activities during mid-September to mid-May to the maximum extent practicable; this measure would reduce the probability of young being killed but could increase the number of adults crushed if they are hibernating and unable to flee. In addition, the HCP was not clear which activities would be subject to this measure, nor what scenarios would be deemed practicable, so we cannot determine the extent to which this measure would reduce Preble's mortality.

The resulting habitat loss would come as a result of the ranching, farming, and passive recreation activities, as well as the construction and maintenance of structures and facilities in support of these activities described in section 4 of the HCP. The listing rule for Preble's cites habitat loss and fragmentation as the primary threat to the species. The measures contained in the HCP would minimize the threat of fragmentation and reduce habitat loss to 20 percent of the action area. The covered activities would not result in development to the degree that it would displace Preble's within the action area. We anticipate that Preble's will continue to exist in the areas proposed for avoidance and the mitigation areas. These areas will be interspersed in a matrix that will allow for survival and recovery of the mouse within the project area as a whole.

The area to be impacted represents 20 percent the upland Preble's habitat present. Despite this seemingly large impact, we conclude that this will not result in a substantial reduction in Preble's numbers within the action area, because the applicant has incorporated measures to maintain connectivity of habitat. This means that Preble's that are disturbed by project activities will have the opportunity to relocate to intact habitat nearby. The balance of the habitat left intact is sufficient to allow for a healthy Preble's population throughout the action area. The project will not significantly impact the ability of Preble's to travel upstream or downstream along the riparian corridors within the action area, because the applicant has proposed to maintain habitat connectivity.

Some of the activities described in section 4 of the HCP are activities that were covered in our 4(d) rule for Prebles. This subset of the proposed action is determined to be generally consistent with the survival and recovery of Preble's, as is described in our 4(d) rule for the species (66 FR 28125, made permanent by 69 FR 29101), incorporated herein by reference.

The impacts described above will be offset in large part by the mitigation proposed for the action. Landowners who impact more than 3 percent of the conservation zone on their property will protect additional lands within the conservation zone in perpetuity at a 4:1 ratio or will create or enhance habitat within permanently protected lands at a 2:1 ratio. This ratio would

result in 80 percent of the conservation zone being permanently protected upon full enrollment and maximum impact. Permanent protection of habitat is the single-most important recovery action for the species, to remove the threat of loss of habitat. Creating and enhancing habitat will result in a net benefit to the mouse, as habitat quality in the mitigation lands will be better than without the project.

Summary of Effects to the Species

The proposed action will result in adverse effects to individual mice that occur in project impact areas during the time of the action. However, these individuals should be able to relocate to nearby habitat. The overall impact to the mouse comes from impacts from proposed activities that occur in approximately 20 percent of the overall habitat. This amount of loss will not result in an appreciable reduction of the ability of Preble's to survive and recover. In addition, this loss will be offset by permanent protection of habitat at a 4:1 ratio and enhancement of habitat at a 2:1 ratio. The protection and enhancement lands will increase in habitat value and be able to support a larger population than they currently do.

EFFECTS TO CRITICAL HABITAT

By permanently affecting a percentage of the available habitat for Preble's within the action area, the project also will be adversely affecting some of the primary constituent elements of critical habitat. Effects to each PCE are discussed in more detail below.

Effects to PCE #1

The first PCE is a pattern of dense riparian vegetation consisting of grasses, forbs, and shrubs in areas along rivers and streams that provide open water through the Preble's active season. By permanently removing Preble's habitat, the action will adversely affect dense riparian vegetation in some locations. The result will be a net loss in the amount of riparian vegetation throughout the action area. Not all areas that will be permanently altered will likely contain a pattern of dense riparian vegetation that qualifies as PCE #1. However, we do not have precise information on the extent and quality of the dense riparian vegetation in the action area, as that level of habitat mapping. Therefore, we anticipate that, because no more than 20 percent of the habitat within the conservation zone would be lost, a similar percentage of PCE #1 could be adversely affected. Thus, we anticipate that the amount of this PCE in the action area also would be reduced by approximately 20 percent.

The first PCE also will be beneficially affected by the measures in the HCP related to habitat enhancement and weed control. Some lands where the PCEs are lost will be mitigated by enhancement of habitat at a 2:1 ratio. Habitat improvement activities under the HCP would be designed to "actively promote the increase of stem density, percentage of cover, structure and/or diversity of native riparian, wetland, or upland vegetation" (HCP at page 30). Therefore, enhancement activities would increase the amount of this PCE. Because we are unsure to what degree subpermittees would choose enhancement (at a 2:1 ratio) over protection (at a 4:1 ratio),

we do not know if the mitigation strategy would end up fully replacing the amount of PCE #1 lost from project impacts. However, it should result in a net loss of PCE #1 that is less than the 20 percent described above.

Effects to PCE #2

The second PCE consists of adjacent floodplains and vegetated uplands with limited human disturbance. Examples of uplands with limited human disturbance includes hayed fields, grazed pasture, other agricultural lands that are not plowed or disced regularly, areas that have been restored after past aggregate extraction, areas supporting recreational trails, and urban/wildland interfaces. These types of floodplain habitats are prevalent throughout the action area. As with the above PCE, we do not have specific information on the degree to which compatible uses within the adjacent floodplains and vegetated uplands will be replaced by incompatible uses. Therefore, we anticipate that approximately 20 percent of the land functioning as this PCE will be adversely affected, as that corresponds to the overall amount of affected lands.

The HCP proposes to allow covered landowners to mitigate for their impacts by creating habitat by converting areas of non-habitat such as driveways, roads, corrals, lawns, and denuded lands at a 2:1 ratio. To the extent to which this occurs, it would reduce the overall impact to 20 percent of this PCE as described above. As with PCE #1, at this time we cannot know how many landowners will choose this option over permanent protection of habitat at a 4:1 ratio.

Effects to PCE #3

The third PCE consists of areas that provide connectivity between and within populations. We do not anticipate that the proposed action will have substantial adverse effects to this PCE, because the applicant has proposed to maintain habitat connectivity to the maximum extent practicable. The HCP outlines four examples of situations where avoidance is not practicable (HCP, page 28). Although there will be some situations where maintaining habitat connectivity will not be practicable, we anticipate that these situations will be relatively rare and do not anticipate that these rare instances would result in “severing” existing connectivity. The more likely scenario is that a “pinch point” could be created but that Preble’s would still be connected through the riparian corridor to some degree. Therefore, we do not anticipate that this PCE would be substantially adversely affected by the proposed action.

The mitigation strategy in the HCP includes flexibility to create new habitat that act as linkages and connect more recovery habitat. To the extent that this mitigation measure is used, it would result in beneficial effects to PCE #3 by increasing connectivity.

Effects to PCE #4

The fourth PCE are the dynamic geomorphological and hydrological processes typical of systems within the range of the Preble’s. These processes create and maintain river and stream channels, floodplains, and floodplain benches, and promote patterns of vegetation favorable to

Livermore Area is believed to be able to support one of the largest populations of Preble's (Pague in litt. 2003). For this reason, our current conservation strategy for the species designates this area as one that could support a large population for the purposes of recovery.

Factors Affecting the Environment of the Preble's Within the Action Area

From the final listing of the Preble's through November 2004, we have conducted 122 formal consultations pursuant to section 7 of the ESA and issued 14 incidental take permits pursuant to section 10(a)(1)(B) of the ESA throughout the range of the Preble's in Colorado. Through these actions, we have exempted or permitted incidental take of Preble's within 574 acres of permanent habitat loss and 347.6 acres of temporary habitat loss. A total of 205 acres of temporary impacts and 3.7 acres of permanent impacts within Larimer County have occurred as a result of the covered activities in these consultations and permits (Peter Plage, Service, pers. comm. 2005). These impacts represent a small portion (less than 1 percent) of the more than 20,000 acres of total habitat available to Preble's in the county. For this reason, and because the very few of the impacts have permanently removed habitat, we conclude that these actions have resulted in a substantial adverse impacts to Preble's within the action area.

The HCP lists additional threats within the action area that were identified by the Colorado Department of Natural Resources Science Team (1999)--habitat conversion to residential commercial, and industrial uses; fragmentation of habitat and corridors; intensive livestock management in fenced or confined areas; hydrological impairment of water quantity and flow regime; groundwater depletion; presence or proliferation of certain weeds; rodent diseases; predation by domestic cats; increased populations of native meso-predators associated with human development or enhanced populations of competitors; bank stabilization that alters the geomorphic succession; transportation corridor construction or maintenances; and catastrophic and random events.

We do not have more specific information on the degree and scale of these threats within the action area; however, based on the infrared aerial photography, we conclude that the habitat-related threats are low. Because of the relatively rural nature of the action area, we believe that threats from native and non-native competitors and predators also are low.

Critical Habitat

The proposed action lies with Unit SP4 of designated critical habitat. The total amount of critical habitat within this unit is 8,206 acres. Approximately 81 stream miles of the critical habitat unit lie within the action area. This amount represents 92 percent of the 88 stream miles within the unit. The unit was designated to provide habitat for recovery of the large population called for in the conservation strategy for the species. The designated habitat would support all essential survival needs of the Preble's, including feeding, breeding, and sheltering. The area is rural and agricultural with habitat components that are likely to support relatively high densities of Preble's. All four Primary Constituent Elements (PCEs) essential to the conservation of the species are present within the unit.

Preble's. The proposed action does not include any elements that would alter the geomorphological and hydrological processes in force within the action area. Therefore, we do not anticipate any adverse effects to this PCE.

Summary of Effects to Critical Habitat

Two of the four PCEs of Preble's critical habitat will be adversely affected by the proposed action. These adverse impacts could occur in up to 20 percent of the available habitat, and would be offset by the proposed mitigation measures. Overall, impacts of up to 20 percent of the critical habitat in the action area would not reduce the function of the critical habitat unit to provide for the conservation of Preble's. These areas are likely to be interspersed with unimpacted areas and areas of habitat enhancement where the PCEs are created or improved. The remaining 80 percent of habitat is sufficient to meet our recovery goals for the species. In addition, protection and enhancement of the remaining 80 percent of critical habitat will contribute to the conservation of the species by permanently removing the major threat of habitat loss.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA. Because the HCP anticipates all non-Federal activities within the action area that could result in effects to Preble's, we do not know of any additional projects within the action area.

CONCLUSION

After reviewing the current status of Preble's, the environmental baseline for the action area, the effects of the proposed covered activities described in the Livermore HCP and the cumulative effects, it is the Service's biological opinion that the issuance of a 10(a)(1)(B) permit to the Livermore Area Landowners Group and The Nature Conservancy as proposed, is not likely to jeopardize the continued existence of the Preble's. We base our conclusion on the following-- 1) impacts to 20 percent of the available habitat would not preclude recovery of the species; 2) the goal of the HCP, to protect a large population of up to 2,500 mice, is consistent with our conservation strategy for the species; 3) the proposed mitigation will contribute to recovery by removing the threat of habitat loss in up to 80 percent of the available habitat; 4) measures to control weeds and enhance and create habitat will increase the habitat quality of some areas for Preble's.

We also conclude that the proposed action is not likely to destroy or adversely modify designated critical habitat. We base this conclusion on the following rationale-- 1) not all of the PCEs will be adversely affected by the proposed action; 2) for the two PCEs that will be adversely affected, no more than 20 percent of the habitat containing the PCE would be affected; 3) areas with affected PCEs will be interspersed with unimpacted areas as well as areas where PCEs will be

improved by habitat enhancement and creation; and 4) the function of the unit to conserve the mouse in Larimer County by protecting sufficient breeding, feeding and sheltering habitat will not be impaired.

These conclusions are consistent with our findings on the issuance of a 10(a) permit document.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulation pursuant to 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or 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 wildlife by annoying it 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 otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Service so that they become binding conditions of any grant or section 10(a) Permit issued to the Applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The Service has the continuing duty to regulate the activity covered by this Incidental Take Statement. The Service must ensure that the Applicant is required to assume and implement the terms and conditions of the Incidental Take Statement through enforceable terms that are added to the section 10(a) Permit, or the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Service will require the Applicant to report the progress of the action or its impact on the species as specified in the Incidental Take Statement.

The Service anticipates incidental take of Preble's through direct killing will be difficult to detect due to their small size and secretive nature. 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 an undetermined number of Preble's through a maximum total permanent loss of 3,356.7 acres (or 28.8 stream reach miles) within the covered lands, and any harm or harassment of individuals during associated project construction, use, and maintenance. In this Biological Opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species.

REASONABLE AND PRUDENT MEASURES

The Service believes that the following reasonable and prudent measure is necessary and appropriate to minimize impacts of incidental take of Preble's and, therefore, should be added to the section 10(a) Permit requirements:

The Service shall ensure that each permittee under the Livermore Area HCP complies with the measures contained in the HCP, including the implementation of all the minimization measures, and provide the permittees with technical assistance throughout the life of the permit.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the ESA, the Service must comply with the following terms and conditions, which implement the reasonable and prudent measure described above and outline reporting and monitoring requirements. These terms and conditions are non-discretionary.

1. The Service must condition the section 10(a)(1)(B) incidental take permit to include all measures proposed in the HCP.
2. The Service must require the applicant to track habitat impacts to comply ensure that no more than 3 percent of enrolled lands are impacted without mitigation (1 percent of enrolled The Nature Conservancy, Colorado Division of Wildlife, and State Land Board lands) and no more than 20 percent of the conservation zone is impacted in sum. The applicant also shall track mitigation lands to ensure that mitigation ratios are being obtained.
3. The Service must annually monitor compliance with the HCP through the review of annual reports submitted and occasional on- and off-site inspections coordinated with participating landowners.
4. The Service, at the Permittees request, must provide technical assistance on the implementation of the HCP and the conservation of the Preble's.
5. The Service, as a last resort, must revoke the permit if changed or unforeseen circumstances occurred that meant the continuation of permitted activities would likely result in jeopardy to covered species (50 CFR 17.22/32(d)(7)). The Service will revoke because of jeopardy concerns only after first implementing all practicable measures to remedy the situation.
6. The Service will include, as a Permit condition, that the Permittee shall notify the Service of any transfer of ownership of any lands within the permitted HCP project area, before the transfer is finalized. The new landowner will be regarded by the Service as having the same rights with respect to the Permit as the original landowner, provided that the new landowner agrees to be bound by the terms and conditions of the original Permit, as explained by the original Permittee upon Permit transfer. Actions taken by the new landowner resulting in the

incidental take of species covered by the Permit would be authorized if the new landowner agrees to the Permit and continues to implement the minimization and mitigation strategies of the HCP.

7. In the unlikely event that a Preble's (dead, injured, or hibernating) is located during construction, the Colorado Field Office of the Service (303) 275-2370 or the Service's Law Enforcement Office (720) 981-2777 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 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 Service must immediately provide an explanation of the causes of the taking and review the need for possible modification of the reasonable and prudent measures.

REINITIATION NOTICE

This concludes formal consultation on the Service's issuance of a 10(a)(1)(B) permit for the activities outlined in the Livermore Area HCP. 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.

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