

Record of Decision 4: Appendix J

Programmatic Biological Opinion

April 2017





United States Department of the Interior



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

IN REPLY REFER TO:
ES/LK-6-CO-12-F-001
TAILS: 65412-2011-F-0658

OCT 13 2011

John Cater, Division Administrator
Colorado Federal Aid Division
U.S. Department of Transportation, Federal Highway Administration
12300 West Dakota Avenue, Suite 180
Lakewood, Colorado 80228

Dear Mr. Cater:

In accordance with section 7 of the Endangered Species Act (Act) as amended (16 U.S.C. 1531 et seq.) and the Interagency Cooperative Regulations (50 CFR 402), this document transmits the U.S. Fish and Wildlife Service's (Service) final programmatic biological opinion on impacts to the federally threatened Least Tern (*Sternula antillarum*), Piping Plover (*Charadrius melodus*), and Western prairie fringed orchid (*Platanthera praeclara*), the endangered Whooping Crane (*Grus americana*) and Pallid sturgeon (*Scaphirhynchus melodus*), collectively known as the Platte River species; as well as the threatened Preble's meadow jumping mouse (*Zapus hudsonius preblei*), Colorado butterfly plant (*Gaura neomexicana coloradensis*), and Ute ladies'-tresses orchid (*Spiranthes diluvialis*); and the endangered black-footed ferret (*Mustela nigripes*), from the Federal Highway Administration's (FHWA) authorization and funding of highway and transit improvements on I-25 between Denver and Fort Collins in Adams, Boulder, Broomfield, Denver, Larimer, and Weld counties, Colorado. The project will be constructed by the Colorado Department of Transportation (CDOT) with the participation and funding of the FHWA. Your request for formal consultation was received by the Service on August 8, 2011.

This biological opinion is based on the project proposal as described in the July 2011, report entitled "Final Programmatic Biological Assessment, Adams, Boulder, Broomfield, Denver, Larimer, and Weld counties, Colorado" (biological assessment), the "North I-25 Final Environmental Impact Statement, August 2011" (FEIS), as well as subsequent email and telephone correspondence. The biological assessment programmatically addresses the potential direct, indirect, and cumulative impacts to listed species in the project study area due to implementation of the preferred alternative. In addition, because of the length of time it will take to implement the entire preferred alternative, the biological assessment defines the process for future consultations as they are needed. Subsequent site-specific analysis will be required for any future components of the proposed action. These site-specific analyses will be much more detailed in terms of project design and impact, and avoidance and minimization measures will be defined and implemented at that level.

The Service concurs with your determination that the proposed project is likely to adversely affect the Platte River species, and the Preble's meadow jumping mouse. In addition, the Service concurs with your determination that the project is not likely to adversely affect the Colorado butterfly plant or the Ute ladies'-tresses orchid because we currently do not believe that habitat or populations of these species occur within the project area; therefore, they will not be directly affected. However, given that the project is not likely to commence for many years and given that full implementation is likely to take many additional years, surveys for appropriate habitat will be conducted during site-specific analysis and if any habitats or plants are detected, reanalysis of effects may become necessary. The Colorado butterfly plant and Ute ladies'-tresses orchid will not be considered further in this document. Finally, the project will occur within the block-cleared area for the black-footed ferret and will therefore have no effect on the species.

Platte River Species

Depletions to the Platte River system due to CDOT activities are addressed by the State of Colorado's (State) participation in the South Platte Water Related Activities Program (SPWRAP) through the "Memorandum of Agreement for Implementation and Operation of the Colorado Portion of the Platte River Recovery Implementation Plan (PRRIP)" (SPWRAP 2006). The State has made and continues to make financial and other contributions to the PRRIP. In addition, SPWRAP has created a "Class X-1" membership specifically for and limited to the State of Colorado for diversions and depletions by State agencies that are comparatively small. CDOT falls into this category because their typical depletive activities such as wetland creation and water quality ponds, as well as water used for compaction, concrete, and dust control do not generally require large amounts of water. According to the Memorandum of Agreement (MOA), contributions previously made are deemed payment of all SPWRAP assessments for the Class X-1 membership for the duration of the First Increment of the PRRIP, which expires in 2020. However, because the FHWA is funding the project, in order to satisfy their obligation under the Act, section 7 consultation is required. The proposed action is likely to extend beyond 2020; at that time, the PRRIP will be reviewed and the necessary steps will be taken to ensure compliance with the Act.

Because the amount of water used cannot be anticipated at the Programmatic level, a PRRIP template biological assessment will be submitted to the Service during site-specific analysis for streamlined section 7 consultation. This site-specific biological assessment will estimate the water usage for that particular project. Following streamlined consultation and the Service's issuance of a biological opinion, project-level depletions will be monitored annually by FHWA/CDOT and reported to the USFWS. The Platte River species will not be considered further in this document.

CONSULTATION HISTORY

Species lists were sent to CDOT and FHWA on February 20, 2004; July 14, 2005; November 22, 2006; and July 14, 2007. On February 26, 2004, a Resource Agency Scoping meeting was held. Another meeting to discuss project purpose and need, and description was held on May 11, 2005. On May 2, 2006, a Resource Agency meeting was held, and consultation needs were discussed and identified. On June 19, 2006, a project meeting was held that provided a project overview as well as discussions of impacts to listed species, wildlife in general, and movement corridors.

The final biological assessment was submitted to the Service on August 4, 2011.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed action consists of highway and transit improvements from Fort Collins south to Denver. The proposed action includes the following elements:

- **I-25 Highway Improvements:** One new general purpose lane in each direction of I-25 between State Highway (SH) 66 and SH 14; one buffer-separated tolled express lane in each direction of I-25 from the existing high occupancy vehicle/toll lanes at 84th Avenue to SH 14; rebuilding or relocating frontage roads; construction of carpool lots; and upgrades to 17 interchanges along the I-25 corridor.
- **I-25 Express Bus:** Express bus service with 13 stations along I-25, U.S. Highway 34 (US 34), and Harmony Road with service from Fort Collins and Greeley to downtown Denver, and from Fort Collins to Denver International Airport (DIA). At some locations, the express bus station would be shared with carpool lots.
- **Commuter Rail:** Commuter rail service from Fort Collins to the anticipated FasTracks North Metro end of line. Service to Denver would connect Fort Collins to Longmont and Thornton and include nine stations at numerous northern Colorado communities. The commuter rail would largely be a single track using the existing Burlington Northern Santa Fe (BNSF) Railroad generally paralleling US 287 with passing tracks at four locations. Passengers also may connect to the FasTracks northwest rail in Longmont, which will travel to Boulder.
- **US 85 Commuter Bus:** Commuter bus service with eight stations along US 85 connecting Greeley to downtown Denver. Queue jumps, allowing buses to bypass queued traffic at some signalized intersections would be included. Queue jumps are bus-only lanes that typically require modifying an intersection to provide a short lane for the bus between the right-turn lane and through lanes.
- **Other Preferred Alternative Features:** The proposed action would include retaining walls, water quality ponds, and drainage structures. Retaining walls are used to minimize impacts to sensitive areas, and drainage structures and water quality ponds are used to comply with water quality standards.

Conservation Measures

General Conservation Measures

As part of this project, the following conservation measures were proposed in the biological assessment to reduce potential for impacts to listed species:

- An integrated weed management plan will be incorporated into project design and implemented during construction to control the infestation and spread of noxious weeds.
- Visible barriers will be used to limit the area of construction.
- Construction materials will be stockpiled in bare areas rather than on top of existing vegetation in known occupied and suitable habitats.
- Construction workers will be informed of the reasons for and importance of limiting impacts to vegetated habitat outside the work area in habitats known to be occupied by listed species.
- Work will be supervised on a daily basis to ensure that conditions established by the Service are met.
- Water quality Best Management Practices will be implemented to prevent sediment loading and impacts to Colorado butterfly plant, Ute ladies'-tresses orchid, and Preble's meadow jumping mouse habitats.
- Concurrent revegetation will be implemented during construction to the maximum extent practicable.
- A report will be provided to the Service that includes photographic documentation of site conditions prior to and at the completion of construction.

Species-specific Conservation Measures

- Pre-construction habitat assessments and/or surveys for the Colorado butterfly plant will be conducted during the survey season just prior to construction, or in accordance with the Service's survey protocol at the time of construction. Should the plant occur within the construction footprint, specific conservation measures will be developed during site-specific consultation.
- Suitable Ute ladies'-tresses orchid habitat will be surveyed during the three survey seasons prior to construction, or in accordance with the Service's survey protocol at the time of construction. Should the plant occur within the construction footprint, specific conservation measures will be developed during site-specific consultation.

- CDOT's Shortgrass Prairie Initiative addresses impacts to the Colorado butterfly plant and the Ute ladies'-tresses orchid in portions of the project area. In those portions of the project area covered by the Shortgrass Prairie Initiative, no additional conservation measures for the Colorado butterfly plant or Ute ladies'-tresses orchid will be necessary provided that the Shortgrass Prairie Initiative is still in effect when construction begins.
- Pre-construction habitat assessments and/or trapping surveys for the Preble's meadow jumping mouse will be conducted where appropriate.
- Impacts to occupied Preble's meadow jumping mouse habitat at the Little Thompson and Big Thompson rivers and any areas found to be occupied by Preble's meadow jumping mouse by future surveys will be limited to their inactive season (November through April).
- If culverts in occupied or suitable Preble's meadow jumping mouse habitat are replaced or upgraded, the new culverts will incorporate ledges to facilitate small mammal passage.
- Lighting within and near Preble's meadow jumping mouse habitat will incorporate current technology and standards (e.g., Dark Skies) at the time of design to reduce lighting impacts to Preble's meadow jumping mouse.
- During construction, nighttime work within 0.25 mile of Preble's meadow jumping mouse habitat will be minimized.
- Where impacts to habitat occupied by Preble's meadow jumping mouse are unavoidable, compensatory mitigation will be provided through enhancement or replacement with suitable habitat. Permanent impacts will be mitigated at a 3:1 mitigation to impact ratio; temporary impacts will be mitigated at a 1:1 ratio. Mitigation measures for Preble's meadow jumping mouse could be combined with wetland mitigation. Wetland mitigation measures also may replace any impacts to suitable unoccupied habitat. Coordination with the Service will occur prior to mitigation implementation to determine the appropriateness of mitigation.
- Any inadvertent Preble's meadow jumping mouse mortalities during construction will be reported as specified in current trapping guidelines. CDOT will report all relevant information within 24 hours and subsequently submit a completed Injury/Mortality Documentation Report to the Service, Ecological Services Colorado Field Office or the Service's Division of Law Enforcement in Lakewood, Colorado (telephone 720 981-2777).
- In the unlikely event that a Preble's mouse (dead, injured, or otherwise) is located during construction, the Colorado Field Office of the Service will be contacted immediately to identify additional measures, as appropriate, to minimize impacts to Preble's.

ACTION AREA

The action area includes all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. [50 CFR § 402.02] It is the area containing the most far-reaching potential effects of the federal and non-federal actions on the species being discussed. The action area is defined by measurable or detectable changes in land, air, and water or to other measurable factors that will result from the proposed action. The action area is not limited to the “footprint” of the action, but rather encompasses the biotic, chemical, and physical impacts to the environment resulting directly or indirectly from the action.

The action area for the proposed project is the area that encompasses the reach of all the direct and indirect environmental impacts of the project; that is, the area in which the biotic, chemical, and physical impacts to the environment that are anticipated to occur. The action area for the north I-25 corridor is the South Platte River ecosystem.

The project area is defined as the footprint of the preferred alternative, including the highway and transit improvements summarized above. The width of the construction footprint, including existing highway right-of-way (ROW), along I-25 ranges from 230 feet at the Cache la Poudre River to about 90 feet at the St. Vrain River. This area includes both permanent disturbance, such as areas that will be paved, as well as areas along both sides that will be disturbed temporarily during construction then restored. The width of the construction footprint along the BNSF alignment from Fort Collins to Longmont is about 30 feet along sections where a single track will be constructed, 70 feet where a double track will be constructed, and about 100 feet at the Sugarmill Road site where several tracks will be constructed. In many cases, construction impacts will be limited; often passenger rail will be added to the existing freight rail track. From Longmont to the North Metro area, new rail construction will require grading and construction of retaining walls to minimize disturbance to sensitive resources. The width of the construction footprint along this portion of the alignment ranges from 35 to 150 feet. The width of the construction footprint at the St. Vrain River at SH 119, where two tracks would be constructed, is anticipated to be approximately 90 feet.

The area indirectly affected by the action is that area affected by sedimentation, snow and ice control and removal, weed control, noise, and severed connectivity. Sedimentation, snow plowing and de-icers, and herbicides degrade water quality adjacent to and downstream of the application site. Construction and maintenance operations and traffic create noise and increase human and vehicular activity which may deter wildlife from using habitats adjacent to the roadway.

STATUS OF THE SPECIES/CRITICAL HABITAT DESCRIPTION

Preble's meadow jumping mouse

The Preble's meadow jumping mouse is a member of the family Dipodidae (jumping mice) with four living genera, two of which, *Zapus* and *Napaezapus*, 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 (Krutzsch 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 added the Preble's meadow jumping mouse to the List of Endangered and Threatened Wildlife in 50 CFR 17.11 as a threatened species on May 13, 1998 (63 FR 26517). The Service revised designated critical habitat for Preble's in 50 CFR Part 17 on December 15, 2010 (75 FR 78429). Critical habitat for Preble's includes approximately 411 miles (662 km) of rivers and streams and 34,935 acres (14,138 ha) 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.

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 are a pattern of dense riparian vegetation consisting of grasses, forbs, and shrubs, and open water; adjacent floodplains and vegetated uplands with limited human disturbance; areas that provide connectivity between and within populations, and; dynamic geomorphological and hydrological processes that create and maintain river and stream channels, floodplains, and floodplain benches, and promote patterns of vegetation favorable to Preble's.

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.

Activities with the potential for altering the 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, and; activities that could lead to the introduction, expansion, or increased density of exotic plant or animal species detrimental to Preble's and its habitat.

The Service used the Recovery Team's Draft Discussion Document of February 27, 2002 (Working Draft), and the concepts described within it as a source of the best scientific and commercial data available on Preble's, and also used it as a starting point for identifying areas that are essential for the conservation of Preble's. To recover Preble's to the point where it can be delisted, the Working Draft identifies the need for a specified number, size, and distribution of wild, self-sustaining Preble's populations across its known range.

The Working Draft identifies recovery criteria for two Recovery Units where Preble's occurs: the North Recovery Unit and the South Recovery Unit. The Recovery Units are roughly separated by the Denver Metropolitan area. The Working Draft uses 8-digit HUC boundaries to define subdrainages, and identifies 13 HUCs as occupied or potentially occupied. Of these, six are located in the North Recovery Unit, and seven are located in the South Recovery Unit. Further, the Working Draft defines large populations as maintaining 2,500 mice and usually including at least 50 miles of rivers and streams. Medium populations maintain 500 mice over at least 10 miles of rivers and streams, and small populations maintain 150 mice over 3 miles of stream. In addition, the Working Draft calls for one large and two medium populations in three separate HUCs, as well as three small populations within each of the remaining three HUCs within the North Recovery Unit, and one large population and two medium populations in three separate HUCs, as well as three small populations in each of the remaining four HUCs within the South Recovery Unit. We are currently in the process of updating the Working Draft.

Life History

Habitat

Typical habitat for Preble's meadow jumping mouse is composed 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 Grunau 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.), Gamble's oak, thistle (*Cirsium* spp.), and alyssum (*Alyssum* spp.) (Shenk and Sivert 1999a). At the Air Force Academy near Colorado Springs, 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 south of Boulder, 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*), red fox (*Vulpes vulpes*), gray fox (*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, seeds, 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 (USFWS 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 (USFWS 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 protection 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.

On December 15, 2010, Critical Habitat was re-designated but the designation does not include the project area.

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.

The project area is located along the base of the eastern foothills of the Rocky Mountains in the Great Plains ecosystem. Wildlife habitat in the project area is fragmented by urban development, cultivated fields, and numerous roads and highways. Protected open space and other undeveloped land is scattered throughout the project area. Wildlife species present include mule deer (*Odocoileus hemionus*), elk (*Cervus elaphus*), white-tailed deer (*Odocoileus virginianus*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), red fox (*Vulpes vulpes*), and striped skunk (*Mephitis mephitis*). A variety of small mammals and birds also occur in the project area.

Land uses in the project area consist primarily of agricultural land (irrigated and nonirrigated), urban areas, and developed areas, and is dominated by non-native plants. Roadside vegetation is dominated by species typical of disturbed sites such as kochia (*Bassia scoparia*), barnyard grass (*Echinochloa crus-galli*), and western wheatgrass (*Pascopyrum smithii*). Vegetation in residential and commercial development consists of bluegrass lawns and ornamental trees and shrubs. Narrow bands of riparian vegetation are present along streams and irrigation canals. Common trees in riparian areas include plains cottonwood (*Populus deltoides*), Siberian elm (*Ulmus pumila*), and Russian olive (*Elaeagnus angustifolia*). Wetland species typically include sandbar willow (*Salix exigua*), cattail (*Typha* sp.), reed canarygrass (*Phalaroides arundinacea*), sedges (*Carex* spp.), rushes (*Juncus* spp.), reedtop (*Agrostis stolonifera*), and curly dock (*Rumex crispus*). The highway and railroad ROWs consist mostly of mowed or unmowed grasslands with riparian trees and shrubs along major drainages. Outside the ROWs, the surrounding land is mostly privately-owned irrigated cropland, nonirrigated cropland, and commercial development. Some land along SH 119 is publicly-owned open space.

Major drainages crossing the project area run in an easterly direction and include, from north to south, the Cache la Poudre River, Fossil Creek, Big Thompson River, Little Thompson River, St. Vrain River, Little Dry Creek, Big Dry Creek, and the South Platte River. Vegetation along

these drainages is typically dominated by cattail, sandbar willow, reed canarygrass, plains cottonwood, Russian olive, and Siberian elm.

Preble's meadow jumping mouse

Status of the Preble's meadow jumping mouse Within the Action Area

In the project area, Preble's meadow jumping mouse is known to occur along South Boulder Creek, the Big Thompson River, the Little Thompson River, and the South Platte River downstream of the confluence with the Big Thompson River. Habitat assessments were conducted on April 18 and 22, 2005; August 31, 2005; and September 16, 2008, in all drainages where project activities are expected to occur. Trapping data for several drainages were also reviewed, and there have been no captures in the project area, but captures have been documented nearby. These drainages include the Cache la Poudre River, Fossil Creek, Big Thompson River, Little Thompson River, St. Vrain River, Spring Creek, Little Dry Creek, Big Dry Creek, and the South Platte River. At both the Little Thompson and Big Thompson rivers, Preble's meadow jumping mice have been captured within approximately one mile downstream of their intersection with I-25, though no mice have been captured at I-25, within the impact area. Because of this, these sites are possible movement corridors although they are unlikely to support a population. Additionally, all four drainages have been trapped extensively upstream of I-25, and Preble's meadow jumping mice have been documented above the urbanized areas on all drainages except the Little Thompson. All sites will be reassessed prior to construction.

In the time since the listing of Preble's, May 1998, through September 2011, we have conducted 145 formal consultations pursuant to section 7 of the ESA and issued 21 incidental take permits pursuant to section 10(a)(1)(B) of the ESA regarding Preble's in Colorado. Table 1 summarizes the total acres of habitat loss exempted or incidental take permitted by the Service through these actions.

Table 1 - Total acres of permanent and temporary Preble's habitat loss exempted or incidental take permitted by the Service under the ESA between May 1998 and September 2011.

* The total acres of permanent and temporary take exempted under section 10 does not include the Livermore Habitat Conservation Plan (HCP) in Larimer County, Colorado, completed in January 2004. As of July 2011, there are no enrollments in the Livermore HCP.

Regulatory Authority of the ESA	Number of Exemptions or Permits	Permanent Take (acres)	Temporary Take (acres)
Section 7 (Federal consultations)	145	463	1245
Section 10 (non-Federal consultations)	21	426 *	270*
TOTAL =	166	889	1,515

In the Big Thompson, Little Thompson, Cache la Poudre, and St. Vrain rivers, we have exempted or permitted incidental take of Preble's for approximately 55 acres of permanent

habitat loss and approximately 295 acres of temporary habitat loss. These permits or exemptions required mitigation, habitat enhancement, and post-implementation monitoring.

Factors Affecting the Environment of the Preble's meadow jumping mouse Within the Action Area

Creeks and streams directly adjacent to and crossing I-25 have been moved and channelized in order to accommodate the highway, which has resulted in a loss of riparian vegetation and an alteration in hydrology. Adjacent development has not only directly removed habitat, but it has also further altered the timing and amount of flows which can lead to downcutting and loss of riparian habitat. Culverts that convey streams beneath I-25 and bridges constructed over I-25 oftentimes were not constructed to allow for wildlife passage, thus they fragment habitat for many riparian-dependent species such as the Preble's meadow jumping mouse. Highway winter maintenance activities such as sand and de-icer application have likely altered the water chemistry of adjacent creeks. Nearby vegetation has potentially been affected, as well, through mowing, burying with sand, or spraying with de-icers. In addition, much of the property along I-25 is grazed, which, if not properly managed, can degrade or destroy the Preble's meadow jumping mouse's riparian habitat.

EFFECTS OF ACTION

Habitat Loss

Habitat for the Preble's meadow jumping mouse is defined as stream and riparian habitats within 300 feet of the 100-year floodplain. For impact calculation, suitable habitat was treated the same as occupied habitat, and all impacts are considered to be permanent. Calculations will be refined during site-specific consultation.

The width of the construction footprint, including existing highway ROW, along I-25 ranges from 230 feet at the Cache la Poudre River to about 90 feet at the St. Vrain River. This area includes both permanent disturbance such as areas that will be paved, and areas along both sides that will be disturbed temporarily during construction then restored. The width of the construction footprint along the BNSF alignment from Fort Collins to Longmont is approximately 30 feet along sections where a single track will be constructed, 70 feet where a double track will be constructed, and about 100 feet at the Sugarmill Road site where several tracks will be constructed. In many cases, construction impacts will be limited; often passenger rail will be added to the existing freight rail track. From Longmont to the North Metro area, new rail construction will require grading and construction of retaining walls to minimize disturbance to sensitive resources. The width of the construction footprint along this portion of the alignment ranges from 35 to 150 feet. The width of the construction footprint at the St. Vrain River at SH 119, where two tracks will be constructed, will be about 90 feet.

The proposed construction activities will affect Preble's meadow jumping mouse and their habitat. At this time, all impacts are considered to be permanent, but will be refined during site-specific consultation. The highway widening components will disturb approximately 0.72 acre

of occupied Preble's meadow jumping mouse habitat at the Big Thompson and Little Thompson rivers, and 1.21 acres of suitable habitat at the Cache la Poudre and St. Vrain rivers. Transit components of the project will not affect currently-occupied habitat; however, suitable habitat is present along several drainages crossed by the proposed commuter rail alignment.

Approximately 0.06 acre of suitable habitat will be affected at the St. Vrain River at SH 119, and 0.08 acre at the Big Thompson River and the BNSF alignment.

Permanent and temporary habitat loss would deprive the mouse of forage material, would expose them to predation, disrupt or destroy hibernacula, and may inhibit dispersal under the highway by forcing mice to cross exposed areas. Additionally, shrubs and bushes would potentially be removed from the upland adjacent to riparian areas, which may deprive Preble's of day roosts, hibernacula, and forage material, and potentially expose them to predation. In addition, mice could be killed by construction equipment or workers by either being crushed or smothered. Conservation measures will reduce the likelihood of take due to construction activities.

All temporarily affected habitat will be restored at a 1:1 ratio. Any Preble's habitat permanently removed due to project activities will be replaced at a 3:1 ratio. Habitat impacts will be recalculated and separated into temporary or permanent and a restoration plan will be developed during site-specific consultation.

Light and Noise

Lights, noise, and human activity during construction could alter foraging, sheltering, and breeding activities of the Preble's meadow jumping mouse. Even though these impacts are temporary, it is probable that the species will avoid the area if possible during these activities. Disturbances to Preble's and their habitat may affect breeding behavior, dispersal ability, and susceptibility to predation. Such effects are difficult to quantify, but were considered during consultation.

Implementation of conservation measures will minimize the effects of lights and activity on the species. Using only the lighting necessary and focusing it on the work area will also lessen their impact on the Preble's meadow jumping mouse to some degree.

Sedimentation

Highway construction will temporarily expose bare soil making it susceptible to entering creeks and streams and smothering riparian areas. Erosion control BMPs will be implemented to minimize or prevent sediment from reaching adjacent waterways.

Habitat Fragmentation

Although the project will result in alteration and loss of Preble's habitat, the project will not cause permanent habitat fragmentation and loss of connectivity within and between populations in the project area once construction and restoration are complete. Habitat connectivity and mouse mobility will improve at the project site once all conservation measures are implemented.

Winter Maintenance

Changes in water quality or chemistry due to annual herbicide roadside applications for controlling noxious weeds, as well as winter sanding, salting, and de-icing agents added to the roadways could affect downstream riparian habitat. Herbicide, salt and de-icing agents would be expected to dilute enough to limit their effects on riparian vegetation; however, an increase in sediment entering the river system due to construction activities could be expected to alter Preble's meadow jumping mouse habitat in downstream locations. Alteration of habitat could lead to some mortality of individuals and limit their dispersal.

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.

Population Growth

Future development and related infrastructure are likely the most serious threats to any Preble's populations in or near the regional study area. Ryon (1996) found that Preble's were no longer present at many sites where they had previously been trapped, including near Longmont within the regional study area, probably due to the urban and industrial development that has occurred. Increased development in the regional study area will result in habitat loss, increased traffic volumes, increased noise and air pollution, increased human activity, and a greater number of domestic pets, plants, and livestock.

Activities associated with urban development may also degrade Preble's habitat and disrupt movement corridors. Increased human activity, including noise and air pollution from machinery, may discourage use of habitat. Human activity and associated development may constrain wildlife travel between adjacent blocks of habitat. Any increase in residential development likely will increase the number of domestic cats and dogs in areas adjacent to Preble's habitat, which may increase predation of Preble's. Additional growth could also result in more impervious surface which could lead to altered stream flows, downcutting of streams, and loss of riparian habitat that supports the Preble's meadow jumping mouse. In addition, an increase in population could lead to an increase in social trails along creeks and streams, people requiring fishing and boating access, and introduction of noxious weeds to riparian areas.

Portions of the regional study area also have infestations of nonnative and noxious weeds, including diffuse knapweed and Canada thistle. Noxious weeds do not pose a significant threat to Preble's habitat but may reduce the amount of desirable forage and cover.

Future land use mapping at the Big Thompson River crossing shows planned residential and commercial development south of the Big Thompson River at I-25; however, the land

surrounding the river is largely within the Big Thompson Ponds State Wildlife Area west of I-25, and the agricultural land east of I-25 is likely to remain undeveloped according to the mapping. Future land uses are unlikely to make this reach of the Big Thompson River unsuitable as a movement corridor for Preble's. At the Little Thompson River, some residential development is expected south of the Little Thompson River, but in general, the surrounding land use is expected to remain agricultural. Riparian habitat near the Little Thompson River will likely remain suitable as a Preble's movement corridor.

Climate Change

According to the Intergovernmental Panel on Climate Change (IPCC 2007b), "Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level." Average Northern Hemisphere temperatures during the second half of the 20th century were very likely higher than during any other 50-year period in the last 500 years and likely the highest in at least the past 1,300 years (IPCC 2007b). It is very likely that over the past 50 years, cold days, cold nights, and frosts have become less frequent over most land areas, and hot days and hot nights have become more frequent (IPCC 2007b). It is likely that heat waves have become more frequent over most land areas, and the frequency of heavy precipitation events has increased over most areas (IPCC 2007b).

The IPCC (2007b) predicts that changes in the global climate system during the 21st century are very likely to be larger than those observed during the 20th century. For the next two decades, a warming of about 0.2 °C per decade is projected (IPCC 2007b). Afterwards, temperature projections increasingly depend on specific emission scenarios (IPCC 2007b). Various emissions scenarios suggest that by the end of the 21st century, average global temperatures are expected to increase 0.6 to 4.0 °C with the greatest warming expected over land (IPCC 2007b). Localized projections suggest the southwest may experience the greatest temperature increase of any area in the lower 48 States (IPCC 2007b). The IPCC predicts that it is very likely hot extremes, heat waves, and heavy precipitation will increase in frequency (IPCC 2007c). There also is high confidence that many semi-arid areas like the western United States will suffer a decrease in water resources due to climate change (IPCC 2007b). Milly et al. (2005) project a 10 to 30 percent decrease in precipitation in mid-latitude western North America by the year 2050 based on an ensemble of 12 climate models.

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 2007a). 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 2007a). 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

Jeopardize the continued existence of, is defined as, to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR § 402.02).

Recovery calls for improvement in the status of listed species to the point at which listing is no longer appropriate under the criteria set out in section 4(a)(1) of the Act (50 CFR § 402.02).

After reviewing the current status of the affected species, the environmental baseline for the action area, the effects of the proposed action 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 the Preble's meadow jumping mouse. Although Critical Habitat has been designated for the species, none occurs in the project area.

Based on the amount and nature of project impacts, the project will have temporary but not significant long term effects on the ability of Preble's to travel upstream or downstream along the creek corridor within the project areas, or on the creeks' hydrologic regimes, including their ability to support riparian vegetation. Given the conservation measures proposed, over time temporarily disturbed Preble's habitat should return to a condition as good as that which is currently present, and its maintenance as good habitat will be assured. Habitat connectivity is likely a greater conservation concern than habitat loss at the project location and implementation of conservation measures should improve connectivity under I-25.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to 4(d) of the Act prohibit the take of endangered and threatened animals, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of 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 FHWA so that they become binding conditions of any project approval issued to CDOT for the exemption in section 7(o)(2) to apply. The FHWA has the continuing duty to regulate the activity covered by this incidental take statement. If the FHWA fails (1) to assume and implement the terms and conditions or (2) fails to require CDOT to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the project approval, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, CDOT must report the progress of the action or its impact on the species to the Service as specified in the incidental take statement.

AMOUNT OR EXTENT OF TAKE

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 combined permanent and temporary loss of no more than 2.07 acres of Preble's habitat. Take due to habitat fragmentation is not expected due the implementation of conservation measures to improve connectivity under I-25.

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that the level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of its designated critical habitat. Implementation of improvements to the north I-25 corridor and its Conservation Measures will not appreciably reduce Preble's meadow jumping mouse in the South Platte drainage. Although habitat will be permanently lost to the highway footprint, proposed conservation measures are likely to improve connectivity along the Big Thompson and Little Thompson rivers thus facilitating genetic exchange across the highway, and improving population fitness.

REASONABLE AND PRUDENT MEASURES

The reasonable and prudent measures, and implementing terms and conditions are designed to minimize the effects of incidental take that might otherwise result from the action. In addition to the Conservation Measures already proposed as part of the project description, the Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of the Preble's meadow jumping mouse:

1. FHWA/CDOT will monitor and report on the progress of implementation of the proposed action including all conservation measures.

2. FHWA/CDOT will monitor all temporarily disturbed sites.

TERMS AND CONDITIONS

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

1. As individual projects are proposed under the programmatic consultation, FHWA will provide the Service with project-specific information that includes 1) a description of the proposed action, including specific proposed conservation measures, and the area to be affected, 2) the species that may be affected and their known proximity to the project area, 3) results of habitat assessments and species surveys, 4) an updated baseline of the specific project area, 5) a description of how the action may affect the species, 6) a determination of effects, 7) a cumulative total of incidental take that has occurred to date under the consultation, 8) a description of any additional actions or effects not considered in this programmatic consultation, and 9) a description of conservation measures or mitigation activities already implemented and their effectiveness.
2. During site-specific consultation, CDOT and FHWA will develop revegetation success criteria in coordination with the Service and will monitor revegetated sites to ensure that those success criteria are achieved.

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.

REINITIATION NOTICE

This concludes formal consultation on proposed Federal actions related to the construction of improvements to the I-25 Corridor between Denver and Fort Collins, Colorado. As required by 50 CFR 402.16, reinitiation of formal consultation is required if (1) the amount or extent of incidental take is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion, (3) the agency action is subsequently modified in a manner that causes an adverse effect to the listed species or critical habitat that was not considered in this opinion, (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where incidental take exceeds the authorized, any operations causing such take must cease pending reinitiation. In

addition, if the Term and Condition is not met, reinitiation of formal consultation will become necessary.

If the Service can be of further assistance, please contact Alison Deans Michael of my staff at (303) 236-4758.

Sincerely,



Susan C. Linner
Colorado Field Supervisor

ec: FHWA (Monica Pavlik)
CDOT, HQ (Jeff Peterson)
CDOT, R4 (Carol Parr)
Michael

LITERATURE CITED

- Bakeman, M.E. 1997. Conclusions and recommendations from the report on habitat findings of the Preble's meadow jumping mouse. Unpublished report to the U.S. Fish and Wildlife Service and the Colorado Division of Wildlife. 13 pp. + tables and figures.
- Bakeman, M.E. and A. Deans. 1997. Habitat of the Preble's meadow jumping mouse at Rocky Flats, Colorado. Pp. 19-35 in Report on habitat findings on the Preble's meadow jumping mouse (ed. M. Bakeman). Unpublished report to the U.S. Fish and Wildlife Service and the Colorado Division of Wildlife. 91 pp.
- Beauvais, G.P. 2001. Preble's meadow jumping mouse (*Zapus hudsonius preblei*) in Wyoming: Status report, July 2001. Unpublished report of the Wyoming Natural Diversity Database. 13 pp.
- Clark, T.W. and M.R. Stromberg. 1987. Mammals in Wyoming. University of Kansas Museum, Lawrence, Kansas. 314 pp.
- Compton, S.A. and R.D. Hugie. 1993. Status report on *Zapus hudsonius preblei*, a candidate endangered species. Pioneer Environmental Services, Inc. Report submitted to U.S. Fish and Wildlife Service. Logan, Utah. 32 pp.
- Corn, J.G., C.A. Pague, A.R. Ellingson, M. Sherman, T. Zwięjacz, G. Kittel, and C. Fleming. 1995. Final report on the geographic extent of the Preble's meadow jumping mouse population on the United States Air Force Academy. Presented to the U.S. Air Force Academy. 44 pp.
- Dharman, A.T. 2001. Movement patterns of Preble's meadow jumping mouse. M.S. Thesis. Colorado State University, Fort Collins, Colorado.
- Fitzgerald, J.P., C.A. Meaney, and D.M. Armstrong. 1994. Mammals of Colorado. University Press of Colorado, Niwot. 467 pp.
- Hafner, D.J., E. Yensen, and G.L. Kirkland, Jr. (eds.). 1998. North American rodents: status survey and conservation action plan. International Union for the Conservation of Nature and Natural Resources, Gland, Switzerland. 171 pp.
- Hafner, D.J., K.E. Petersen, and T.L. Yates. 1981. Evolutionary relationships of jumping mice (*Genus Zapus*) of the southwestern United States. *Journal of Mammalogy* 62:501-512.
- Hall, E.R. 1981. The Mammals of North America. John Wiley and Sons, Inc., New York. 1181 pp.
- Hurd, B., N. Leary, R. Jones, and J. Smith. 1999. Relative regional vulnerability of water resources to climate change. *Journal of the American Water Resources Association* 35:1399-1409
- IPCC. 2007a: Summary for Policymakers. In: *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 7-22.
- IPCC. 2007b. *Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, Pachauri, R.K and Reisinger, A. (eds.)]. IPCC, Geneva, Switzerland, 104 pp.

- Kaufman, D.W., E.J. Finch, and G.A. Kaufman. 1990. Small mammals and grassland fires. pp. 46-80 in *Fire in North American tallgrass prairies* (S. L. Collins and L. L. Wallace, eds.). University of Oklahoma Press, Norman, OK.
- Keinath, D.A. 2001. Habitat associations of Preble's meadow jumping mice in Wyoming: A GIS model and descriptive analysis. Report prepared for U. S. Fish and Wildlife Service, Cheyenne, Wyoming. Prepared by Wyoming Natural Diversity Database, University of Wyoming, Laramie, Wyoming.
- Krutzsch, P.H. 1954. North American jumping mice (genus *Zapus*). University of Kansas Publications, Museum of Natural History 7:349-472.
- Meaney, C., A. Ruggles, N.W. Clippinger, and B. Lubow. 2002. The impact of recreational trails and grazing on small mammals in the Colorado Piedmont. *The Prairie Naturalist* 34:3-4.
- Meaney, C.A., A. Ruggles, C. Ahrens, and C. Ruggles. 2001. Survey for Preble's meadow jumping mice, Trout Creek at Rainbow Falls, Manitou Experimental Forest, Pike National Forest. Unpublished report prepared for Pike & San Isabel National Forest, Pikes Peak Ranger District, Colorado Springs.
- Milly, P.C.D., K.A. Dunne, and A.V. Vecchia. 2005. Global pattern of trends in streamflow and water availability in a changing climate. *Nature* 438:347-350.
- Pague, C.A. and L. Grunau. 2000. Conservation planning handbook for the Preble's meadow jumping mouse (*Zapus hudsonius preblei*). Unpublished report to the Colorado Department of Natural Resources. 44 pp.
- Preble, E.A. 1899. Revision of the jumping mice of the genus *Zapus*. U.S. Department of Agriculture, North American Fauna 15:1-41.
- Quimby, D.C. 1951. The life history and ecology of the jumping mouse, *Zapus hudsonius*. *Ecological Monographs* 21:61-95.
- Ryon, T.R. 1996. Evaluation of the historic capture sites of the Preble's meadow jumping mouse in Colorado. MS thesis, University of Colorado, Denver. 65 pp.
- Ryon, T.R. 1999. Travel distance and movement patterns of the Preble's meadow jumping mouse (*Zapus hudsonius preblei*) at the Rocky Flats Environmental Technology Site. *Journal of Colorado-Wyoming Academy of Science* 31:12.
- Ryon, T.R. 2001. Summer nests of the Preble's meadow jumping mouse. *Southwestern Naturalist* 46 (3): 376-378.
- Schorr, R.A. 2001. Meadow jumping mice (*Zapus hudsonius preblei*) on the U.S. Air Force Academy, El Paso County, Colorado. Colorado Natural Heritage Program, Unpublished report to the Natural Resources Branch, U.S. Air Force Academy. 55 pp.
- Shenk, T. 1998. Conservation assessment and preliminary conservation strategy for Preble's meadow jumping mouse (*Zapus hudsonius preblei*). Fort Collins (CO): Colorado Division of Wildlife. 38 pp.
- Shenk, T.M. and J.T. Eussen. 1998. Habitat use and distribution of Preble's meadow jumping mouse (*Zapus hudsonius preblei*) in Larimer and Weld counties, Colorado. Unpublished report of the Colorado Division of Wildlife. 25 pp. + figures.
- Shenk, T. and M. Sivert. 1999a. Movement patterns of Preble's meadow jumping mouse (*Zapus hudsonius preblei*) as they vary across time and space. Fort Collins (CO): Colorado Division of Wildlife. 35 pp.

- Shenk, T.M. and M.M. Sivert. 1999b. Temporal and spatial variation in the demography of Preble's meadow jumping mouse (*Zapus hudsonius preblei*). Unpublished report of the Colorado Division of Wildlife. 16 pp.
- SPWRAP. 2006. Memorandum of Agreement for Implementation and Operation of the Colorado Portion of the Platte River Recovery Implementation Plan. Signed by the State of Colorado, Department of Natural Resources and the South Platte Water-Related Activities Program, Inc. November 17, 2006.
- U.S. Fish and Wildlife Service. 1998a. Final rule to list the Preble's meadow jumping mouse as a threatened species. Federal Register 63(92):26517-26530.
- Whitaker, J.O., Jr. 1963. A study of meadow jumping mouse, *Zapus hudsonius* (Zimmerman), in central New York. Ecological Monographs 33:215-254.
- White, G.D. and T.M. Shenk. 2000. Relationship of Preble's meadow jumping mouse densities to vegetation cover. Report to the Colorado Division of Wildlife. 13 pp.