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**APPENDIX F**  
**BIOLOGICAL OPINION**

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## United States Department of the Interior

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

IN REPLY REFER TO:  
ES/CO: ES/LK-6-CO-10-F-003  
TAILS: 65412-2010-F-0019

December 9, 2009

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

Dear Ms. Petty:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological and conference opinions on multi-modal transportation improvements along U.S. Highway 36 (US36) between Interstate 25 (I-25) in Denver and the Table Mesa Drive/Foothills Parkway exit in Boulder, Colorado, and its effects on the federally-threatened Preble's meadow jumping mouse (*Zapus hudsonius preblei*) (Preble's) and its proposed critical habitat, the Ute ladies'-tresses orchid (*Spiranthes diluvialis*) (orchid), and the Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*) (butterfly plant). The proposed project encompasses a number of communities in the northwest Denver metropolitan area including the City and County of Denver, the City of Westminster, the City and County of Broomfield, the City of Louisville, the Town of Superior, the City of Boulder, Boulder County, and portions of unincorporated Adams, Jefferson, and Boulder Counties. These biological and conference opinions are provided in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). They are based on the document "US 36 Corridor, Final Environmental Impact Statement/Final Section 4(f) Evaluation, Programmatic Biological Assessment," (biological assessment) and on subsequent emails and conversations. Your request for formal consultation was received by the Service on October 20, 2009. The proposed project will be constructed by the Colorado Department of Transportation (CDOT) with the participation and funding of the Federal Highway Administration (FHWA). We concur with your conclusion that the proposed work is likely to adversely affect Preble's and the orchid.

Further, the Service finds that the proposed action is not likely to adversely affect the Colorado butterfly plant because although potential habitat occurs within the project area, the butterfly plant is not known to occur there. Because project implementation will not occur for several years, CDOT will conduct surveys for the plant in appropriate habitat prior to construction and formal consultation will occur if necessary. The species will not be considered further in these biological and conference opinions.

## CONSULTATION HISTORY

On May 13, 1998, Preble's was listed as threatened under the Endangered Species Act. Full protection for Preble's became effective on June 12, 1998. On June 23, 2003, critical habitat for Preble's was designated, and on October 8, 2009, it was re-proposed and includes South Boulder Creek and its floodplain. On July 10, 2008, Preble's was delisted in the Wyoming portion of its range, but retains its threatened status in Colorado. Trapping surveys have documented Preble's along drainages in the South Boulder Creek floodplain including South Boulder Creek, Goodhue Ditch, and Davidson Ditch.

The Ute ladies'-tresses orchid was listed as threatened in 1992. No critical habitat was designated for the species at the time of listing. In 1995, the Service implemented a recovery plan for delisting the species, and in 2004, we initiated a status review to determine if delisting the Ute ladies'-tresses orchid was warranted based on new information on population sizes, distribution, and increased knowledge of its life history and habitat requirements

On June 17, 2004, CDOT and URS met with the Service to review threatened and endangered species, survey requirements, and mitigation. The group reviewed each riparian crossing within the project area and made conclusions on the need for Preble's meadow jumping mouse trapping surveys at some locations where presence of the species is unknown. None of the riparian crossings along US36 were recommended for trapping.

In July 2006, CDOT, the Service, and URS conducted a field review of habitat conditions at several locations in the vicinity of South Boulder Creek on US36 that are classified as occupied habitat by the Colorado Division of Wildlife's Natural Diversity Information Source (NDIS). Based on the field review, areas between riparian corridors that NDIS classified as unoccupied habitat were determined to be suitable habitat for Preble's, therefore; the impact evaluation in the biological assessment included these areas as potentially occupied habitat. However, a University of Colorado property on the western end of the project area that NDIS classifies as occupied habitat was not considered to be Preble's habitat in the biological assessment based on the field review, as well as negative Preble's trapping records and evaluations.

CDOT, the Service, FHWA, URS, City of Boulder Open Space and Mountain Parks (OSMP), and Boulder County Open Space met on August 23, 2006, to discuss mitigation goals and opportunities for Preble's and the orchid. CDOT asked City of Boulder OSMP and Boulder County Open Space to identify properties in need of enhancement, restoration, creation, or preservation and are located within or adjacent to open space that would provide mitigation by improving linkages within the floodplain (on- and off-site) for populations of Preble's and the orchid.

On October 6, 2006, City of Boulder OSMP provided a memorandum that identified six sites with potential to meet the mitigation needs of the project. City of Boulder OSMP, CDOT, and

URS discussed these six sites in more detail in a telephone conference on September 28, 2006. CDOT, the Service, City of Boulder OSMP, and URS visited the sites on October 11, 2006.

On October 2, 2006, CDOT and URS discussed three additional potential mitigation sites identified on Boulder County Open Space property in a phone conference. On October 23, 2006, CDOT, the Service, Boulder County Open Space, and URS visited the three sites.

In December 2008, CDOT met with the Service to discuss the Service's comments on the draft biological assessment and to move forward to finalize it.

On July 3, 2009, the City of Boulder OSMP made it clear in a telephone conversation with CDOT as well as in their comments on the Draft Environmental Impact Statement that they strongly support an ecological approach to impact mitigation that includes mitigation sites in the South Boulder Creek floodplain where the impact occurs. This comment prompted the addition of a general mitigation "site" that includes other sites not yet identified in the South Boulder Creek floodplain as other possible locations to consider for mitigation. These sites will be negotiated with the various Boulder and regulatory agencies during site-specific consultation.

The programmatic biological assessment was received by the Service on October 20, 2009. On November 4, 2009, the Service wrote an email to you indicating that Critical Habitat had been proposed in the project area, and that Conferencing would also need to occur. As a result, on December 1, 2009, CDOT calculated impacts and conducted an analysis of the project's effect to the proposed critical habitat. These impacts will be re-evaluated during site-specific consultation.

## **BIOLOGICAL AND CONFERENCE OPINIONS**

These biological and conference opinions are based on information regarding Preble's and its proposed critical habitat, the orchid, conditions forming the environmental baseline, the importance of the project area to the survival and recovery of the species, and other sources of information as described below. The data used in this biological opinion constitute the best scientific and commercial information currently available.

## **DESCRIPTION OF THE PROPOSED ACTION**

The proposed project will provide multi-modal transportation improvements along US36 between I-25 in Denver and the Table Mesa/South Boulder Road exit in Boulder. In general, one managed lane will be added in each direction on US36 as well as auxiliary lanes between most interchanges. The managed lanes will connect to and be an extension of the existing I-25 express lanes that go to and from downtown Denver. The reversible managed lane between Sheridan Boulevard and Pecos Street will remain and traffic will continue to use the existing I-25/US36 managed lane ramp. The managed lanes from Pecos Street to west of Cherryvale Road in Boulder will be one lane in each direction, located adjacent to the median of US36, and separated

from the general-purpose lanes by a painted buffer. Buses will exit the highway to pick up and drop off passengers at stations located on ramps and adjacent park-n-Rides. Access to the managed lane will be provided at separate ingress and egress points located between each interchange.

Roadway changes will include improvements to cross-street intersections and interchanges. Those improvements will include upgrading lane transitions of ramp terminals, widening cross-streets at intersections, lengthening turn lanes, and adding turn lanes. The proposed project also includes a bikeway facility adjacent to US36. In general, the bikeway is an off-street, separated, multi-use path adjacent to US36. Where appropriate, the bikeway connects to and makes use of existing on- and off-street facilities. Transportation Demand Management (TDM) improvements throughout the corridor are also proposed, such as strategies designed to make the most efficient use of existing transportation facilities by reducing the actual demand placed on these facilities. Finally, the project will provide bus rapid transit (BRT) improvements, including new and more frequent bus service in the US36 corridor.

In addition to a new managed lane, corridor stakeholders, including the City of Boulder and Boulder County, agreed on the need for one new climbing lane in each direction, extending westbound from McCaslin Boulevard and eastbound from Foothills Parkway/Table Mesa Drive to the top of Davidson Mesa. They also agreed that the extension of these climbing lanes on US36 between McCaslin Boulevard and Table Mesa Drive (i.e., eastbound from the top of Davidson Mesa to McCaslin Boulevard and westbound from the top of Davidson Mesa to Table Mesa Drive) would become bus-only lanes, and would be constructed only if certain “triggers” are met.

While the traffic analysis indicates a need for this lane by 2035, it is unclear at what point in the future the lane would become necessary. Therefore, triggers to assist in establishing the appropriate time for construction of this lane have been established and agreed upon by a committee of stakeholders along the corridor only after a re-analysis process has been completed, and only after the Phase I improvements (one managed lane in each direction and bikeway elements) and climbing lanes have been constructed. The triggers for considering the bus-only auxiliary lane include:

- Degradation of average peak period bus travel times along US36 in the segment between the existing McCaslin park-n-Ride and Table Mesa park-n-Ride due to persistent congestion. This degradation is defined in the PEIS.
- Degradation of average peak period bus travel times resulting from congestion on US36 along South Boulder Road between the Table Mesa park-n-Ride and McCaslin Boulevard. Again, this degradation is defined in the PEIS.
- Degradation of average peak period bus travel times resulting from congestion on US36 for bus Route 228 along McCaslin Boulevard between the McCaslin park-n-Ride at US36 and South Boulder Road due to persistent congestion. This degradation is also defined in the PEIS.

It is expected that the above triggers will be measured during normal monitoring cycles by RTD, CDOT, or the local agencies that have responsibility for these routes or modes so that extra efforts to monitor these triggers will not be necessary. At a minimum, the above triggers will be looked at when traffic numbers require updating during re-evaluation processes. If a trigger is met, a re-analysis process will be initiated and will include all US36 communities along with FHWA, CDOT, and RTD representatives to develop and evaluate methods to improve bus operations.

When a trigger is met, some action will first be taken to improve transit operations. Should actions other than construction of the bus-only auxiliary lane occur and the triggers are met again, re-analysis will be re-initiated as necessary. The most cost-effective and practical alternatives would be implemented. Full public and agency involvement will be included in this re-analysis process. The construction of the bus-only auxiliary lane will not commence until approved. Acquisition of any additional ROW required for the bus-only auxiliary lanes will not take place until the re-analysis is complete and the lanes approved.

Shoulders cannot be used for transit operations or bus travel because FHWA typically does not allow the long-term use of shoulders for buses or other vehicles because they are intended to be used for emergencies.

Funding to implement the entire project is not currently available, however; as funds become available, it is FHWA/CDOT's intent to fully implement the project through a phased approach. If state and/or federal funds become available, CDOT will identify projects to include in future phases based on the following priorities. The first priority will be given to replacing aging infrastructure and/or addressing safety issues. The replacement of aging infrastructure will be given priority when the infrastructure deteriorates to such an extent its conditions affect operations of the corridor or safety of the traveling public. Projects arising from safety considerations may be given priority when safety data indicate higher than average crash rates at a particular location or when a substandard area or pinch point has been identified which adversely impacts the public. Second priority will be given to projects that improve traffic operations of the managed lanes and/or the general-purpose lanes. These types of projects will be prioritized based on the degree to which they will positively impact transit and HOV/SOV functions, maximize travel time savings, and relieve congestion.

Although these proposed improvements will take place along the entire US36 corridor, impacts to federally protected species will likely occur only in the Boulder segment, which is the portion of US36 between approximately McCaslin Boulevard and the Table Mesa Drive/Foothills Parkway intersection. More specifically, impacts to Preble's will occur approximately 600 feet east of US36's intersection with Davidson Ditch to its intersection with Table Mesa Drive/Foothills Parkway, and impacts to the orchid will occur from Davidson Ditch westward to Table Mesa Drive/Foothills Parkway.

In the Boulder segment, the managed lane in each direction will remain adjacent to the median of US36 and will be separated from the general-purpose lanes by a painted buffer. In the westbound direction, the managed lane will become a general-purpose lane west of Cherryvale Road. In the eastbound direction, traffic will enter the added managed lane just west of Cherryvale Road. A new climbing lane in each direction will be provided from McCaslin Boulevard westbound and from Table Mesa Drive/Foothills Parkway eastbound to the top of Davidson Mesa. From Davidson Mesa westbound to Table Mesa Drive/Foothills Parkway and eastbound to McCaslin Boulevard, the climbing lane will be extended to become a bus-only lane if certain triggers are met as described above.

The Foothills Parkway/Table Mesa Drive interchange will be reconfigured slightly to improve geometric conditions. In particular, the existing loop-ramp from westbound Table Mesa Drive to eastbound US36 will be removed. The ramp from Foothills Parkway to eastbound US36 will be relocated to improve the merging operations among the US36, Table Mesa Drive, and Foothills Parkway traffic.

The existing general-purpose lanes in the Superior/Louisville and Boulder segments will need to be rebuilt, as they will be moved outward to accommodate the managed lanes in the median. No additional general-purpose lanes will be constructed. The Interlocken Loop, West Flatiron Circle, Coal Creek, and South Boulder Creek bridges will be reconstructed. Bridge and grade separation construction (aerial structure) will involve site preparation, excavation, installation and construction of support columns and abutments, placement of girders, and bridge deck construction.

Construction staging areas will be needed throughout the alignment to provide adequate space for equipment, construction materials, materials stockpiling, and worker parking. These parcels will be purchased or leased before construction begins. The BRT transit stations may be used for staging, thus offsetting the need to acquire additional staging areas. Haul routes for construction materials will be proposed by the contractor and approved by CDOT and the local jurisdiction.

An off-street, separated, multi-use bikeway facility adjacent to US36 is also part of the proposed project. Where appropriate, the bikeway connects to and makes use of existing on- and off-street facilities. The bikeway planned for this package will parallel US36 from Cherryvale Road to Foothills Parkway/Table Mesa Drive. Crossings of major arterials along US36 would be grade-separated. Grade separation of the bikeway from the major arterials is required due to safety and continuity criteria related to traffic volumes on the major arterials. Maintenance of the US36 bikeway will be the responsibility of the local jurisdictions through an Intergovernmental Agreement with CDOT.

#### Conservation Measures

Provisions in the project description that you will implement to reduce impacts of the action or further the recovery of threatened and endangered species are known as conservation measures.

As part of the proposed action, the beneficial effects of these conservation measures are taken into consideration in the jeopardy and incidental take analyses. Conservation measures are part of the proposed action and their implementation is required under the terms of this consultation. The proposed action, as described here, entails the entire Preferred Alternative in the FEIS.

CDOT and FHWA will further avoid or minimize impacts to Preble's and orchid habitat during final design and construction. Unavoidable impacts will be offset by various conservation measures including compensatory mitigation in areas near known occupied habitats. Compensatory mitigation for this project is still conceptual and specific mitigation will be determined during project phasing as funding is available; however, its intent is to assist recovery of the species through on- and off-site habitat actions, monitoring, and reporting. If impacts are determined to directly affect the Colorado butterfly plant during the final design process, then consultation will be initiated. Actions to improve or mitigate habitat for Preble's and the orchid will indirectly benefit the Colorado butterfly plant, as all three species are associated with riparian habitats. This would offset any indirect impacts that could occur to the Colorado butterfly plant as a result of the project.

Additional conservation measures identified in the biological assessment that will benefit Preble's or the orchid include the following:

- Construction of retaining walls along US36 in portions of the Boulder Segment to minimize habitat impacts on City of Boulder OSMP property.
- Implementation of permanent water quality BMPs to improve water quality and to ensure that stream flows are not altered by bridge and culvert replacement.
- Extension rather than replacement of existing culverts, where possible.
- Briefing of design engineers and construction staff on the need for further reductions of impact and the use of BMPs.
- Development of a construction schedule and work plan to include the location, type, projected time of completion, and projected timing of various construction activities.
- Development of a Memorandum of Agreement (MOA) between CDOT, the Service, and City of Boulder OSMP during final design of each stage of construction. The MOA will express the parties' intent to implement conservation and management of the listed species affected by construction of the project. It will also describe management of the mitigation property and details of mitigation and monitoring.

In addition, site-specific consultation will occur during final design for each project stage. Site-specific consultation will:

- Provide an updated baseline condition of species' listing status or habitat modifications from unrelated actions.
- Outline any new species commitments.
- Discuss new direct, indirect, or cumulative effects.
- Document construction impacts and detailed mitigation.
- Provide a detailed project description including timing, habitat affected, and project effects.

- Compare site-specific impacts to the incidental take anticipated in the programmatic documents to ensure that it is within the permitted amount.
- Develop a database to track the level of impact, number of individuals of a species taken, and acres of habitat lost. A summary of this information will be submitted annually to the Service.
- Describe the monitoring program to track project effects, level of incidental take, and effectiveness of avoidance/minimization measures and conservation actions.

Detailed conservation measures that you will apply during construction were provided in your biological assessment on pages 8-4 through 8-6 and are part of the project description. The intent of these conservation measures is to further avoid and reduce potential impact to Preble's and orchid populations and habitats. They may be superseded by more stringent or general conditions that are established during site-specific consultation.

You will offset unavoidable impacts to Preble's and orchid habitats and populations through compensatory mitigation. Your approach to compensatory mitigation for the US36 project is to continue consultation with the Service, City of Boulder OSMP, Boulder County, and other applicable federal, state, and local agencies to develop a comprehensive mitigation strategy for the South Boulder Creek floodplain ecosystem. Impacts to Preble's and the orchid from the proposed project are concentrated in the South Boulder Creek floodplain, and you are committed to developing mitigation in this area that will provide a benefit to the system as a whole rather than small isolated improvements. Although the project will be constructed in phases, and mitigation requirements will need to be met for each individual phase, your goal is to mitigate for each phase as part of a larger, comprehensive approach.

In anticipation of mitigation requirements, CDOT has coordinated with City of Boulder OSMP to identify potential mitigation sites that may provide opportunity for habitat improvements. Off-site mitigation may include property acquisition, restoration, monitoring, and possible ownership transfer, and would be focused on creation, enhancement, and restoration of habitat to create habitat linkages and provision of continuous movement corridors. The goal of the mitigation is to compensate for the loss of Preble's and orchid habitat and increase the quantity and quality of habitat for both species within their localized range. Mitigation projects aimed to restore, create, or enhance habitat linkages will be given the highest priority.

Nine potential mitigation sites within the South Boulder Creek floodplain were categorized based on their need for restoration and their vulnerability to development or other threats. Restorable sites have degraded habitat, but are contiguous to known occupied Preble's or orchid habitat and could be restored with an investment of resources for at least a season. Vulnerable sites contain suitable habitat or are occupied by Preble's or the orchid but are not protected through ownership by a public agency or land trust, or are not within a conservation easement. Acquisition of restorable or vulnerable sites for mitigation for the US36 project would need to result in a balance or gain of occupied or potentially occupied habitat, not of potential habitat.

Additionally, acquisition of open space buffers that would enhance the survival and dispersal of the species in occupied habitat would be allowed.

These properties may not be available or may not fit the requirements of the project when CDOT is ready to implement mitigation. If a site is not currently owned by City of Boulder OSMP or Boulder County, CDOT would have to acquire (through purchase or conservation easement), restore, and monitor the property for several seasons to ensure success, and possibly transfer ownership of the site. Funding for property acquisition and mitigation will be determined during the final design process. No contact has been made with the landowners to gather specific information about the current availability of the properties or their cost.

Current potential opportunities of restorable or vulnerable habitat as identified by City of Boulder and Boulder County, listed in order of priority are South Boulder Creek floodplain near Baseline Road, Lafayette Water Treatment Facility, Hogan property, Coal Creek at SH128, Straty-Cline/Colorado Open lands, Dry Creek, Boulder Creek at Jasper Road, South Central Grasslands Open Space on Rock Creek, and the Mayhoffer/Singletree property. Details of each site are provided in the biological assessment including current habitat condition, ownership, location, and type of mitigation possible (i.e., habitat protection, restoration, enhancement, or creation). In addition, the City recently expressed support of other potential, but yet undefined, mitigation sites located within the South Boulder Creek floodplain because these sites would support the ecological system where the project impacts would occur.

At this time, no specific acreages of compensatory mitigation have been identified because a construction schedule for the project has not yet been determined and there is no funding. Therefore, these mitigation opportunities do not reflect final mitigation, but instead provide direction and identify the types of situations that are currently possible.

#### Action Area

Our regulations define the action area to be all areas directly or indirectly affected by the Federal action, and not merely the immediate area involved in the action (50 CFR 402.02).

The project is located on the Front Range of the Denver metropolitan area, and includes the cities of Boulder, Louisville, Broomfield, and Westminster. The affected streams are in the St. Vrain watershed. The project area includes portions of South Boulder Creek, some associated irrigation ditches, and Coal Creek, Rock Creek, Big Dry Creek, and Walnut Creek. The majority of Preble's and orchid habitats are within the South Boulder Creek floodplain. Preble's are known to occupy Davidson and Goodhue ditches as well as South Boulder Creek within the project area. Rock Creek is occupied upstream of the project area in Rocky Flats and Coal Creek is also occupied on its upper reaches. The action area for the purpose of this consultation is the South Boulder Creek floodplain from the base of Davidson Mesa westward to the intersection of US36 and Table Mesa

Drive/Foothills Parkway. It extends northerly to approximately Baseline Road, and extends to the south to the Lafayette Water Treatment Facility.

## **STATUS OF THE SPECIES/CRITICAL HABITAT**

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

The Preble's meadow jumping mouse is a small rodent with an extremely long tail, large hind feet and long hind legs. The tail is bicolored, lightly-furred and typically twice as long as the body. The large hind feet can be one-third again as large as those of other mice of similar size. Preble's has a distinct, dark, broad stripe on its back that runs from head to tail and is bordered on either side by grey to orange-brown fur. The hair on the back of all jumping mice appears coarse compared to other mice. The underside hair is white and much finer in texture. Total length of adult Preble's mice is approximately 7 to 10 inches and tail length is 4 to 6 inches (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 designated critical habitat for Preble's in 50 CFR 17.68 on June 23, 2003 (68 FR 37275). Critical habitat for Preble's includes approximately 201.3 kilometers (125.1 miles) of rivers and streams and 4,264 hectares (10,542 acres) of lands in Wyoming and approximately 376.8 kilometers (234.1 miles) of rivers and streams and 8,386 hectares (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.

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 each of the three major river drainages where Preble's occurs (the North Platte River drainage in Wyoming, the South Platte River drainage in Wyoming and Colorado, and the Arkansas River drainage in Colorado) and for each subdrainage judged likely to support Preble's. The Working Draft uses 8-digit HUC boundaries to define subdrainages, and identifies 19 HUCs as occupied or potentially occupied. Of these, five are located in the North Platte River drainage, 11 in the South Platte River drainage, and three in the Arkansas River drainage. 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 two large and three medium populations in the South Platte River drainage, one large and two medium populations

in the North Platte River drainage, and one large population in the Arkansas River drainage. In each of the remaining ten HUCs, three small populations are called for. One large (Chugwater Creek, Lower Laramie HUC, North Platte River drainage) and one medium (Cottonwood Creek, Glendo HUC, North Platte River drainage) Preble's population in Wyoming, and one large Preble's population in Colorado (North Fork of the Cache La Poudre River, Cache La Poudre HUC, South Platte River drainage) that are designated in the Working Draft as recovery populations, have been designated as critical habitat. We are currently in the process of updating the Working Draft.

## Life History

### *Habitat*

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

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

Preble's is a true hibernator, usually entering hibernation in September or October and emerging the following May, after a potential hibernation period of seven or eight months. Adults enter

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

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

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

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

### *Reproduction*

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

### *Predation*

Preble's have a host of known predators including garter snakes (*Thamnophis* spp.), prairie rattlesnake (*Crotalus viridus*), bullfrog (*Rana catesbiana*), foxes (*Vulpes vulpes* and *Urocyon cinereoargenteus*), house cat (*Felis catus*), long-tailed weasel (*Mustela frenata*), and red-tailed hawk (*Buteo jamaicensis*) (Shenk and Sivert 1999a, Schorr 2001). Other mortality factors of Preble's include drowning and vehicle collision (Schorr 2001, Shenk and Sivert 1999a).

Mortality factors known for the meadow jumping mouse, such as starvation, exposure, disease, and insufficient fat stores for hibernation (Whitaker 1963) are also likely causes of death for Preble's.

### *Diet*

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

### **Population Dynamics**

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

### **Status and Distribution**

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

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

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

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

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

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

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

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

### **Threats**

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

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

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

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

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

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

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

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

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

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

On October 8, 2009, Critical Habitat was re-proposed and the South Boulder Creek floodplain was included.

### **Ute ladies'-tresses orchid**

The Ute ladies'-tresses (*Spiranthes diluvialis*) was first described as a species in 1984 by Dr. Charles J. Sheviak from a population discovered near Golden, Colorado (Sheviak 1984). The Ute ladies'-tresses are perennial orchids from the family Orchidaceae. The orchid first appears above ground as a rosette of thickened grass-like leaves that is very difficult to distinguish from other vegetation. Its leaves are up to 1.5 cm wide and 28 cm long; the longest leaves are near the base. The usually solitary flowering stem is 20 to 50 cm tall, terminating in a spike of 3 to 15 white or ivory flowers. Prior to 1992, extant populations of the Ute ladies'-tresses orchid in Colorado were known only in Jefferson and Boulder counties, within the Clear Creek and St. Vrain River watersheds. The largest populations in the region occur in the South Boulder Creek and St. Vrain River watersheds within the US36 corridor. Since that time, they have also been found in Garfield County along the Roaring Fork River, and in Larimer County in the Cache la Poudre River watershed.

Orchid habitats must consist of sufficient hydrology to keep soils moist at the surface throughout the growing season. Soils are generally silty-loam often underlain with cobble and gravel. The habitat settings are early to mid-successional riparian habitats (i.e., well established soils and vegetation) along perennial streams and rivers such as moist stream edges, high flow channels, old oxbows, vegetated point bars, and other fluvial features (USFWS 1992, Fertig 1994; USFWS 1995; Fertig 2000). The orchid may also occur in settings that mimic one of the above habitats, such as moist borrow pits, roadside ditches, reservoir edges, and berms (Ward and Naumann 1998).

Perennial graminoids and forbs and low vegetative cover dominate habitats occupied by Ute ladies'-tresses. A few populations in eastern Utah and Colorado are found in riparian woodlands, but generally the species seems intolerant of shade, preferring open, grass, sedge, and forb-dominated sites. Where colonies occur in more wooded areas, plants are usually found on the edges of small openings and along trails (Ward and Naumann 1998). The orchid is intolerant of crowding and competition. The orchid may persist for some time in the grassy understory of woody riparian shrublands, but does not appear to thrive under these conditions (Ward and Naumann 1998).

#### *Life history and Population dynamics*

Flowering of Ute ladies'-tresses generally occurs from mid-July through August, at which point location, identification, and population size estimates are typically determined. However, in

some locations the plant may bloom in early July or may still be in flower as late as early October. Some individuals remain underground or do not flower each year (Arft 1995; Riedel 1992).

Because of the unique anatomy of orchid flowers, only certain insects can accomplish pollination. Reproduction of the orchid is strictly sexual, with bumblebees (*Bombus* spp.) and anthophorans (*Anthophora* spp.) (Sipes and Tepedino 1995; Sipes et. al. 1993) as the primary pollinators. These insects visit the orchids for the nectar and pollination is accomplished incidentally. The number of seeds of the orchid varies greatly between plants. Each orchid fruit can have several hundred or up to 10,000 seeds but generally average around 2,000 (Sipes and Tepedino 1995). These seeds may be dispersed by water or wind (Wells 1981).

### *Status and Distribution*

Ute ladies'-tresses were federally listed as threatened on January 17, 1992 (57 FR 2048) throughout its entire range. No critical habitat has been designated for the species. To date, no recovery plan has been approved for this species. However, a draft recovery plan has been written (USFWS 1995).

Populations of orchids are known from three broad general areas of the interior western United States: near the base of the eastern slope of the Rocky Mountains in southeastern Wyoming and adjacent Nebraska and north-central and central Colorado; in the Upper Colorado River Basin, particularly in the Uinta Basin; and in the Bonneville Basin along the Wasatch Front and westward in the eastern Great Basin, in north-central and western Utah, extreme eastern Nevada, and southeastern Idaho, and central Washington.

At the time of its listing, the total known population size of Ute ladies'-tresses was fewer than 6,000 individuals from 11 populations occurring in Colorado, Utah, and Nevada (57 FR 2048). Several populations on the Wasatch Front, Utah; Great Basin, Utah and Nevada; and the Front Range of Colorado were believed to be extirpated due to activities associated with frontier settlement (urbanization, clearing land for agriculture, water diversion, etc.). Most known populations contained fewer than 1,000 plants when counted in 1990 and 1991. Eastern Utah populations were typically small in size. Since 1993, *S. diluvialis* has been discovered in southeastern Wyoming, southwestern Montana, western Nebraska, southern Idaho, and central Washington (Fertig et al. 2005). Populations are now known to occur in 38 watersheds at elevations ranging from 220 to 558 m (720 to 1,830 feet) in Washington to 2,134 m (7,000 feet) in northern Utah (Fertig et al. 2005). Recovery driven inventory efforts indicate that the number of existing and historical populations is 61, of which 53 are considered extant. Of all extant populations, 60 percent contain over 100 plants and 21 percent have greater than 1,000 individuals.

Population numbers, based on counts of flowering individuals, fluctuate greatly ranging from 23 percent to 79 percent (Ward and Naumann 1998). This is because a varying proportion of the

population may either be dormant underground or in a vegetative (non-flowering) state, thus not easily discerned during population monitoring. Therefore, the number of flowering adults does not give an accurate population size or structure. Monitoring of both flowering and vegetative plants by Arft (1995) indicated that population size may be fairly stable even though the number of flowering individuals demonstrates high variability. The life span of individuals is unknown, but plants studied over a nine year period were used to estimate a life expectancy of more than 50 years (USFWS 1995).

## **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 meadow jumping mouse/proposed critical habitat within the action area**

The project is located on the Front Range of the Denver metropolitan area, and includes the cities of Boulder, Louisville, Broomfield, and Westminster. The affected streams are in the St. Vrain watershed and include portions of South Boulder Creek, some associated irrigation ditches, and Coal Creek, Rock Creek, Big Dry Creek, and Walnut Creek. The majority of Preble's and orchid habitats are within the South Boulder Creek floodplain. Preble's are known to occupy Davidson and Goodhue ditches as well as South Boulder Creek within the project area. Rock Creek is occupied upstream of the project area in Rocky Flats and Coal Creek is also occupied on its upper reaches.

The existing US36 was originally constructed in the 1950s, therefore; disturbance of the vegetation and riparian habitat and changes in stream morphology in areas previously and currently occupied by Preble's has already occurred. The irrigation ditches that cross under US36 in Boulder generally carry water between April and November, which overlaps with the Preble's active season. Therefore, during the active season, Preble's movement is limited at some crossings when water is present in ditches. The existing bridge at South Boulder Creek does not impede Preble's movement under US36 as evidenced by positive trapping records on both sides of the highway.

The easternmost segment of the project corridor, the Denver and Adams segments, extend along US36 from I-25 to Sheridan Boulevard. They are heavily urbanized and do not support habitat for listed species. The Westminster and Broomfield segments are also urbanized, especially at the easternmost portions, and extend from Sheridan Boulevard to just west of SH287. The Colorado butterfly plant occurs in the Westminster segment, though not within the project corridor.

All impacts to listed species and their proposed critical habitat will occur in the Boulder segment, which extends from approximately McCaslin Boulevard to the Table Mesa Drive/Foothills Parkway intersection in Boulder. Primary vegetation types within the South Boulder Creek floodplain include grassland, riparian woodland and shrub, wetlands, and grassland with some irrigated and dryland agriculture. Narrow bands of riparian vegetation are present along a number of streams and some irrigation canals. Adjacent upland areas on OSMP property are irrigated pastures and hayfields and residential. OSMP property has suitable vegetation, hydrology, and soil characters to support both Preble's and orchids. The portion of the bikepath alignment along Cherryvale Road and South Boulder Road is bounded by City of Boulder OSMP property on both sides of the road. A large portion of the area along Cherryvale Road appears to contain wetlands and Cherryvale Road crosses South Boulder Canyon Ditch; South Boulder Road crosses South Boulder Creek. Preble's habitat likely to be affected by the project provides sites for foraging, nesting, and movement.

A portion of the project area lies within proposed Critical Habitat Unit 5, South Boulder Creek, Boulder County, Colorado. It encompasses approximately 856 acres on 8 miles of streams within the South Boulder Creek watershed. It includes South Boulder Creek from Baseline Road upstream to Eldorado Springs, and includes the Spring Brook tributary. This unit is located within the St. Vrain Hydrologic Unit Code (HUC) and is proposed to address the medium recovery population designated for this area in the Working Draft. Portions of the area have been the subject of Preble's research and, in places, high densities of Preble's have been documented. The unit's wide floodplain, complex ditch system, and irrigation of pastures make its habitat unique. Pressure for expanded development is occurring on private lands within the unit, and recreational use of the OSMP lands is considerable.

The project is not anticipated to induce growth due to surrounding land use (City of Boulder Open Space and agriculture) and the nature of the proposed project.

In the time since the listing of the Preble's, May 1998, through December 2009, we have conducted 138 formal consultations pursuant to section 7 of the Act and issued 20 incidental take permits pursuant to section 10(a)(1)(B) of the Act regarding Preble's in Colorado. Through these actions, we have exempted or permitted incidental take of Preble's through over 874 acres of permanent habitat loss and over 1,848 acres of temporary habitat loss.

#### **Status of the Ute ladies'-tresses orchid within the action area**

A large population of Ute ladies'-tresses orchids occurs in the South Boulder Creek floodplain within City of Boulder OSMP lands on both sides of US36. Individuals are located primarily in irrigated meadows, but also in more natural habitat along South Boulder Creek and small to large patches in wet meadows adjacent to South Boulder Creek.

Based on surveys conducted by City of Boulder OSMP of their properties since 1999, scattered locations of Ute ladies'-tresses orchids occur between Davidson Ditch and Table Mesa Drive.

The largest concentration of orchids surveyed by City of Boulder OSMP occurs west of South Boulder Creek along both sides of US36 on OSMP property up to the fence line of the CDOT right-of-way. During a site reconnaissance conducted in summer 2004, at least 50 plants were observed in or adjacent to the US36 footprint

**Factors affecting the environment of the Preble's meadow jumping mouse/proposed critical habitat and Ute ladies'-tresses orchid within the action area**

Development throughout the Denver metropolitan area has increased resulting in a higher population and an associated decrease in habitat, increase in habitat fragmentation, increase in impervious surfaces, increase in invasive weed species, and increased use of the highway system. Much of the land in the project area is publicly owned so is not under a threat of development. Parcels under private ownership also exist near the project area.

**EFFECTS OF THE ACTION**

Impacts to Preble's and the orchid were assessed by comparing the footprint of the proposed project to the occupied habitats or known ranges of each species. The limits of construction for the US36 project include the toe of slope (the bottom of the slope that falls away from the edge of the highway) plus 15 feet for construction. All water crossings will involve construction in the riparian areas of the streams, causing short-term sedimentation. Due to the small width of these streams, direct construction impacts to the riparian areas would be from 0.1 to 0.2 acre on either side of the crossing. Vegetation that is removed will be replaced immediately after construction is complete. Construction of new, replaced, or widened bridges would require 100 feet on either side of US36 to allow room for cranes and other equipment to place the girders. Bridge and grade separation construction (aerial structure) would involve site preparation, excavation, installation and construction of support columns and abutments, placement of girders, and bridge deck construction.

In general, highway construction projects directly affect wildlife and plants through land use change and habitat loss, as well as disturbance causing changes in behavior or movement, and possibly mortality. Effects may include direct effects that result from the action as well as indirect effects. Direct effects include impacts to individual plants or animals from loss of habitat, displacement from disturbance, and loss of habitat connectivity. Indirect effects include degradation of habitat from increased water runoff, loss of connectivity, and competition from noxious weeds and non-native species. Cumulative effects include impacts of the project combined with past, present, and future projects. Effects may be further defined as temporary or permanent and short-term or long-term. At this time, all impacts are assumed to be permanent because of the early level of design of the project. As design is refined, impacts will be further avoided and minimized, and categorized as temporary or permanent.

### **Preble's meadow jumping mouse/proposed critical habitat**

Preble's occupy stream and ditch crossings within the project area under and adjacent to the US36 alignment in Boulder County. These locations include South Boulder Creek north and south of US36, and all suitable riparian and adjacent upland habitat east to Davidson Ditch. Destruction of riparian habitat directly and indirectly affects Preble's by destroying nest sites, food resources, and hibernation sites; by disrupting behavior; or by forming a barrier to movement. Direct effects were quantified for Preble's by measuring acres of habitat within the footprint of the project alignments using GIS. Indirect effects of connectivity losses (or gains) from extension or replacement of bridges and culverts in Preble's habitat were analyzed by comparing the existing dimensions of crossing structures with the proposed changes and with consideration of existing connectivity conditions. The total project impact area is anticipated to be approximately 41.71 acres.

The proposed project would directly affect Preble's through loss of habitat from widening of the highway and extension of culverts, as well as incidental mortality to individuals from earth moving or crushing during construction. Construction activities that must occur during Preble's active season may affect breeding, feeding, and dispersal. Individual mice would be susceptible to mortality from earth moving and excavation that occurs while individuals are in hibernation or while active. Active individuals may escape construction equipment, though the mice may hide in burrows or nests when construction occurs and still could potentially be crushed.

Permanent, indirect effects to Preble's include degradation of habitat caused by increased noxious weeds, habitat alteration caused by changes in hydrology and drainage patterns from development, and increased water runoff. Increased runoff could reduce water quality and result in increased flow in culverts, which would reduce connectivity for Preble's across the highway. Alteration of habitat from highway construction from hydrology changes could eliminate wetlands adjacent to the highway, which would also have a negative effect on Preble's. Drought conditions and decreased flows may have a short-term positive effect for Preble's movement through culverts, but loss of wetland vegetation caused by decreased hydrology would have a negative effect. Hydrological alterations caused by the US36 project are unknown at this time.

Several of the ditch crossings in the corridor have not yet been fully designed. Although the height of some of these bridges could change, the assumption at this time is that it will not change. According to the biological assessment, for the known occupied crossings, Davidson and Goodhue ditches and South Boulder Creek, crossing length is conservatively anticipated to increase by 330 feet at Davidson Ditch for a total out-to-out width of 440 feet, a conservative increase of 110 feet at Goodhue Ditch for a total out-to-out width of 270 feet, and a conservative increase of 40 feet at South Boulder Creek for a total out-to-out width of 227 feet. The conservative estimates may include the working area around these structures so that the actual structure width may be less. More detail will be determined during final design and will be fully assessed during site-specific consultation.

During construction, replacement or extension of bridges and culverts will temporarily reduce connectivity between occupied habitats on both sides of the highway. Permanent impacts to Preble's habitat connectivity will be affected to some extent by lengthening of crossings under US36. Some of these structures will exceed 300 feet, which is close to the maximum known culvert dispersal distance for the Preble's meadow jumping mouse of 305 feet (Ensign 1999). In many cases, habitat connectivity may be improved by replacing the existing structure with a larger one, especially with the addition of ledges for small mammal passage during periods of flowing water. For structures that are extended rather than replaced without the addition of ledges, movement would still be restricted to low or no flow conditions.

Temporary, direct effects to Preble's will occur during construction. Although these effects are difficult to quantify, disturbances to habitat may affect breeding behavior, dispersal ability, and susceptibility to predation. Temporary impacts will result from staging and use of construction equipment in the riparian corridor. Areas of temporary habitat loss would be restored following construction through vegetation restoration. In addition, lights used for night construction may affect Preble's in the vicinity of construction, causing changes in normal breeding and foraging behaviors for the duration of construction activity. The most common noise sources would be from engine-powered heavy earth-moving equipment (scrapers, bulldozers, etc.), materials handling equipment (cranes), and stationary equipment (generators). The loudest and most disruptive construction noise will result from pile driving and demolition work, which will require the use of jackhammers and hoe rams.

The acreage of impact (41.71) represents a small proportion of available habitat for Preble's. The areas of impact are located primarily along the existing US36 road right-of-way and are therefore not necessarily high quality habitat. However, habitats at the various ditch and creek crossings along US36 are known to be occupied by Preble's. Indirect effects to Preble's from loss of connectivity at riparian corridors may occur in some locations, however, replacement of crossing structures would increase connectivity across the highway.

Although the project will result in alteration and loss of Preble's habitat, with implementation of conservation measures, the project should not cause permanent habitat fragmentation and loss of connectivity within and between populations in the project area once construction and restoration are complete.

The project will affect a total of 7.36 acres, which is approximately 1.2 percent, of proposed critical habitat in Unit 5. Phase I of the proposed action accounts for 6.92 acres, and the remaining 0.44 acres of impact will occur if the bus-only lane is constructed. All primary constituent elements (riparian vegetation, connectivity, geomorphology, and hydrology) will be affected to some degree within that footprint. Despite these alterations, the area should continue to provide the function of the critical habitat by providing sufficient habitat and connectivity for Preble's. The project should not cause permanent habitat fragmentation or loss of connectivity across US36. Because of the small impact, we have concluded that the adverse effects to proposed critical habitat from the project will not diminish the purpose of the critical habitat as

providing for the conservation of the species. After project completion, including the conservation measures, the unit will still be able to provide for the persistence and recovery of Preble's.

### **Ute ladies'-tresses orchid**

Direct impacts to the orchid include habitat loss and removal of individual plants. Areas of occupied habitat were identified based on information provided by City of Boulder OSMP. Additional areas classified as potentially occupied habitat are based on field reconnaissance; these are areas where the orchid has not been found to date, but could occur in the future. Because the orchid may not emerge annually, delineating specific areas of occupied range is difficult. Therefore, impacts are defined for "potentially occupied habitat," as well as "occupied habitat" because plants may be present currently or could become established by the time construction is initiated.

In occupied habitat, individual plants that occur within the construction footprint could be destroyed by crushing, uprooting, or burial during ground-clearing and earth-moving activities. Impacts are most likely to occur where the construction footprint would extend outside of the CDOT right-of-way for road widening, on-ramps, and stormwater detention ponds. The number of plants that would be affected is unknown, but is likely to represent only a very small portion of the South Boulder Creek population, which numbers around 8,500 plants.

Indirect impacts to the orchid from implementation of the proposed action could occur from highway runoff and construction itself. Information on hydrological alterations as a result of the US36 project is not known at this time. However, highway widening will increase the area of impervious surface, which would increase the amount of runoff from the highway to riparian areas and wetlands. Highway storm runoff contains sediments, hydrocarbons (oil, grease, fuel), litter, deicing salts and minerals, and heavy metals. In areas where orchids occupy habitat adjacent to the highway right-of-way, such as the Van Vleet Open Space, it is possible that this increased runoff could enter the riparian habitat, resulting in some amount of degradation and increased flows in streams; resulting in long-term, adverse effects to the plants. However, water would be treated in detention ponds adjacent to the highway.

In your biological assessment, you estimate that 35.94 acres of occupied and potentially occupied habitat will be affected by the proposed action. Proposed conservation measures will minimize impacts.

### **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.

Habitat within the vicinity of the project area is protected as open space by the City of Boulder and will continue to be protected. Preble's and orchid habitats are generally in good condition on City of Boulder open space property. The City of Boulder and Boulder County have several land use policies in place that are intended to protect sensitive habitats and manage growth in the vicinity of the action area. Implementation of these policies and regulations would minimize the impact of future developments.

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

## **CONCLUSION**

### **Preble's meadow jumping mouse/proposed critical habitat**

After reviewing the current status of Preble's, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological and conference opinions that the action, as proposed, is not likely to jeopardize the continued existence of Preble's, and is also not likely to destroy or adversely modify proposed critical habitat.

### **Ute ladies'-tresses orchid**

After reviewing the current status of the orchid, 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 orchid.

## INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent act or omission that creates the likelihood of injury to listed wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

This incidental take statement is based on full implementation of the proposed action as described in the Description of the Proposed Action section of this biological and conference opinion, including conservation measures that were incorporated into the project design. Relevant aspects of the proposed action (including conservation measures) include, but are not limited to, the following:

1. Avoidance of impacts to Preble's and orchid habitats.
2. Minimization of impacts to Preble's and orchids habitats through implementation of BMPs and further refinement of project design.
3. Implementation of compensatory mitigation plan as described in section 8.4 of the biological assessment.

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

Sections 7(b)(4) and 7(o)(2) of the Act do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the Act prohibits the removal of federally listed endangered plants or the malicious damage of such plants on areas under federal

jurisdiction, or the destruction of listed plants on non-federal areas in violation of state law or regulation.

### **Amount or Extent of Take Anticipated**

The Service anticipates incidental take of Preble's through direct killing and by loss of food, cover, and other essential habitat elements. This take will be difficult to detect because of their small size and hibernation underground. However, the following level of take can be anticipated by the loss of food, cover, and other essential habitat elements. The Service anticipates that the proposed action will result in incidental take of Preble's through a maximum permanent and temporary loss of no more than 41.71 acres of Preble's habitat, of which 7.36 acres is proposed critical habitat. Habitat in the project area is inhabited year-round by Preble's.

Incidental take may also occur through secondary impacts to Preble's and its habitat, though this take is not expected to be significant because US36 has affected the area for many years, and only insignificant additional secondary threats to Preble's will be introduced through completion of the project. The project area is occupied by Preble's and is also likely used for travel or dispersal. Conservation measures will minimize take.

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

### **Reasonable and Prudent Measures**

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the effects of incidental take that might otherwise result from the proposed action.

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

1. The FHWA will monitor the extent of habitat impacted to assure that it does not exceed the authorized area.
2. The FHWA will monitor all aspects of proposed onsite restoration and enhancement to assure project completion and success.
3. The FHWA will ensure that all offsite acreage conserved to offset the projects' impacts are maintained into perpetuity as Preble's habitat, including reestablished linkages. These areas will be monitored to assure project completion and success.

4. The FHWA will ensure that BMPs designed to minimize take are implemented and successful.
5. The FHWA will ensure that site-specific biological assessments are submitted and approved by the Service prior to implementation of any specific action.
6. The FHWA will ensure that offsite fill material will not be obtained from nor disposed of in an area containing a listed species or its habitat without Service approval.

### **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 requirements. These terms and conditions are non-discretionary.

The following terms and conditions implement the reasonable and prudent measures:

1. The following terms and conditions implement reasonable and prudent measure number 1. Work will be supervised, inspected, and monitored at all times by an onsite individual from CDOT or by an authorized representative. Staging areas for equipment will be outside habitat areas or in permanently impacted areas.
2. The following terms and conditions implement reasonable and prudent measure number 2. The FHWA will include as a binding condition of project approval that CDOT conduct annual monitoring of onsite revegetation efforts and noxious weeds. Monitoring will extend for at least three growing seasons (or until such time as the FHWA and the Service determine that proposed revegetation has been successfully completed). Success criteria will be established during site-specific consultation.

CDOT shall forward monitoring reports to the FHWA and the Service after each growing season and prior to February 1. CDOT must also provide a report to the FHWA and the Service, which includes photographic documentation of site conditions within identified Preble's habitat prior to construction and at completion of construction.

3. The following terms and conditions implement reasonable and prudent measure number 3. FHWA and CDOT will enter into agreements with property holders to maintain and manage their properties for the benefit of Preble's into perpetuity. This term and condition applies to FHWA/CDOT's commitment to develop a comprehensive mitigation strategy for the South Boulder Creek floodplain ecological system, as stated in the biological assessment. Success criteria will be established when these sites are chosen. CDOT shall forward monitoring reports to the FHWA and the Service after each growing season and prior to February 1.

4. The following terms and conditions implement reasonable and prudent measure number 4. An employee awareness training session will be held prior to construction. Meeting minutes and a list of attendees will be submitted to the Service. During this training, workers will be informed by CDOT as to the reason for and importance of limiting impacts to vegetated habitat outside the fenced work area. BMPs will also be presented and discussed at this time.

5. The following terms and conditions implement reasonable and prudent measure number 5. Site specific biological assessments must contain a complete project description including the location of the actions covered and efforts taken to avoid and minimize project impacts. The project schedule will also be provided. Additionally, the biological assessment must determine whether this project fits into the programmatic consultation by showing the effects of the project. A precise estimate of the expected level of impact, the amount of take, and the amount of habitat affected or lost must be included.

6. The following term and condition implements reasonable and prudent measure number 6. CDOT will include in the project specifications that the contractor shall obtain prior written approval from the Service and/or CDOT's Threatened and Endangered Species staff specialist for all borrow or offsite material sources or for material disposal sites. The contractor and workers will be informed during training that they will be required to submit proof of compliance. This condition will assure that offsite indirect impacts of the project to listed species are minimized.

7. In the unlikely event that a Preble's mouse is encountered (dead, injured, or hibernating) during construction activities, the Colorado Field Office of the Service shall be contacted immediately at 303 236-4773.

The Service believes that no more than 41.71 acres of Preble's habitat and 7.36 acres of proposed critical habitat will be adversely affected as a result of the proposed action. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The FHWA must immediately provide an explanation of the causes of the increased level of taking and review with the Service the need for possible modification of the reasonable and prudent measures.

### **CONSERVATION RECOMMENDATIONS**

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The Service has no conservation recommendations at this time.

### **REINITIATION - CLOSING STATEMENT**

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

You may ask the Service to confirm the conference opinion as a biological opinion issued through formal consultation if the critical habitat is designated. The request must be in writing. If the Service reviews the proposed action and finds that there have been no significant changes in the action as planned or in the information used during the conference, the Service will confirm the conference opinion as the biological opinion on the project and no further section 7 consultation will be necessary.

After designation of critical habitat for Preble's and any subsequent adoption of this conference opinion, the Federal agency shall request reinitiation of consultation if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect the species or critical habitat in a manner or to an extent not considered in this conference opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the species or critical habitat that was not considered in this conference opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

The incidental take statement provided in this conference opinion does not become effective until the species is listed and the conference opinion is adopted as the biological opinion issued through formal consultation. At that time, the project will be reviewed to determine whether any take of the habitat has occurred. Modifications of the opinion and incidental take statement may be appropriate to reflect that take. No take of the habitat may occur between the designation and the adoption of the conference through formal consultation, or the completion of a subsequent formal consultation.

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

Sincerely,



Susan C. Linner  
Colorado Field Supervisor

ec: FHWA (Monica Pavlik)  
CDOT, HQ (Jeff Peterson)  
CDOT, R6 (Jane Hann, Jon Chesser)  
Michael

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