Programmatic Biological Assessment:
Interstate 25 Corridor, Powers Boulevard North, and Shoup Road Projects in El Paso County, Colorado

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Submitted to Wilson & Company

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EXECUTIVE SUMMARY

The Federal Highway Administration (FHWA) and Colorado Department of Transportation (CDOT) are evaluating potential environmental impacts from three proposed highway projects that would affect habitat and populations of the Preble's meadow jumping mouse (*Zapus hudsonius preblei*) in El Paso County, Colorado. This small mammal was listed as threatened under provisions of the Endangered Species Act in 1998; the listing was primarily due to loss and degradation of Preble's riparian habitat.

The majority of the proposed impacts will be to habitat along existing roadways. Project descriptions, biological impacts, and off-setting conservation measures have been described here in a programmatic biological assessment (PBA) format. The PBA contains details on project activities that affect Preble's, biological consequences of these actions, cumulative effects, effects on proposed critical habitat, and procedures for permitting and amending specific projects.

The three general project areas include I-25 north of Colorado Springs, Powers Boulevard north (from State Highway 83 to I-25), and the new Shoup Road/SH 83 intersection. Preble's habitat within these project areas was identified, and project impacts were overlaid on habitat maps. Some of the project impact areas would take place within areas that have been proposed as critical habitat by the U.S. Fish and Wildlife Service. Project impacts would take place in both riparian and adjacent upland habitat areas, with most impact areas in close proximity to existing highway sections.

FHWA and CDOT conducted two workshops with environmental and design engineer staff to identify areas where proposed impacts could be avoided or minimized. Impacts to habitat were avoided and minimized where possible, but a total of 61.86 acres of Preble's habitat may be affected by project actions (25.7 acres of permanent impact, 36.16 acres of temporary impact). It is anticipated that these impacts are worst case scenarios and that there will be opportunities to further reduce impacts during final design plans.

CDOT/FHWA have been working on conservation goals and a strategy for several years. The conservation strategy was designed to support recovery of the Preble's in the Monument Creek Recovery Unit. In the draft Preble's Recovery Plan, the U.S. Fish and Wildlife Service (USFWS) indicated that a single large Preble's population (greater than 2,500 animals or 50 connected stream miles) in the Monument Creek Recovery Unit was needed.

CDOT/FHWA convened a panel of Preble's experts in 1999 to identify the most important regional issues for the mouse and potential conservation measures to address these issues. Some of those recommendations were further refined in a habitat modeling exercise in 2001-02. The Panel identified that isolation of small Preble's populations was the greatest threat to long-term persistence of this animal in the Monument Creek watershed.

Subsequent work showed that there were at least six separate Preble's populations in the watershed, and restoring habitat linkages among these populations would be the most important strategy for achieving recovery.

CDOT/FHWA designed a conservation package with specific measures that would address the goal of Preble's recovery. The package has four sections:

1. On-site actions include restoration, enhancement and creation of Preble's habitat that is within or near project disturbance areas. Best management practices will be implemented as appropriate.
2. Off-site actions will include restoring habitat linkages in at least two areas, and permanently protecting an additional 50 acres of habitat within two riparian corridors where previous CDOT/FHWA protection efforts have already been successful. The two corridors are Dirty Woman Creek (including the confluence area with Monument Creek) and Jackson Creek. Additional habitat restoration/enhancement will be conducted on some of these properties as needed.
3. Monitoring will be conducted to assure that disturbance areas do not exceed permitted amounts, and to gage the success of restoration efforts. Special monitoring programs will be conducted at habitat linkage areas to determine success of restoring connectivity among Preble's populations.
4. CDOT/FHWA will sponsor a research project to determine the effectiveness of small mammal ledges in culverts; successful treatments will be incorporated into future culvert design and construction.

Although these projects will result in alteration and loss of Preble's habitat, they will not cause habitat fragmentation and loss of connectivity within and between populations in the project areas once project restoration is complete. Habitat connectivity and mouse mobility will improve at some project sites by improved culvert and bridge designs. Most project actions will occur within habitat that supports low density Preble's populations, and the nature of the impacts and subsequent restoration actions will allow populations in project areas to recover, including areas that have critical habitat.

Collectively, on-site and off-site actions will allow affected Preble's populations to recover to pre-disturbance levels and promote persistence of a large Preble's population in El Paso County.

I. INTRODUCTION

Background

The Federal Highway Administration (FHWA) and Colorado Department of Transportation (CDOT) have prepared this programmatic biological assessment (PBA) to cover permitting needed for three highway projects that will take place within El Paso County over the next decade. All three projects will affect habitat for the Preble's meadow jumping mouse (*Zapus hudsonius preblei*), a federally threatened species. The use of the terms Preble's, jumping mouse, and PMJM all refer to the Preble's meadow jumping mouse, unless otherwise stated.

These three projects are:

1. Reconstruction and capacity improvements to Interstate 25 (I-25) in El Paso County;
2. Reconstruction of the Shoup Road intersection at State Highway 83 (SH 83), and
3. Extension of Powers Boulevard from SH 83 to its northern termination at I-25.

All project areas are displayed in Figure 1. The I-25 area displayed in Figure 1 shows the Preble's habitat area that would be affected by the proposed project.

The I-25 improvements are currently under review through the National Environmental Policy Act (NEPA) process. An Environmental Assessment (EA) is being prepared, resulting in either a Finding of No Significant Impact (FONSI) or an Environmental Impact Statement (EIS) and Record of Decision (ROD). As part of the NEPA requirements for I-25, all appropriate environmental documentation for the project must be completed before a decision is reached on proposed project actions. This Programmatic Biological Assessment (PBA) is being prepared as part of the NEPA compliance effort.

The I-25 corridor project in El Paso County includes improvements to the existing interstate from Exit 135, State Highway 16 (south end) to Exit 161, the Monument/State Highway 105 interchange near the El Paso/Douglas County line (north end). Proposed improvements include general highway widening, addition of high-occupancy vehicle (HOV) lanes, and five major interchange improvements. Construction of Park-n-Rides are also proposed in the I-25 corridor, including one at Baptist and one at Northgate. Park-n-Ride lots will not be located in Preble's habitat.

The North Powers Boulevard corridor was evaluated through the NEPA process, and an EA was prepared with the issuance of a FONSI in 1997 (URS, 1997). The EA evaluated the impacts from construction of a new highway between Woodmen Road and I-25. Portions of Powers Boulevard have been constructed. The project addressed in this biological assessment lies between SH 83 and I-25 near the Northgate interchange.

For the Shoup Road project, the intersection at Shoup Road and SH 83 will be rebuilt to include additional lanes and a new bridge over Black Squirrel Creek. SH 83 will also be realigned in this area. An EA was prepared for improvements to SH 83 between Academy Boulevard and Shoup Road and a FONSI was issued in March 1987.

This PBA will review impacts from these proposed and approved projects to the Preble's meadow jumping mouse (*Zapus hudsonius preblei*). This mouse was listed as threatened by the U.S. Fish and Wildlife Service (USFWS) on May 12, 1998 (Federal Register 63 FR 26517). The use of the term mouse or jumping mouse in this document refers to the Preble's meadow jumping mouse. After consultation with the USFWS, it was determined that there were no other listed species that would be affected by proposed project actions.

The PBA document provides information on proposed project impacts to mouse populations and habitat and their biological consequences (including effects on proposed Preble's critical habitat).

General Project Descriptions

Interstate 25

The proposed action for improving Interstate 25 capacity will take place in El Paso County along a 29-mile stretch of I-25 between the SH 16 and Monument interchanges. Construction impacts will fall into two general categories: roadway widening and interchange reconstruction. Some improvements on I-25 have already been started through safety improvement projects, including: Circle Drive/Lake Avenue interchange, Nevada Avenue/Tejon Street interchange, Bijou Street to Fillmore Street (including Uintah Street interchange and Fontanero Street interchange), Woodmen Road interchange, and North Academy Boulevard interchange. All of these completed or approved safety project improvements, with the exception of the Monument and North Academy interchanges, are located outside of the area occupied by the mouse as determined by the U.S. Fish and Wildlife Service (USFWS). Some of these drainages were formerly occupied, but have been issued block clearances by the USFWS based on numerous negative trapping surveys (see Section II, Background). For the reconstruction of the Monument interchange, which is located within mouse habitat, a separate BA was prepared by FHWA and CDOT, and a Biological Opinion (BO) was issued by the USFWS in August 2000 (USFWS 2000). The North Academy interchange was under construction at the time Preble's was listed (May 1998), and FHWA/CDOT conducted a Section 7 conference with USFWS for that project.

It is anticipated that the Interstate 25 project will be constructed in three phases. Phase I of the project would add one lane in each direction, resulting in three through-lanes per direction between South Circle Drive and Briargate Parkway. Phase II of the project would add one lane in each direction between Briargate Parkway and the Monument Interchange. Phase III, the final configuration of Interstate 25 through northern El Paso County, would add one high occupancy vehicle (HOV) lane in each direction between

Briargate Parkway and the Martin Luther King bypass, and one general purpose traffic lane in each direction between the Circle/Lake interchange and South Academy Boulevard. All lanes south of the Interquest Parkway interchange will be added in the median between the existing northbound and southbound lanes of the interstate. For lanes north of Interquest Parkway, the median is either not wide enough to accommodate the new lanes, or the median has Preble's habitat. Lanes in this area will be added to the outside of the existing pavement.

Permanent impacts to mouse habitat will result from new roadway construction occurring within the median and outside of the interstate pavement but within the existing right-of-way. The proposed construction will affect a 20-foot-wide (6.1-meter) area within the median and 20 feet (6.1 meters) in each direction outside the existing roadway. The average right-of-way width is 300 feet (91.5 meters; this includes all paved lanes and shoulders). Most of the roadway widening should take place within the right-of-way. Much of this right-of-way area is either non-habitat (because of paving or mowing), or moderate to poor-quality habitat.

The proposed action also includes six major interchange reconstruction projects:

- Baptist Road interchange, Exit 158;
- Northgate/Powers interchange, Exit 156;
- North Nevada Avenue/Rockrimmon interchange, Exit 148;
- Fillmore Avenue interchange, Exit 145;
- Bijou Street interchange, Exit 142, and
- Cimarron (US Highway 24) interchange, Exit 141.

Of the interchanges listed above, Baptist and Northgate/Powers are located in areas with known Preble's habitat; the Nevada/Rockrimmon interchange is located at the northern edge of the Colorado Springs Preble's block clearance zone; and the Fillmore, Bijou and Cimarron interchanges are located in the center of the Colorado Springs Preble's block clearance zone.

The Baptist, North Gate/Powers and Nevada/Rockrimmon interchanges are described below.

The Baptist Road interchange, at I-25's Exit 158, exists as an unsignalized diamond interchange where a bridge carries a two-lane cross-street over the four-lane freeway. This is already a serious traffic bottleneck, and the existing interchange will not meet future traffic demands in the rapidly developing northern El Paso County area. CDOT evaluated five alternative concepts and is proposing to replace the existing facility with an improved diamond interchange configuration. The reconstructed interchange will have an expanded bridge to carry more lanes of Baptist Road traffic over more lanes of I-25 traffic. Local business access and frontage roads will be redesigned to accommodate better traffic operations. The existing frontage road in the southeast quadrant of the interchange crosses Jackson Creek and adjacent Preble's meadow jumping mouse habitat. CDOT has purchased 65 acres here for conservation purposes. Under the proposed

action, the existing frontage road will be removed and replaced on the east boundary of the conservation area. Minimizing impacts to Preble's habitat was an important factor in development of the proposed configuration and the four alternative configurations that were considered in the conceptual design process.

The existing Northgate interchange, at I-25's Exit 156, provides access for Northgate Road, the main visitor entrance to the U.S. Air Force Academy (USAFA). South of this substandard cloverleaf interchange, free-flow ramps are planned for a system-to system interchange connecting Interstate 25 and the planned Powers Boulevard. The entire interchange complex, including the I-25 mainline, is situated on USAFA property. In close coordination with USAFA, CDOT developed and considered numerous interchange alternatives, before selecting a proposed action. Preble's habitat is found along Smith Creek (immediately south of the Northgate interchange) and also in the Monument Branch tributaries at the south end of the proposed Powers Boulevard ramps. Replacement of substandard loop ramps at Northgate Road with a diamond interchange configuration may allow for restoration of upland habitat for the mouse. Minimization of adverse impacts to Preble's habitat was an important factor in the concept design process.

Under the proposed action, substandard ramps at I-25's Exits 147 (Rockrimmon Boulevard), 148A (North Nevada Avenue), and 148B (Corporate Center Drive) will be replaced with a consolidated split-diamond interchange configuration, improving capacity and safety for all roadways involved. Monument Creek flows southward under I-25 bridges here to bisect this interchange project area. Due to the complexities of the local roadway system here, ten interchange concepts were developed for consideration. The concept design process attempted to minimize impacts to wetlands, riparian areas and floodplains. These efforts will prove beneficial if the Preble's mouse is someday able to recolonize this northernmost reach of the Colorado Springs block clearance zone.

The I-25 EA also examines a No-Action Alternative, in which I-25 widening would not take place, but all other projects in the regional transportation plan for 2025 would be implemented, including North Powers Boulevard and the SH 83/Shoup Road intersection project.

As part of the I-25 EA process, CDOT prepared a Mode Feasibility Alternatives Analysis that examined alternatives including rail transit options, express bus lanes, six-lane highway variations, and alternate routes such as Powers Boulevard or a Front Range Toll Road. Apart from the Proposed Action, none of the alternatives was found to meet the project purpose and need, which is to relieve existing and projected future traffic congestion on Interstate 25.

Storm drainage improvements north of the North Academy Boulevard interchange, which is primarily in a rural setting, will consist of roadside and median grass-lined swales and buffer strips, and cross-culverts and bridges. South of the North Academy Boulevard interchange the interstate passes through the highly urbanized area of Colorado Springs. Storm drainage in this area will predominantly consist of storm sewer systems, pipes, bridges and other structures and devices common to urban storm drainage. Temporary

erosion and sedimentation control improvements for construction activities will be included in all projects. Permanent detention/stormwater quality ponds will be constructed in interchange infield and other open areas where feasible. Other permanent stormwater quality Best Management Practices (BMPs) will be constructed for all drainage discharge locations, as practical.

North Powers Boulevard

Powers Boulevard has been constructed between Woodmen Road and Research Parkway. Construction of Powers between Research and SH 83 is currently underway. Powers Boulevard will ultimately be extended from SH 83 north to I-25 (Figure 1). The ultimate configuration of the roadway will be a freeway with grade-separated interchanges. New sections of roadway would be initially constructed as a four-lane expressway with at-grade intersections controlled by stop signs or traffic signals. In the ultimate configuration, interchanges are planned at eight major crossroads. A minimum 210-foot right-of-way (ROW) width is required. Where interchanges would be built (which require more land than an at-grade intersection), a ROW "footprint" area was determined that is large enough to contain the entire future interchange.

Shoup Road

The design will include the realignment and improvement of SH 83 from the planned Powers interchange to a point north of the Shoup Road intersection (Figure 1). SH 83 improvements will include the crossing of Black Squirrel Creek and the improvement of the drainage structure at that location.

Other Species of Concern Within the Project Areas

Interstate 25

A screening was conducted of species listed as threatened, endangered or of concern by the U.S. Fish and Wildlife Service under the Endangered Species Act (ESA) that may be present in the general vicinity of the I-25 study area. Existing conditions of wildlife and vegetative communities were documented through a combination of direct field surveys, aerial photo interpretation, review of existing literature, and personal communication with leading experts. Wildlife biologists and wetland ecologists conducted field surveys of the study area. The survey included extensive investigation and delineation of vegetation communities and wildlife habitats over a three-month period, extending from September through November 2000. Project ecologists also conducted numerous additional field surveys during the summer of 2002. Project aerial photography and mapping was utilized to identify major natural features. The study area was then traversed for delineation and documentation.

A review by the Colorado Natural Heritage Program (CNHP) Biological and Conservation Datasystem (BCD) for natural heritage resources (occurrence of significant natural communities and rare, threatened or endangered plants and animals) was also

conducted for the study area. Review of this database revealed a total of 31 rare or imperiled species and 9 natural communities that are known to exist in the general vicinity of the study area. Six species of birds, 1 fish, 6 species of insects, 5 species of mammals, 9 natural communities and 14 plant species of rare and/or imperiled status were identified (CNHP, May 14, 2001). The complete list compiled by the CNHP for the project area is presented in Appendix A, Table 1.

Further screening was conducted in 2002 to refine this list and review other data sources to assure that all threatened, endangered and species of concern (TES) that could be found at the project study area were identified. Screening criteria included a review of known populations or habitats, elevation ranges, habitat types and drainage ways. Species have been identified that may potentially be present in the general vicinity of the study area. A brief species profile and presence/absence determination is provided in Appendix A following Table 1.

North Powers Boulevard and Shoup Road at SH 83

Other species of concern within the Powers project area, including Shoup Road, were evaluated in the Powers EA, and details can be found there (URS, 1997). Although Preble's was not listed at the time of that EA, conservation measures were committed to in anticipation of the listing (a bridge was committed to on Pine Creek, rather than a culvert). Other than Preble's, there are no other listed species found in that corridor.

II. PROJECT DESCRIPTION AND IMPACTS TO PREBLE'S HABITAT AND POPULATIONS

Background

Preble's populations are known to exist along Monument Creek and its tributaries in northern El Paso County from approximately the confluence of Cottonwood Creek north to the Palmer Divide and from the foothills on the west to the eastern edges of the Black Forest. Few, if any, areas west of the foothills have been surveyed, but based on positive surveys in Teller County, potential habitat to the west of the foothills may be occupied by Preble's. South of Cottonwood Creek there have been no recent captures of the Preble's mouse despite extensive trapping within suitable habitat along Monument and Fountain Creeks and their tributaries.

Many of the project areas include Preble's habitat. There are two areas in El Paso County where USFWS has issued block clearances, indicating that Preble's are not likely to be present in these areas. The areas are the Colorado Springs greater metro area (centered on Monument and Fountain Creeks) and Cottonwood Creek (USFWS 2000, 2002). All project areas within the block clearance areas were excluded from impact assessment.

Each block clearance has monitoring conditions and a time limit of three years. The USFWS reviews the status of each clearance area at the three year anniversary, and makes a new determination on the status of the clearance. If the status of a clearance area changes in a way that may affect the I-25 project, FHWA and CDOT will consult with USFWS at that time.

All other potential Preble's habitat within the project areas were identified by the following methods:

- Review of Colorado Natural Heritage Preble's database (presence/absence records);
- Field inspections of the project areas;
- Use of Colorado Division of Wildlife riparian mapping;
- Potential habitat on USAFA property was determined from site-specific mapping conducted by Air Force Academy staff (USAFA gave FHWA/CDOT electronic geographic information system (GIS) files of Preble's habitat on the Academy);
- Consultation with USFWS staff; and
- Conversations with expert biologists who have worked within the project areas.

Once habitat locations were identified, specific habitat areas were delineated on a GIS, using the following guidelines:

On non-proposed critical habitat areas, habitat was defined as 300 feet on both sides of a stream from the edge of the stream. None of the habitat areas had designated 100-year floodplains mapped within the project area, with the exception of Jackson Creek. All of the potential disturbances areas at Jackson Creek were within the 300-foot line from the edge of the stream.

In areas where critical habitat was proposed, habitat was defined as 360 feet on both sides of the stream from the edge of the stream (all were first order streams as per USFWS, 2002). There are some areas where proposed critical habitat designations may change in the final rule. It is likely that small areas of critical habitat that were designated within U.S. Air Force Academy property may change to non-critical habitat, as the intent was to exclude all Academy properties from the critical habitat designation. This may reduce Preble's habitat widths on some of the I-25 median areas near the Northgate interchange. However, the wider critical habitat widths were used in this PBA as appropriate, with the understanding that conditions may change in the final critical habitat rule, expected in June 2003.

Air Force Academy properties were reviewed by the project biologist and the USAFA Natural Resource Specialist (Dr. Brian Milbachler) in February 2002. I-25 habitat areas were reviewed in the field by the project biologist, CDOT environmental and engineering staff, design engineers from Wilson and PBS&J, Alison Michael (USFWS) and Brian Milbachler in June 2002. The Powers and Shoup Road projects were field-reviewed in January 2003 with the project biologist and Alison Michael.

Once habitat areas were delineated, project impacts were overlaid on habitat maps to determine specific habitat areas that would be affected. Impact areas were further categorized as either permanent or temporary. The following section is a summary of activities that were proposed at each affected habitat area, and the estimated amount of habitat affected, based upon preliminary design plans. Note that preliminary design plans are at approximately 30% of total design, but design engineers have estimated worst case scenarios for impacts. It is expected that impacts will be further reduced at the time of final design, where more specific minimization techniques and BMPs can be applied.

Although every effort was made to identify specific project impacts, we anticipate minor changes to plans at final design. Changes may include details on equipment access, drainage, and utility placement. Geotechnical data from boreholes may be needed at some project locations. Such details would be included in subsequent Site Specific Biological Assessments, but are anticipated to occur within the project footprints identified here.

Project Descriptions and Impacts at Specific Areas

Specific impact areas for I-25, Powers North, and Shoup Road are given below. Impacts and effects on habitat are summarized in Table 2.

Interstate 25

Pine Creek

I-25 parallels the west side of Pine Creek from about 1500 feet north of North Academy Boulevard to about 2500 feet south of Briargate Boulevard, a total distance of about 6000 feet (Figures 2a and 2b). Pine Creek habitat south of Academy Boulevard will not be affected by the project because of the extensive distance between the creek and I-25 at that point (about 700 feet). North of Academy Boulevard Pine Creek is immediately adjacent to the northbound I-25 lanes. The highway improvements north of Academy Boulevard include two additional lanes in each direction with inside shoulders constructed within the existing open median, and outside shoulder widening on the west side. Impacts will affect habitat adjacent (east) to the northbound lanes (Appendix B, Photo 1). There is no suitable habitat in the median or on the west side of I-25 in these areas. The new east edge of pavement will generally match the existing edge of pavement along the southerly half of this reach. The new pavement edge will be about 5 feet to the west of the existing edge of pavement along the northerly half of this reach. The highway embankment side slopes will also be improved for roadside safety.

Construction will be done in two stages. First, all traffic will be shifted to one side of the existing highway, either northbound or southbound, while the other side is being fully constructed. When the improvements are finished on the first side, all traffic will be shifted to that side and the construction of the other side will be completed. It is possible this staged construction will be completed as two separate construction projects.

Potential habitat areas include 300 feet on each side of Pine Creek, because it was not designated as critical habitat. The habitat ends at the 15-foot-wide mowing strip adjacent to the east edge of pavement of the existing highway. The area of permanent impact to the habitat is the area between the east edge of the mowing strip of the existing highway and the east edge of the 15-foot-wide mowing strip next to the new highway. Widening here will increase the habitat area 0.2 acre (gain of 0.2 acre), since the east edge of pavement of the new highway will be constructed either at the existing edge of pavement or shifted to the west. The remainder of the disturbance area was designated as temporary impact, since it will be revegetated with native plantings and maintained in a natural condition. There will be 3.3 acres of temporary impact.

Kettle Creek

Kettle Creek crosses I-25 about 900 feet north of Briargate Boulevard; the Creek flows through a 108-inch diameter reinforced concrete pipe that is about one-half mile long and about 50 feet below the highway. This pipe is the outlet for the Kettle Creek Dam that was constructed by the USAFA to reduce flood discharges downstream. The dam is an earthen embankment about 70 feet high with 3 to 1 slopes, and large riprap on the upstream face. The emergency spillway is also constructed of large riprap, and is located at the southerly end of the dam discharging into the Pine Creek drainage basin.

The highway improvements in this reach include one additional lane in each direction with shoulders constructed within the existing open median and minor shoulder widening on the east side (Appendix B, Photo 2). The highway embankment side slopes will also be improved for safety.

Construction will be completed in two main stages, as described for Pine Creek.

The habitat areas include 300 feet on each side of Kettle Creek, since this section of the Creek was not designated as critical habitat. The habitat ends on both sides of the existing highway at the 15-foot-wide mowing strip adjacent to the edges of pavement. The area of permanent impact to the habitat is the area between the edges of the mowing strips of the existing highway and the edges of the 15 feet wide mowing strips next to the new highway. The remainder of the disturbed habitat will have temporary impacts. The permanent impact at Kettle Creek will reduce the habitat area 0.1 acre, and there will be 0.4 acre of temporary impact (see Figure 3).

FHWA/CDOT are also considering installing a new culvert to create a habitat linkage on the north side of the dam (see Conservation Measures, Section VI).

Black Squirrel Creek South

Black Squirrel Creek South crosses I-25 about 3850 feet north of Interquest Parkway through a divided median. The existing crossing is a separate 3-span bridge for both the northbound and southbound roadways, each having a total span length of about 105 feet and a clearance of 15 feet. The existing median opening is about 24 feet wide.

The highway improvements in this reach include one additional lane in each direction with shoulders constructed on the outside of both the northbound and southbound roadways. The existing open median will remain. The highway embankment side slopes will also be improved for safety. Separate new bridges will be constructed for both the northbound and southbound roadways (Appendix B, photo 3). The new bridges will likely be multi-span that have a total span length of about 120 feet and will maintain the existing clearance of about 15 feet. The bridges will be about 63 feet wide with about a 24-foot-wide median opening.

Construction will be done in two main stages, as described for Pine and Kettle Creeks. The habitat areas include 360 feet on each side of Black Squirrel Creek South (the critical habitat width). The habitat ends on both sides of the existing highway at the 15-foot-wide mowing strip adjacent to the edges of pavement. The area of permanent impact to the habitat is the area between the edges of the mowing strips of the existing highway and the edges of the 15 feet wide mowing strips next to the new highway. The remainder of the disturbed habitat will be considered a temporary impact area because it will be revegetated with native plantings, and then maintained in a natural condition. The permanent impact at Black Squirrel Creek South will be 1.2 acres. The temporary impact will be 2.1 acres (see Figure 4).

Black Squirrel Creek North

The Black Squirrel Creek North drainage is about 1000 feet north of the Black Squirrel Creek South drainage, and 0.75 miles south of Monument Branch drainage. I-25 will be widened from two lanes to three lanes in each direction, with construction to the outside of the existing pavement (to protect habitat in the median). The new construction will occur at the existing I-25 grade (elevation) and location. Additional widening will be required for the Powers Boulevard northbound to southbound I-25 ramp connection. This ramp connection requires an acceleration lane that will add 12 to 24 feet of widening to the southbound I-25 lanes. An additional 12 feet of widening on the northbound I-25 lanes for the ramp from I-25 northbound to Powers Boulevard southbound is also required.

In addition to pavement reconstruction and widening, hydraulic structures will be replaced or extended. Some of these structures are located within mouse habitat areas. There are two existing 12 foot by 10 foot concrete box culverts (CBCs) just north of Black Squirrel Creek (Appendix B, photo 4). These structures will require significant extensions and some rehabilitation work on both sides of the structure. This construction will also create a permanent impact to habitat in this area, as well as temporary impacts for work areas and a construction access road.

The total permanent impact area from pavement and CBC widening is 1.0 acre, with a temporary impact of 3.1 acres. Project boundaries are shown in Figure 5, from north of Black Squirrel Creek to south of Monument Branch.

Monument Branch at Powers Boulevard/I-25 Interchange

The limits of work in this area are from south of Monument Branch extending north to south of Smith Creek. Work on this section includes the widening and reconstruction of I-25 and a new freeway-to-freeway interchange at I-25 and Powers Boulevard.

Powers Boulevard is a major north-south highway that runs along the eastern edge of Colorado Springs, Colorado. Powers Boulevard is planned to intersect I-25 approximately one-half mile south of the existing Northgate interchange. Powers Boulevard will connect to I-25 through a series of direct connecting ramps. In addition, there will also be direct access from Powers Boulevard to Northgate Boulevard (see Figures 5 and 6 for interchange configuration). The interchange will be constructed below existing I-25 grade, resulting in cuts into the existing terrain.

I-25 will be widened from two lanes to three lanes in each direction. In addition to the new lanes, there will be additional lanes required to accommodate acceleration and deceleration lanes for the entrance and exit ramps to I-25 from the Powers Boulevard interchange.

Habitat impacts from the construction of the Powers/I-25 interchange are due to cuts and fills and pavement widening and reconstruction. New ramps will be constructed for the development of the interchange. There is a small, unnamed habitat area approximately 600 feet north of the edge of Monument Branch (see Appendix B, Photo 5). This habitat is currently defined in two areas. The area on the east side of the northbound I-25 pavement will be impacted due to I-25 pavement widening and reconstruction, and construction of the new northbound I-25 to southbound Powers Boulevard ramp. The habitat area in the existing I-25 median will be impacted primarily because of the new northbound Powers Boulevard to southbound I-25 ramp. Pavement widening of I-25 will be to the outside of the existing northbound and southbound I-25 lanes to reduce impacts to median habitat.

At northbound I-25 at Monument Branch there are two existing 10 foot by 12 foot CBCs. These structures will be extended on the east end to accommodate the pavement widening in this area (see Figure 5 and Appendix B, Photo 6).

There are two existing 10 foot by 12 foot CBCs at southbound I-25 at Monument Branch. These structures will be extended on the west end to accommodate pavement widening in this area. There will also be rehabilitation work on the existing wing walls on the east side of the structures (see Figure 6).

There is an existing 6 foot by 7 foot CBC at northbound I-25 approximately 1,050 feet north of Monument Branch. This structure will be extended on the east side and will affect habitat (see Figure 6).

Permanent impacts to habitat due to pavement widening, new ramp construction, roadway fills/cuts, and structure widening for the Monument Branch area will affect 3.5

acres. The area of temporary impacts is 6.1 acres. There may be opportunity to enhance the median area of I-25 south to connect to the Monument Branch habitat area as mitigation for the impacts in this area. This will be further evaluated during the final design process.

Smith Creek at Northgate

The limits of work in this area include the widening and reconstruction of I-25 and reconstruction and reconfiguration of the existing Northgate Boulevard and I-25 interchange to accommodate the Powers Boulevard connection. Smith Creek is located approximately 900 feet south of Northgate Boulevard. The impacts to habitat are due to I-25 widening and reconstruction and the construction of new ramps for the Northgate Boulevard and I-25 interchange (see Figure 6). The habitat area between the Santa Fe Trail and the southbound I-25 lanes will be affected due to the construction of new ramps for Northgate Boulevard to southbound I-25 and from Northgate Boulevard to the southbound I-25 to southbound Powers Boulevard ramps. Additionally, southbound I-25 will be widened to the outside in this area. The I-25 median area will be impacted on the west side in order to construct the fill slopes for southbound I-25 (Appendix B, Photo 8).

The area to the east of the I-25 northbound lanes will also be impacted. These impacts are a result of the new interchange ramps for Northgate Boulevard and Powers Boulevard. The new ramp from northbound Powers Boulevard to the Northgate Boulevard ramp will bisect the existing loop ramp for Northgate Boulevard to northbound I-25. There will also be a new ramp from northbound Powers Boulevard to northbound I-25 that will parallel northbound I-25 and connect to I-25 north of Northgate Boulevard. Finally, there will be a new ramp from northbound-I-25 to Northgate Boulevard.

There are two large CBC structures located at Smith Creek under the existing I-25 lanes (Appendix B, Photo 7). These structures will be extended to accommodate the roadway widening in these areas. In addition to the existing CBCs, new CBCs will be constructed to accommodate the stream flows under the new interchange ramps.

The permanent impact area due to pavement widening, new ramp construction, roadway fills/cuts, and structure widening for Smith Creek area is 6.2 acres. The temporary impact area is 4.0 acres. The area of the existing loop ramp on the southeast quadrant of the existing Northgate interchange may be a possible location for habitat mitigation. This will be further evaluated during the final design process.

Black Forest Tributary

The limits of work in this area are from north of Northgate Boulevard extending north to Black Forest Tributary and are shown in Figure 6.

I-25 will be widened from two to three lanes in both directions. The widening of I-25 will occur to the outside of the existing pavement and the existing pavement will be reconstructed (there is no room to widen to the inside). The new construction will occur at the existing I-25 grade (elevation) and location. Additional widening will be required for the Northgate Boulevard ramps to I-25.

There are two existing 10 foot x 10 foot CBCs at Black Forest Tributary (Appendix B, Photo 9). These structures will require significant extensions on both sides. The CBC extensions and the roadway widening will create a permanent impact to habitat in this area as well as temporary impacts for the construction. All temporary impact areas will be re-vegetated.

The permanent impact area due to pavement widening, roadway fills/cuts, and structure widening for the Black Forest Tributary area is 0.3 acres. The temporary impact area is 1.0 acre.

Baptist Road and Jackson Creek

The limits of work in this area are from north of the Black Forest Tributary to Baptist Road and are shown in Figure 7.

I-25 will be widened and reconstructed from two lanes to three lanes in each direction including improved shoulders. The widening will be to the outside of the existing lanes in this area (there is no room to widen to the inside). Baptist Road will be reconstructed to six lanes with raised median and curb, gutter, and sidewalk beyond the roadway edges. The Baptist Road / I-25 interchange will be reconstructed with new ramps. There is an existing two-lane frontage road on the east side of I-25, which will be eliminated. A new frontage road will be constructed that will intersect Baptist Road at Jackson Creek Parkway. The new frontage road will extend south and connect with the existing frontage road, south of Jackson Creek (see Figure 7 and Appendix B, Photo 10).

The new frontage road will affect habitat on the east side of an existing FHWA/CDOT conservation area. The profiles of the frontage road were designed to minimize the impact to the habitat area.

The Jackson Creek floodplain currently crosses both Baptist Road and I-25. The crossing structure at I-25 is a 29 by 18 foot CBC with a natural bottom. This structure will be extended on both sides to accommodate roadway widening in this location. Two 36-inch corrugated metal pipes cross under the existing frontage road to carry water to this structure. There is evidence that the flow from Jackson Creek is currently overtopping the frontage road during significant rainfall events. The frontage road will be removed in

this location. There will be channel improvements made to Jackson Creek upstream of the 29 foot by 18 foot CBC. These improvements will allow for improved habitat conditions and will facilitate mammal crossing of I-25 in this location. There will be impacts to the existing habitat area on the west side of I-25 due to the extension of the existing structure and the roadway fill required for safe side slopes.

At the Baptist Road crossing, the roadway will be widened and a new hydraulic structure placed under the road, affecting habitat. CDOT/FHWA are considering a drainage detention structure on the upstream side (north) of Baptist Road to help control the significant erosion problem that has resulted from private development and construction up-gradient of the CDOT conservation area.

Permanent habitat impacts due to pavement widening, new roadway construction, roadway fills/cuts, and structure widening for the Jackson Creek area amount to 7.7 acres, and the temporary impact area is 4.6 acres. The temporary areas impacted will be re-vegetated after completion of the roadway construction. The area of the existing frontage road that will be removed may then be used for potential habitat mitigation and the area could be enhanced. This created/restored/enhanced habitat area is estimated at 3.6 acres.

Teachout Creek

Teachout Creek crosses I-25 about 5900 feet north of Baptist Road. The existing crossing is a double 10 foot wide by 10 foot high concrete box culvert that passes under the northbound and southbound roadways and the open median, and has a total length of about 125 feet.

The highway improvements in this reach include additional lanes and shoulders constructed on the both the east and west sides, and some minor shoulder widening in the existing median (non-habitat area). The open median will remain. The highway embankment side slopes will also be improved for safety. The existing culvert will be extended about 35 feet to the west and about 40 feet to the east, for a total completed length of about 200 feet (Appendix B, Photo 11).

Construction will be done in two main stages as described before.

The habitat areas include 360 feet on each side of Teachout Creek (the critical habitat width). The habitat ends on both sides of the existing highway at the 15-foot-wide mowing strips adjacent to the edges of pavement. The area of permanent impact to the habitat is the area between the edges of the mowing strips of the existing highway and the edges of the 15 feet wide mowing strips next to the new highway, and the area to be covered by the culvert extensions. The permanent impact at Teachout Creek will be 1.1 acres, and the temporary impact will be 1.4 acres (see Figure 8).

North Powers Boulevard

Powers Boulevard will cross Black Squirrel Creek approximately 0.30 miles north of the proposed interchange with SH 83. The crossing will allow for construction access from both sides of the creek to minimize channel disturbance (Appendix B, Photo 12).

The design includes a multiple bridge structure that will cross Black Squirrel Creek in a configuration similar to that of the previous design for the Kettle Creek bridges. The structures will be approximately the same height above the creek bottom and it appears that it will require a 3-span girder bridge design (it is estimated that bridge clearance will range from 20 to 70 feet above the stream). Bridge abutments were placed to limit the impacts to habitat. The placement also reduces the height of the fill sections. Currently the south banks of the channel have steep vertical cuts. These banks will be graded to gentler slopes that will be easier to revegetate.

Drainage will be designed in accordance with CDOT standards. The resulting drainage flow volumes that reach the creek will have controlled outlets and will not have a significant impact to the area.

The initial construction will require access from both the north and south ends of the bridge. Access to the south side will be from SH 83. Access to the north side will be from the Powers right-of-way, or easements obtained from the developer. Crane pads and the access road for the delivery of the girders will have impacts within riparian habitat. The access road and pads are required for placement of the girders, construction of the piers, and concrete pump trucks.

Temporary impacts due to construction have been minimized. The impact areas were measured within the 360-foot-wide habitat area, measured from the bank of the normal flow channel. The impacts will include the placement of the roadway fill, work area needed for construction, access road and crane pads for placement of the steel girders. The temporary disturbance area is estimated at 6.36 acres (see Figure 9).

Permanent impact areas due to the proposed Black Squirrel Creek bridge include the permanent roadway fills within the 360-foot-wide habitat area. In addition, pier and wall structures were tallied as permanent impact areas. The permanent disturbance area is estimated at 2.25 acres (see Figure 9).

Shoup Road at SH 83

The design will include a realignment and improvement of SH 83 from the Powers interchange to a point north of the Shoup Road intersection. SH 83 improvements will include the crossing of Black Squirrel Creek and the improvement of the drainage structure at that location (Appendix B, Photos 13 and 14).

The existing structure is a 15-foot-diameter metal pipe that may be replaced, or an additional pipe constructed parallel to the existing one to accommodate the design flows

crossing under SH 83. The drainage will be directed under SH 83 using a series of culvert pipes or a single-span bridge to keep the flows in the channel of the Black Squirrel Creek instead of topping the roadway.

SH 83 crosses Black Squirrel Creek approximately 0.75 miles north of Powers Boulevard. The structure selection is not final, but if the structure is a bridge, it will be a single-span structure that will extend approximately 80 feet across the creek and will accommodate 5-to-12-foot travel lanes with 10-foot outside shoulders for the SH 83 improvements. Minimal impacts to the main channel will be necessary to construct the abutments and fill sections. Additional impacts will occur should the structure include adding pipes or a box culvert structure. The impacts described in this report are for the pipe or box structure and may be reduced during the final design once a structure is selected.

Temporary impacts due to construction will be minimized to the extent possible. Construction will be accomplished from the existing roadway and west of the existing alignment. Grading and access roads will have a temporary impact to the habitat area. The temporary disturbance area is estimated at 3.84 acres (see Figure 9). All temporary impact areas will be revegetated.

Permanent impacts will include the placement of additional roadway fill and pavement, construction of any channel structure, walls and rock riprap. Current roadway, drainage structures and mowed areas next to the existing roadway were subtracted from the totals as an existing impact area. The permanent impact areas due to the proposed roadway and drainage structure improvements were quantified for the area within the 360 ft habitat area either side of the channel bank normal flow line. The permanent disturbance area is 2.35 acres.

Areas of Non-Habitat

There were several potential habitat areas within the corridor that were classified as non-habitat for a variety of reasons. These areas included:

- All highway shoulders along I-25 within 15 feet of pavement (these grassy strips are regularly mowed);
- All paved or dirt roads;
- Most highway medians that clearly did not contain Preble's habitat (the area around Northgate was an exception);
- All currently paved areas within potential habitat;
- The Colorado Springs block exclusion area. This is a 9.34-mile stretch of Monument and Fountain Creeks, beginning in the north from the I-25 crossing of Monument Creek, continuing southward to the Monument/Fountain Creek confluence, and continuing south to the wastewater treatment plant, about one mile south of the Nevada Avenue bridge over Fountain Creek (USFWS, 2000);
- The Cottonwood Creek block exclusion area (USFWS 2001);

- Areas on North Powers Boulevard, with the exception of the Black Squirrel Creek bridge crossing. These areas were field reviewed with USFWS staff on January 21, 2003. There was concern about one potential habitat area on Powers Boulevard about 0.25 miles east of the Voyager Parkway crossing of Monument Branch. Although there was no suitable habitat at the crossing, there was potential habitat just downstream of the project area. Although no impacts are anticipated at this location, FHWA/CDOT will consult with the USFWS on the status of this area during construction planning if FHWA/CDOT build this section of roadway. If there are future impacts to habitat and they fall within the limited take amount permitted in the Programmatic Biological Opinion, no additional conservation measures would be required; and

- An area on Monument Creek just north of the I-25 bridge in Colorado Springs. There will be improvements to the Rockrimmon interchange and frontage road, and this area is just north of the Colorado Springs Block Clearance area. This channelized section of Monument Creek is being monitored for Preble's as a condition of the Colorado Springs block clearance. FHWA/CDOT will consult with the USFWS on the habitat status of this area during construction planning. If there are future impacts to habitat and they fall within the limited take amount permitted in the Programmatic Biological Opinion, no additional conservation measures would be required.

Table 2. Proposed Construction Activities and Associated Habitat for Preble's Meadow Jumping Mouse Programmatic Biological Assessment, El Paso County, Colorado

Site	Permanent Impact (acres)	Temporary Impact (acres)	Activities	Habitat Description at Impact Areas
Pine Creek	0.0 (0.2 acre recovered)	3.3	New lane, east side I-25, minor drainage culverts, construction access	Poor upland habitat adjacent to roadway on east side I-25 (many bare areas with weedy cover)
Kettle Creek	0.1	0.4	New lanes both sides, construction access	Poor upland habitat adjacent to roadway. On east side of I-25, habitat is between I-25 and Kettle Creek dam. On west side, upland habitat on side of road.
Black Squirrel Creek South	1.2	2.1	New lanes both sides, new multi-span bridges to replace two existing bridges, construction access.	Impacts will affect both riparian habitat in stream channel and upland grassland on edge of highway. Good riparian vegetation with extensive cattail (*Typha latifolia*)/sandbar willow (*Salix exigua*) stands and scattered cottonwood trees (*Populus deltoides*).
Black Squirrel Creek North	1.0	3.1	New lanes both sides, extend existing side by side CBCs, construction access. The existing La Foret Trail will remain.	Uplands with ponderosa pine (*Pinus ponderosa*), snowberry (*Symphoricarpos occidentalis*), Gambel oak (*Quercus gambelii*), graminoids, will be affected by temporary and permanent impacts. Riparian area is either pure willow stands (east side) or pine/willow (west side), and both will also be affected by permanent and temporary impacts.

Table 2 (cont'd.) Proposed Construction Activities and Associated Habitat for Preble's Meadow Jumping Mouse Programmatic Biological Assessment, El Paso County, Colorado

SITE	Permanent Impact (acres)	Temporary Impact (acres)	Activities	Habitat Description at Impact Areas
Monument Branch, including Powers/I-25	3.5	6.1	New lanes both sides, auxiliary lanes for Powers, extension of separate culverts on east and west sides of I-25, and at location on east side of I-25 north of Monument Branch, construction access	East side has willow/graminoid stands with pine/oak uplands. Median has willow-lined channel with pine/oak uplands. West side has willow/cattail in channel.
Smith Creek at Northgate	6.2	4.0	New lanes both sides, new ramps, extend existing side by side CBCs on east and west sides of I-25, new CBCs under new ramps, detention pond in median, construction access.	Habitat on west side of I-25 is crack willow trees (*Salix fragilis*) with willow understory. Heavy beaver activity. Uplands include smooth brome (*Bromus inermis*) near roads, little bluestem (*Schizachyrium scoparium*) and blue gramma (*Bouteloua gracilis*) away from road. Median has mature crack willow with cattail and willow stands with beaver activity. Toadflax (*Linaria dalmatica*) and Russian-olive (*Elaeagnus angustifolia*) present. East side also crack willow trees/graminoid understory, with channel lined with cattail about 30 meters from CBC.

Table 2 (cont'd.) Proposed Construction Activities and Associated Habitat for Preble's Meadow Jumping Mouse Programmatic Biological Assessment, El Paso County, Colorado

SITE	Permanent Impact (acres)	Temporary Impact (acres)	Activities	Habitat Description at Impact Areas
Black Forest	0.3	1.0	New lanes both sides, extend existing side by side CBCs on east and west sides of I-25, construction access	There will be permanent impacts to poor-moderate quality upland grasslands along the road and near the existing CBC, which has willow and snowberry cover near the entrance. There is a small beaver dam near the west culvert entrance. Existing culvert has skylight.
Jackson Creek and Baptist Road	7.7 (up to 3.6 acres recovered)	4.6	New lanes both sides of I-25, extend existing CBC. Baptist Road will be widened to six lanes (from current two), with a new culvert at Jackson Creek. Existing frontage road will be eliminated, replaced by new Jackson Creek Parkway on east side of 65-acre CDOT conservation property.	Habitat east side of I-25 is restricted by frontage road and CBC under I-25, which is paved in places. West side I-25 has extensive willow stands with tree cover. Sideslopes of I-25 generally are weedy grasslands. Impact area along Baptist Road includes heavy willow stands near Jackson Creek crossing, oak uplands elsewhere. New Jackson Creek Parkway area is upland habitat with oak/graminoids.
Teachout Creek	1.1	1.4	Additional lanes (east and west sides), lengthen CBC	Small drainage with limited flow; some willow shrub cover near frontage road and culvert entrances mixed with tall graminoids. West side outside of right-of-way heavily grazed. Impacts to grassland habitat adjacent to road and shrubs near culverts entrances.

Table 2 (cont'd.) Proposed Construction Activities and Associated Habitat for Preble's Meadow Jumping Mouse Programmatic Biological Assessment, El Paso County, Colorado

SITE	Permanent Impact (acres)	Temporary Impact (acres)	Activities	Habitat Description at Impact Areas
Powers Boulevard North	2.25	6.36	New highway over Black Squirrel Creek with multiple bridge structures, disturbed uplands, construction access.	Downcut channel has very poor riparian vegetation cover, healthy upland grasslands.
Shoup Road at SH 83	2.35	3.84	Relocation and widening of SH 83, new culvert or bridge under road, construction access.	Good willow/herbaceous wetland vegetation on east side of SH 83 will have minimal effects; habitat on west side has downcut channel with very poor riparian vegetation cover.
TOTALS	**25.70**	**36.20**		

III. SCHEDULE

Project construction schedules are contingent on available funding, which is unknown at this time. It is anticipated that construction for all projects will run from Spring of 2004, and last 4–10 years, finishing in 2014. To afford maximum flexibility in scheduling, FHWA/CDOT request the option of a project time extension if the need arises, recognizing that USFWS will review the status of the PBA/biological opinion at that time.

This PBA will result in a programmatic biological opinion (PBO) from the USFWS. We anticipate that the PBO will be issued in late May–early June, 2003. This PBO will be needed prior to the decision document for the EA for I-25, which is scheduled for mid-2003.

IV. BIOLOGICAL SETTING, GOALS, ISSUES, AND IMPACTS

Background

Biological information on Preble's was collected and reviewed by an expert panel (Panel) of biologists and natural resource professionals in 2000 and 2001, including a representative from USFWS (Bakeman and Meaney, 2001). The panel reviewed impacts to Preble's from the I-25 project; Powers North and Shoup Road were not specifically discussed there. However, Preble's distribution and habitat data were reviewed from all potential project areas within the Monument Creek watershed, as well as adjacent areas to the north in the South Platte watershed in Douglas County. Therefore, panel recommendations and strategies had broad applicability to biological considerations on all three projects. Many of the biological considerations presented in this PBA are based on discussion and recommendations that were made during the Panel process. However, the panel did not evaluate all issues to the level of detail that was necessary to complete the PBA; all panel recommendations and priorities are specifically referenced.

General Preble's Habitat Conditions

The Preble's meadow jumping mouse occurs in Colorado and southeastern Wyoming and has been listed as threatened throughout its range. In Colorado, it occurs in riparian habitat (vegetation in close contact with the water table) and associated upland grasslands in the piedmont, from Larimer to El Paso counties. In El Paso County, Monument Creek and its tributaries form the stronghold of the southernmost population of Preble's meadow jumping mice. I-25 crosses eleven of these tributaries, although some are only ephemeral draws with infrequent flow. Of these tributaries, almost all have been live-trapped and jumping mice have been found.

Both Shoup Road at SH 83 and Powers North are on Black Squirrel Creek, and Preble's have been confirmed on the west side of SH 83 in very low numbers (Clint Miller, personal communication). Preble's are found in much higher densities on the east side of SH 83 (Ensight 1998).

Typical habitat for the Preble's meadow jumping mouse in Colorado consists of a matrix of riparian vegetation with associated upland grasslands (Armstrong et al. 1997, Shenk and Sivert 1998). Typically, the riparian vegetation component has variable composition, but shrub patches with scattered tree overstory are common. The woody vegetation usually has a heavy understory of graminoids or herbs, and woody or leaf litter is often abundant. The common vegetation theme in riparian areas is heavy cover with minimal open areas. Preble's habitat within a drainage may not be continuously occupied, with occupied riparian patches with thick cover interspersed with more open patches. However, mice may still use these open patches for dispersal routes between the occupied patches.

Upland habitat types include a variety of mid-to tall-grass types that often have upland shrub patches. Alfalfa fields are also used in some situations. These grasslands are usually at higher elevations than the immediate flood plain, and would not be flooded during regular flood events, unlike much of the lower elevation riparian habitat.

It is known that riparian habitat functions as the primary mouse nesting areas, but feeding, mating, hibernation, and dispersal are known or strongly suspected in these areas as well. Upland habitat contains the primary hibernation sites, often in association with upland shrubs. Mice are known to feed in upland areas during evening hours, and social gatherings with unknown implications have also been observed here.

Many of the occupied streams have suitable riparian vegetation at their confluences with Monument Creek and for 1 to 3 miles upstream. Most streams affected by the projects have headwaters (source areas) in the Black Forest east of Monument Creek, where ponderosa pine is the primary cover type. Although Preble's have been captured in ponderosa pine communities, it is likely that mouse distribution is patchier with lower densities in these forest types, which do not support the abundant understory cover found in riparian communities.

The project areas are within the Monument Creek watershed in El Paso County, itself a part of the larger Arkansas River watershed. All of the drainages within the three project areas are positioned on the south side of the Palmer Divide, a watershed divide that separates the South Platte and Arkansas watersheds. I-25 is located east of Monument Creek, at a distance of 0.8 miles at the northern end, to 0.1 miles at the southern end. Tributaries of Monument Creek include several first-order streams and ephemeral drainages. The smaller drainages in the corridor are barely more than wet swales that support patches of wetland vegetation, and have ill-defined channel cross-sections. Flow is intermittent during the growing season. Black Forest Tributary and Teachout Creeks typify these conditions.

The moderate-sized creeks include Monument Branch, Smith, Jackson, and Dirty Woman Creeks. Flow is permanent, but may be reduced to a trickle during the latter part of the growing season. Channel width varies from less than 3 feet to greater than 33 feet, and channel depth is generally moderate (<1.5 feet), but may include sections that are more deeply incised. These creeks have floodplains that are usually less than 160 feet wide, but may extend to almost 328 feet.

Cottonwood, Pine, Kettle, and Black Squirrel Creeks are the larger drainages in the project areas. All have well-defined channels that are generally less than 33 feet wide, but can exceed 100 feet in places. Some of the upper stretches of Black Squirrel Creek are primarily dry gulches with upland shrub cover. Most of these creeks also have deeply incised sections, which are probably due to both naturally erosive soils and increased flow from urbanizing influences in their watersheds. Pine, Cottonwood, and Kettle Creeks all have sections that are so deeply incised that they are referred to as canyons (in some cases, the channel is more than 66 feet deep).

General Biological Goals

The following biological goals for Preble's were drafted by the Preble's Panel, and were based on goals by scientists and regulators on the Nature Conservancy Preble's Science Team (Page and Gruneau, 2000). These goals were used as guidelines in prioritizing Preble's issues and conservation strategies, reducing impacts, and determining mitigation actions. For a more detailed discussion, see Bakeman and Meaney (2001).

- Keep Tributary Populations Whole
- Maintain Upland Habitat
- Maintain Connectivity Between Populations
- Keep Populations Stable
- Maintain Geographic Variability
- Maintain Ecological Variability
- Be Conservative
- Look at the Big Picture

Biological Issues

The Preble's Panel discussed all relevant biological issues that might affect Preble's in the Monument Creek watershed. Three factors were considered especially important: population genetics, population dynamics, and habitat connectivity. These factors are summarized below; more detailed discussion is found in Bakeman and Meaney (2001).

Population Genetics and Evolution

Maintaining genetic diversity both within and among populations is an important part of species conservation. When a large population is fragmented through habitat destruction, and only small isolated populations are left, genetic diversity will likely be reduced (Meffe and Carroll 1997). Genetic diversity in a population is essential to ensure that sufficient variability is present to enable a population to avoid inbreeding (resulting in reduced viability of individuals) and maintain evolutionary potential, which is the ability to respond to changes in the environment. Such environmental changes over time are inherent in any natural, dynamic system. Maintaining the highest level of variation now will reduce the probability of extinction from environmental changes later. Maintaining genetic diversity is therefore an important component of species conservation because it provides the raw material for species to change in response to a changing environment.

The goals of keeping tributary populations whole (General Biological Goal 1), maintaining connectivity (Goal 3), and maintaining population stability (Goal 4) are critical to maintaining genetically healthy populations. Genetic variation can be maintained within healthy genetically variable populations with surprisingly little genetic exchange.

Preble's have declined across the Front Range. This loss of animals has likely resulted in a loss of genetic variation. The exact levels lost may never be known, because data are

not available. However, there have been large declines in animal numbers, and it is reasonable to assume that some genetic variation was lost; this may negatively affect the evolutionary potential of the mouse. It is critical to preserve large populations that are geographically dispersed over the range of the mouse. This strategy will preserve the greatest amount of genetic variation and therefore the greatest evolutionary potential. Genetic variation is related to population size (Frankham 1996). Higher levels of genetic variation can be maintained in a single large population than a single small population. Therefore it is more important to preserve large populations over small ones.

Several small populations are more likely to maintain higher levels of genetic variation than a single large population. A single devastating flood could nearly eliminate the large mouse population on Monument Creek, and the smaller populations on the tributaries would contain the reservoir of genetic diversity that would be needed to repopulate Monument Creek. Therefore, populations along the tributaries are very valuable. Protecting Monument Creek alone is not enough, and the smaller populations found in the project areas are important to the survival of the mouse in the greater watershed.

In general, greater geographic distance results in greater genetic distance. This project is located within the boundaries of the southernmost population of Preble's meadow jumping mice. Within this large population, Pine Creek and Kettle Creek contain the southernmost subpopulations. It is important to preserve the most southern large population, and within that to preserve the southernmost drainages.

Population Demographics

Population demography is concerned with the births, deaths, survival, age, immigration and emigration of individuals, and their effect on the size and stability of populations.

A population is a small group of individuals that live in close proximity and have a high probability of mating and producing offspring. In recent years, scientists have used the term metapopulation to describe a pattern of animal distribution. A metapopulation consists of several subpopulations linked together by immigration and emigration (Meffe and Carroll 1997). A given subpopulation may become extinct in a patch of habitat, but the patch subsequently will be recolonized by emigrants. In order for a system to fit this model, it is necessary that corridors among subpopulations be preserved so that each patch can be recolonized.

It is unknown whether jumping mouse populations in Colorado fit this metapopulation model. However, they appear to be good dispersers (see below), which suggests that in the fragmented habitat of Colorado, Preble's meadow jumping mouse populations may function in this manner.

Small populations are more susceptible to extinction than large populations (Pulliam and Dunning 1997). The issue of what is "large" or "small" is much less clear. The Panel adopted the standards of the Nature Conservancy Science Team, where a small

population was considered in the low hundreds of individuals (less than 500 individuals), medium populations had numbers of 500-2499, and a large population had more than 2500 animals. These population classes have also been adopted by the Preble's Recovery Team (USFWS, 2001).

Preble's population densities have been estimated at several Colorado locations; details on methods and locations are given in Bakeman and Meaney (2001). The following drainages have Preble's density estimates:

- Monument Creek (from USAFA and from a few sites near the Monument/Dirty Woman Creek confluence);
- Dirty Woman Creek;
- Jackson Creek;
- Black Squirrel Creek;
- Kettle Creek; and
- Pine Creek.

Density estimates vary considerably between sites and within sites in different years. However, Monument Creek on the USAFA appears to have the highest densities in the county. Rob Schorr with Colorado Natural Heritage Program (CNHP) estimated total numbers of Preble's on the Air Force Academy ranged from 670-1338 animals in June 1998 to 243-676 animals in June 1999 (CNHP 2001).

The remainder of the sites have average densities that range from 3 to 42 animals km^{-1} stream.

Preble's populations are not distributed continuously on Monument Creek and its tributaries. Although the Panel discussed possible divisions among Preble's populations in El Paso County, these ideas were refined for this PBA. There are likely six (or more) distinct populations in the Monument Creek watershed. They are:

1. Monument Creek North. 63.5 miles of stream habitat.

Preble's habitat on Monument Creek on a private ranch extends from Baptist Road south for about 1.76 km. This habitat is heavily grazed by cattle, and although there is considerable riparian shrub cover, shrubs have been reduced to a height below 5 centimeters tall (not effective as cover or food for Preble's). Live-trapping for small mammals in summer 2002 did not result in Preble's captures on the ranch, although Preble's were captured on adjacent properties north and south of the ranch. These data indicate that Preble's do not reside on the Monument Creek ranch property and that they do not move through the property, separating the Preble's population south of the ranch from the northern population. The Monument Creek north population also includes animals from the connected drainage of Dirty Woman, as well as small unnamed side drainages between the towns of Palmer Lake and Monument. It is also possible that the northern Monument Creek population is split in two, with separate populations based on the northern and southern side of Monument Lake (based on negative trapping surveys on

the north and south ends of the lake, Mike Bonar, personal communication). A habitat restoration project by 2002 may remedy this apparent barrier.

2. Teachout Creek 5.23 miles of stream habitat.

Teachout Creek is a small, ephemeral stream that supposedly drains into Monument Creek about 0.8 km north of Baptist Road on the Willow Springs Ranch. However, a field visit to the ranch in September 2002 revealed that there is not a viable habitat connection between these two streams. Teachout Creek flows through a residential area near the active railroad track, becomes a grazed, grassy swale, and flows into a terminal pond about 0.25 miles short of Monument Creek. Although Preble's could travel from the pond to the creek, it is more unlikely that they do not make it to the pond from the disturbed upstream areas. Preble's on this stream should be considered a small, isolated population.

3. Beaver and Hay Creeks 33.8 miles of stream habitat.

Hay Creek flows into Beaver Creek about 0.4 km west of Monument Creek on the Dellacroce Ranch, and the latter flows into Monument Creek. The Beaver/Monument confluence area was live-trapped as part of the summer 2002 Dellacroce Ranch project, with negative results. Preble's are known upstream on Beaver Creek around and above the Forest Lakes reservoir. These animals should be considered a small population that is not connected to Monument Creek.

4. Monument Creek South 211.3 miles of stream habitat.

This stream and associated tributaries probably contain the largest numbers of Preble's of any of the El Paso county populations. This population consists of individuals on Monument Creek (primarily on USAFA property), and several Monument Creek tributaries: Jackson, Black Forest, Smith, Monument Branch, Black Squirrel, and the western tributaries on the Academy. One known exception on the Academy is Lehman Run, but that is the subject of recent habitat restoration actions. The highest Preble's densities in the county are reported on Monument Creek on the USAFA.

5. Kettle Creek 67 miles of stream habitat.

Kettle Creek is a southern tributary of Monument Creek. Preble's habitat is truncated by a large dam/pipe combination at I-25. The creek is funneled through a long siphon pipe (about 0.8 km long) under I-25 and emerges on the west side of I-25 on USAFA property. These features are almost certainly a barrier to Preble's (except during major storms when animals could be swept downstream), and animals on the east side of the dam cannot disperse to Monument Creek. There is probably a moderate-sized Preble's population east of the dam, based on the considerable amount of potential habitat and the recorded densities from a CDOT study area (Ensight 2001).

6. Pine Creek 21.8 miles of stream habitat.

Pine Creek is another tributary of Monument Creek that has been substantially altered by development in recent years. A large energy-dissipation structure was constructed on the creek in 1996 at Academy Boulevard. Subsequent population monitoring on both sides of the structure for three years did not demonstrate any Preble's movements past the structure (Meaney). This structure splits Preble's on Pine Creek into two populations; animals on the east side of the structure are a small, isolated population; animals on the west side may be connected to the Monument Creek south population (this is somewhat in doubt because of the very incised stream channel west of the structure and the subsequent poor habitat conditions).

The three projects in this PBA relate to Preble's populations and habitat in the following ways:

- Most affected areas are on drainage pathways that flow under I-25 with the exception of the Shoup and Powers projects on upper Black Squirrel Creek;
- All project impact areas are on eastern tributaries of Monument Creek;
- Most (if not all) streams/drainages have Preble's meadow jumping mouse populations;
- Most (but not all) tributaries have habitat connections to Monument Creek;
- Most of the mouse populations on Monument Creek tributaries affected by project actions are likely to be small (fewer than 500 individuals), with the possible exception of Black Squirrel and Kettle Creeks.

These data and concepts lead to a series of related issues that the Panel condensed into a single question: how do we manage small mouse populations for long-term persistence? The issue of connectivity among populations emerged as the major biological focus in the resulting panel discussion.

Connectivity

Linking or connecting habitat areas is of tremendous value, for both genetic diversity and population demographics. Maintenance of genetic connectivity does not mean constant movement. For example, a single reproductive individual dispersing from one population to another each generation can maintain the population and reduce inbreeding potential.

Connected populations are larger and have greater rates of genetic exchange. Connected populations can better survive catastrophic events; if a small part of the population survives the event, survivors remain to recolonize vacant habitat. These factors lead to greater population persistence. The opposite of connectivity, isolation, implies a greater probability of extinction.

Some potential barriers, such as the highway itself, may provide absolute barriers to movement. Other obstacles may function more like a filter, impeding but still allowing dispersal. Filters such as culverts may avoid adverse effects for both genetic considerations and population dynamics if they allow for passage of one or more individuals per generation between populations. However, areas with small populations eliminated by random events may not be able to recolonize through filters.

Connectivity is related to habitat features in the landscape and the life history traits of the animal in question. The size, shape, and configuration of habitat patches affect the use of and movement between them by the animal. The behavior of the animal (territorial/non-territorial), its ability to move, feeding/breeding requirements, and perception of landscape features affect how it will use and move through habitat.

Preble's have features that suggest it is a good colonizer. It is adapted to an early successional stage of vegetation (willows), not strongly territorial (suggestive evidence), omnivorous in its diet allowing for more flexibility in selection of food sources, and an excellent long distance traveler (as evidenced by known travel distances of 1.6 km, or 1 mile). These qualities are described as characteristic of a good colonizer (Wolff 1999) and suggest that these animals can take advantage of potential connections between patches of habitat.

Connectivity for the Preble's mouse is closely related to hydrologic pathways because mouse movement is always correlated with riparian corridors. This has been well documented by movement studies with radio-collared animals (Tanya Shenk, CDOW; Tom Ryon, Greystone; Rob Schorr, CNHP, personal communications). These studies show that 90 percent of movements are within 91 meters (298 feet) of a stream (Shenk, 2000). However, jumping mice have occasionally been captured in upland habitats that are at considerable distances from drainage pathways. These movements appear to be rare, but are potentially significant if a dispersing animal reaches a new population.

Preble's habitat within a drainage may have occupied riparian patches with thick cover interspersed with more open patches. These open patches may be used for dispersal routes between the occupied patches. This pattern of variable occupation within the same drainage is best known from Dirty Woman Creek. Dirty Woman Creek has been trapped for five consecutive years (1998-2002). Permanently marked mice have provided patterns of movement and habitat use (Ensight 1999, 2000). Most of the potential habitat on the drainage has been trapped, and jumping mice are found in all trapped areas downstream of the State Highway 105 crossing. Some habitat patches have very low mouse densities, and on occasion jumping mice are not captured. But movement patterns from individual animals show that jumping mice can move through the entire drainage corridor, including these lower quality habitat patches.

Barriers prevent all animal movement and would fragment populations. Information from several studies show that jumping mice are surprisingly vagile when confronted with unfavorable habitat conditions. Jumping mouse movement has been documented through a 93 meter-long (305 feet) concrete box culvert under I-25 on Dirty Woman

Creek, with adult, juvenile, male and female animals making it through the culvert (Ensight 1999). On the same drainage, Preble's have moved past secondary roads where the stream moves through corrugated metal pipes, as well as through a town park that has remnant riparian vegetation that averages 15 meters (49 feet) in width. It is not known whether such movement across secondary roads occurs over the roads or through the culverts, but successful movement across I-25 is almost certainly via the culvert.

V. GENERAL PROJECT BIOLOGICAL IMPACTS

All three projects will result in alteration of Preble's habitat, and potential take of individual animals during construction.

Effects to habitat will be primarily due to reduction in habitat areas. Fragmentation usually refers to a reduction in habitat areas as well as a reduction in animal mobility between habitat patches. Preble's mobility will be affected to some extent by lengthening of culverts under I-25 and SH 83. However, it is not anticipated that culvert lengths will exceed 300 feet, which is close to the maximum known culvert dispersal distance (305 feet at Dirty Woman Creek).

In some cases, mobility under I-25 will be improved (at Jackson Creek) because of habitat improvements. Also, small mammal ledges may be used in new culverts to enhance mouse mobility pending research results. Therefore, Preble's dispersal will not be affected to the point where movement under road surfaces is impossible, with subsequent isolation of populations. All project areas will allow for dispersal rates that should support both genetic mixing and maintenance of current population sizes. We anticipate that post-project dispersal rates will be very similar to pre-project dispersal rates, or in some cases, increased.

Project impacts will cause a loss of habitat area. There will be a permanent loss of 25.7 acres from the three projects, and 36.16 acres of temporary loss. Some of these areas include breeding, feeding, nesting, and potential hibernation habitat. The majority of habitat impact (86 percent) will occur adjacent to existing roads, in areas that would not be considered high quality habitat. The new Powers Road project, with 8.61 acres of disturbance, will include disturbances to poor quality riparian habitat, within a severely downcut stream channel.

Preble's behavior will also be affected during project construction. Disturbances to habitat may affect breeding behavior, dispersal ability, and susceptibility to predation. Such effects are difficult to quantify, but are considered in this PBA by using steps to avoid and minimize project effects.

Cumulative Effects

Cumulative effects are effects that may have adverse impacts on Preble's [take]. Such effects may occur incrementally, or are removed in time or place from a source action. .They include effects from future non-federal actions in the programmatic area not directly or indirectly associated with the FHWA/CDOT projects. Effects may occur from past, present and reasonably foreseeable future actions. Such effects may go undetected or seem inconsequential when they first occur, but may have environmental consequences at later dates.

There are several potential cumulative effects that may have consequences for Preble's in northern El Paso County. Most of these potential effects are not the direct or indirect results of FHWA/CDOT projects. However, all reasonable potential cumulative effects of future non-federal actions thought to be reasonably certain to occur in the programmatic area have been identified here in an effort to provide information that will guide conservation strategies to address these potential problems.

FHWA/CDOT are currently conducting a regional cumulative effects analysis (RCEA, Wilson, 2003) for four project areas in El Paso County, including I-25. The project area for the RCEA includes all of the project areas covered in this PBA. This analysis will identify potential cumulative effects and suggest specific conservation strategies. Some of the conservation strategies that have been proposed in the draft RCEA, such as maintenance or creation of wildlife corridors, have already been adopted in the conservation strategy of this PBA It is expected that FHWA/CDOT will adopt additional strategies that will also provide benefits to Preble's.

One of the major threats to Preble's identified in the USFWS listing package (USFWS 1997) was loss of habitat. This threat will not diminish in El Paso County in the near future; the population in the El Paso County is expected to increase from about 517,000 in 2000 to nearly 746,000 in 2025. It is very likely that Preble's upland and riparian habitat will be affected by increases in residential and commercial development during this period.

Although the primary threat is the direct loss of habitat area, there are other potential cumulative effects that may adversely affect the structure and function of habitat areas. Potential cumulative effects include:

- Increases in stream flows due to increases in impervious surfaces in affected watershed. Residential and commercial building footprints, new roadways, and other compacted urban surfaces can contribute to increased runoff. Such increased flows can cause downcutting in stream channels, altering groundwater hydrology in the riparian zone, and negatively affecting riparian vegetation in Preble's habitat. There may also be increases in stream erosion with subsequent effects on water quality.

- Increases in urban predatory animals that may feed on Preble's. Such animals may include skunks, raccoons, house cats, coyotes, and foxes.

- Increases in exotic species, both animal and plant. The house mouse (*Mus musculus*) and Norway rat (*Rattus norvegicus*) are often associated with urban and rural residences and may compete with and prey upon Preble's in upland and riparian habitats. Bullfrogs inhabit slower moving waters and are known predators of Preble's. Construction practices may introduce or help spread weed species such as diffuse knapweed (*Centaurea diffusa*), Canada thistle (*Cirsium arvense*), and cheat grass (*Bromus tectorum*), among others.

- New trails and increased trail use in riparian and upland habitat areas to accommodate an increase in recreational demand.

Increased runoff and alteration of riparian areas is projected to be the cumulative impact that may have the greatest deleterious effect on Preble's. Such effects may already be apparent at Pine Creek, where stream downcutting and construction of an energy dissipating structure have affected Preble's habitat.

At this time, there are no specific estimates of the runoff caused by additional roadway surfaces within the three project areas. However, there are protective mechanisms in place that can reduce these effects. Colorado Springs and El Paso County have policy and criteria for drainage systems (City of Colorado Springs et al., 1987). Some of the relevant policies include:

- Drainage plans must be in conformance with a land use plan;
- Inter-basin water transfers are discouraged;
- If discharge into natural channels causes increases in flow and erosion, these actions must be mitigated;
- Channel realignments are generally not allowed; and
- Developers must have erosion-control plans.

All drainage planning associated with these projects will be in conformance with these drainage criteria. The increase in road surfaces will cause slight increases in streamflow. These increases may be detectable at stream locations near the roadway, but not at other downgradient locations, as the flows are attenuated along the stream channel. Peak discharges for the streams are expected to remain similar to existing peak discharges, with minor increases in low flows caused by development throughout the basins.

Increases in impervious surfaces will also result in new detention features, some of which may be located within Preble's habitat. Detention ponds are often steep-sided with limited riparian vegetation development. CDOT will be exploring new design options with these detention features in an effort to make them more compatible with known Preble's habitat features. It is possible that new detention features may not only enhance current habitat conditions, but may also provide linkages between adjacent upland areas. One such possibility exists within the I-25 median south of the Northgate interchange,

and design options will be reviewed with the U.S. Air Force Academy and the USFWS. CDOT will share detention design innovations with developers, county staff, and other interested parties.

Erosion from construction sites can become a problem. Site erosion is generally controlled by use of silt fencing, limited equipment access to sensitive areas (riparian zones), and rapid revegetation of disturbed areas. Some of these steps are further outlined in Appendix C, Best Management Practices.

An increase in residential housing will often have an effect on opportunistic urban animals, which may subsequently feed on Preble's. Many of these animals (fox, raccoon, skunk) are known to use the same stream culverts and bridge underpasses that are used by Preble's to cross under roads. Such underpasses cannot be developed for exclusive use by Preble's, nor would this be a desirable condition. CDOT's impending research project on culvert use by Preble's will explore potential design modifications that may increase Preble's mobility through culverts but also mitigate effects from these predators. Cover boxes with 3-inch drainage pipe were used in a Preble's movement experiment at the I-25 culvert at Monument; the boxes and pipe provided cover and protection from predators for Preble's as they moved through the culvert (Ensight 1999).

Invasive weed species can infest construction sites and spread to nearby areas. CDOT will control all state-listed weed species that are within their properties in accordance with state laws and guidance from USFWS in mouse habitat areas.

New and existing trails may affect Preble's habitat. There is currently one trail within the I-25 project area (the La Foret Trail at Black Squirrel Creek North), and another trail is planned at Shoup Road. CDOT has also been questioned by the county about routing a regional trail connection through the existing 65-acre Jackson Creek conservation area. CDOT has discouraged the county from locating the trail in the conservation area (an avoidance measure), and an alternate route is likely. CDOT will continue to work with county staff and developers on trail development, focusing on avoiding and minimizing such impacts where possible.

Additional conservation strategies may emerge at the conclusion of the RCEA study, and all applicable strategies will be adopted for these projects.

Effects on Critical Habitat

FHWA and CDOT have also made a determination on how this project will affect proposed critical habitat. Critical habitat includes specific areas, both occupied and unoccupied, that are essential to the conservation of a listed species and that may require special management considerations or protection. USFWS issued a draft rule on July 17, 2002, proposing critical habitat for the Preble's meadow jumping mouse in selected areas in Colorado and Wyoming (USFWS 2002).

Critical habitat has been proposed on the following areas within the scope of the PBA:

- Teachout Creek;
- Jackson Creek;
- Black Forest Tributary;
- Smith Creek;
- Monument Branch; and
- Black Squirrel Creek.

There are also several other drainages in the Monument Creek watershed that have been proposed as critical habitat in Unit A1 (Monument Creek), including areas on Monument, Dirty Woman, Beaver, and Kettle Creeks.

FHWA/CDOT have proposed actions that will both adversely affect and enhance or create Preble's habitat in critical habitat areas. Proposed projects would permanently affect 25.6 acres of proposed critical habitat and temporarily affect 32.5 acres.

Potential habitat restoration/creation would likely improve a minimum of 5 acres of habitat, and possibly more (primarily dependent on discussion with USAFA staff on conservation measures on Academy property in the I-25 median near Northgate). Another private parcel on Monument Creek is being considered for restoration, with approximately 70 acres of grazed riparian area being converted to riparian shrubland.

The project will affect critical habitat constituent elements, which are defined as follows:

1. A pattern of dense riparian vegetation consisting of grasses, forbs, and shrubs in areas along rivers and streams that provide open water through the Preble's active season;
2. Adjacent floodplains and vegetated uplands with limited human disturbance (including hayed fields, grazed pasture, other agricultural lands that are not plowed or disced regularly, areas that have been restored after past aggregate extraction, areas supporting recreational trails, and urban/wildland interfaces);
3. Areas that provide connectivity between and within populations. These may include river and stream reaches with minimal vegetative cover, or that are armored for erosion control, travel ways beneath bridges, through culverts, along canals and ditches, and other areas that have experienced substantial human alteration or disturbance; and

4. Dynamic geomorphological and hydrological processes typical of systems within the range of the Preble's, *i.e.*, those processes that create and maintain river and stream channels, floodplains, and floodplain benches, and promote patterns of vegetation favorable to the Preble's.

Project impacts will reduce riparian and upland vegetation cover, but more than half of the total affected area will be restored to pre-project vegetation conditions. Many of the proposed impact areas are not considered high-value habitat, especially upland grassland areas that are adjacent to mowed highway shoulders.

Population connectivity within the floodplain of each project area was carefully considered and prioritized in the planning process. In some project areas, culverts will be lengthened, potentially affecting animal mobility. However, potential adverse effects will be minimized by managing vegetation at culvert entrances, use of skylights where possible, and potential additional off-setting measures (pending results of a research project). In addition, the proposed off-site conservation measures focus on restoring the Preble's habitat linkages that will be necessary for Preble's recovery in this critical habitat unit.

The project will not significantly affect geomorphological or hydrological processes (streamflows will be maintained within historic conditions). Many of these constituent element functions will be supplied during the construction and revegetation phases by undisturbed adjacent areas of habitat. Although there will be impacts to these constituent elements, project actions will occur in a very small proportion of proposed critical habitat within the Monument Creek watershed (estimated < 1%), and will not appreciably diminish or preclude the role of proposed critical habitat within the basin to both the survival and recovery of the species.

Project beneficial actions will include the restoration of habitat linkages enabling the recovery of the mouse in this critical habitat unit. Project impacts within the PBA and the many beneficial conservation measures that are proposed do not meet the criteria for destruction or adverse modification of critical habitat.

VI. CONSERVATION MEASURES

Throughout the current phase of project development, FHWA and CDOT have avoided and minimized impacts to Preble's habitat and populations for all three projects. The anticipated impact levels will not be exceeded. CDOT and FHWA will continue to find ways to avoid or minimize impacts to Preble's during the remainder of project development and construction.

Despite efforts to avoid and minimize disturbances to habitat, some habitat impacts were unavoidable. These impacts will be off-set by various conservation measures that are provided in this section.

Avoidance

I-25

The reconstruction and expansion of I-25 has been planned for several years. I-25 intersects several drainages that are occupied by Preble's, and moving the project to non-habitat areas was not feasible. However, by confining reconstruction and improvements to the existing corridor, impacts to new habitat areas were generally avoided.

Highway widening was conducted to the inside (median area) when possible to avoid impacts to habitat on road edges.

Raising bridge structures on a few of the drainages (e.g., Black Squirrel Creek South) was evaluated to see if additional clearance could be obtained to better ensure revegetation success. Unfortunately, the existing highway grades determine bridge and culvert elevations and they could not be feasibly changed.

In some cases, moving the highway alignment to non-habitat areas was considered. In particular, shifting the I-25 alignment to non-habitat (to the west) in the vicinity of Pine Creek was examined. However, this would have resulted in an unsatisfactory safety condition due to curvature that would reduce design speeds for this high capacity roadway.

North Powers Boulevard

Powers Boulevard is a new roadway that will cross Black Squirrel Creek. Black Squirrel Creek is aligned east-west, and Powers is north-south, so it was impossible to avoid a crossing at some location. However, there was some flexibility in locating the required bridges, and this crossing was chosen in an area that had degraded riparian habitat.

Shoup Road

The Shoup Road/SH 83 intersection will be rebuilt because of safety concerns. This will also affect Preble's habitat on Black Squirrel Creek and project impacts could not be totally avoided because of the existing alignment. This area was live-trapped in 1999, and Preble's were found in high densities on the east side of SH 83, but not in the degraded riparian area on the west side (Ensight, 1999). Project design engineers shifted as much of the impact area as possible to the west side of the road in the poor habitat area, in order to avoid the better habitat on the east side.

Impact Minimization

When impacts to Preble's habitat were unavoidable, various techniques were used to reduce and minimize impacts to the fullest extent possible. FHWA/CDOT held two workshops attended by design engineers, environmental staff, and the project biologist. These workshops were useful in identifying habitat areas and associated impacts, and general techniques for minimizing impacts. Some of these general techniques are listed below. A more comprehensive list of best management practices (BMPs) is found in Appendix C.

Although every effort was made to minimize impacts, full minimization cannot be realized at this early stage of design (design is currently at about 30%). CDOT environmental staff will continue to work with design engineers through the final design phase, where additional impact reduction is likely. Design engineers and construction staff will also be briefed thoroughly on the need for further reductions and the use of BMPs.

USFWS asked FHWA/CDOT to review the feasibility of a maximum area disturbance (at any one time) concept. This concept does have applicability in some areas of the corridor, but will not work as a general procedure because of the flexibility that is needed for construction schedules. There is one general area within the I-25 corridor where failure to minimize impacts, either in a temporal or spatial sense, could have significant effects on local Preble's populations. The I-25 area south of the Northgate interchange has several Preble's inhabited streams that are in close proximity to one another. They are Smith Creek, Monument Branch, and North and South Black Squirrel Creeks. Preble's may move into the I-25 median from all of these streams and may even move from stream to stream via habitat connections. There are no other streams within the corridor that are in such close proximity where impacts would raise this concern.

FHWA/CDOT believe that impacts in this sensitive area can be minimized by the following conditions:

- A minimum of one of these streams (Smith Creek, Monument Branch, and North and South Black Squirrel Creeks) will remain as a movement corridor for the mouse. The movement corridor will either be undisturbed or will be a disturbed areas that is fully restored, or has been restored to the extent that animal mobility will not be affected. In the latter case, artificial cover and other means may be necessary to provide adequate cover for movement.
- No more than 50% of the projected impact area here will be disturbed at any one time.

Each construction project will have an erosion control plan with permanent and temporary measures (BMPs) that will minimize adverse effects to water quality.

If FHWA/CDOT are unable to meet these conditions due to scheduling, budgeting, logistical, or other conflicts, the agencies will reconsult on this matter.

General Minimization Techniques

- Scheduling highway construction during the hibernation season (November 1 to April 30) to minimize impacts to Preble's during the active season, and preventing disruption to breeding, feeding, and dispersal activities;
- Native vegetation will be used in all revegetation efforts, and the site will be promptly revegetated. Noxious weeds will be controlled as necessary;
- Construction of minor drainage culverts and other roadway appurtenances will be done from the roadway itself where practical to limit disturbance;
- In some cases, rip-rap will be needed for channel protection. Rip-rap will be covered with earth and revegetated where possible (Pine Creek, Black Squirrel Creek South);
- Maximum slope grades will be used to reduce habitat impact areas on toe slopes, including the use of guard rail when appropriate;
- In most cases where work on concrete box culverts will be necessary because of lane additions, existing culverts will be lengthened rather than replaced, considerably reducing impact areas;
- Wing walls will be used on bridges and culverts as appropriate to further reduce impacts to toe slopes;
- In a few cases culverts under I-25 may have lighting shafts constructed to the surface if feasible to allow some daylight to enter the structure (Teachout Creek, possibly others);
- Erosion and sediment will be controlled by the use of silt fencing and sediment basins as appropriate;
- Disturbances within hibernation habitat will be mitigated by clearing such areas of shrubs and other woody vegetation by August 15 to discourage mice from hibernating in these areas prior to construction;
- Construction access will utilize existing pathways to the extent possible;

- Placement of bridge girders and related work will take place from existing roadway pavement (from above) to the extent possible;
- Mowing along the new highway will be limited to one mower width in most cases, and the remainder of the toe slopes will be left unmowed. Mowing will be consistent with a Memorandum of Understanding between CDOT and USFWS. Signing will be provided to delineate mowing limits for CDOT maintenance personnel.

Additional Conservation Measures

Conservation measures will be needed to off set impacts to Preble's habitat and populations that could not be avoided or prevented through minimization. CDOT has anticipated mitigation needs for several years, and has organized a series of conservation measures to fulfill this obligation. There are four aspects to this program: research, monitoring, on-site habitat actions(in or near impact areas), and off-site habitat actions. All conservation measures have been guided by a general conservation strategy and associated goals.

Conservation Goals and Strategies

FHWA/CDOT recognize that conservation measures that support the recovery of Preble's within the Monument Creek watershed will provide the greatest biological benefits to the mouse and ultimately be the most cost-effective over the long term. This can be accomplished by helping to ensure the existence of a large population of Preble's in northern El Paso County. FHWA/CDOT have determined more specific objectives that will guide a comprehensive conservation program.

Recovery can occur when habitat protection and other measures have been put in place that will guarantee the survival of the mouse. Criteria for delisting the Preble's have been outlined in a draft Preble's Recovery Plan (USFWS 2001), and FHWA/CDOT have used that plan to guide conservation measures for this PBA. In that plan, the first criterion that must be met for delisting in the Arkansas Basin is the existence of one large, self-sustaining wild population, consisting of greater than 2500 animals on at least 50 miles of stream habitat, along Monument Creek and connected tributaries. Other recovery criteria include protecting and managing Preble's habitat, threat abatement, and long-term management plans and cooperative agreements.

The strategy of facilitating recovery of the Preble's in the Monument Creek drainage has been used as an umbrella to guide project goals, conservation measures and coordination with other agencies.

Conservation Program and History

This work is part of an ongoing process that has been underway in El Paso County for several years. During this period CDOT has organized and held two workshops attended by design engineers, environmental staff, and the project biologist to help identify potential impacts and develop approaches for their minimization. CDOT consultants have been trapping for Preble's mice in several areas within the Monument Creek basin. CDOT organized a panel of Preble's experts to identify the pertinent biological issues that would result from its projects. This group met during three all-day sessions in 2000 to help establish a conservation strategy for the Preble's mouse in the Monument drainage. CDOT has been working to establish a protected corridor along Dirty Woman and Jackson Creeks with appropriate restoration. The Colorado Natural Heritage Program prepared for CDOT an analysis of Preble's habitat and populations in the Monument Creek drainage to further develop a conservation strategy. CDOT has been attending meetings of the El Paso group working on development of a habitat conservation plan for the county. Out of this wide array of efforts CDOT has formulated a preliminary plan that includes actions believed to be essential for the long-term existence of a Preble's population of at least 2,500 adult mice occupying at least a 50-mile connected network of habitat along perennial streams in the Monument Creek basin.

FHWA/CDOT will work toward the recovery goal and conservation objectives through a four-point program including on-site habitat actions, off-site habitat actions, monitoring and research. These four elements are described below.

A. On-Site Habitat Actions

On-site actions include all steps that will be taken to avoid and minimize impacts, as well as to enhance, restore, and create habitat within or near project areas. As stated in the conservation strategy/goals section, actions to restore, create, or enhance habitat linkages will be given the highest priority. At this time, a minimum of 3.8 acres of habitat will be created, enhanced, or restored at the Pine Creek, Baptist Road, and SH 83 locations.

B. Off-Site Habitat Actions

Off-site actions are conservation measures that will be taken to restore, create, or enhance habitat linkages, as well as the purchase of properties that are needed to create habitat corridors.

1. Create, restore, or enhance habitat linkages. Habitat fragmentation is probably the greatest threat to Preble's populations in El Paso County. FHWA/CDOT have identified several isolated populations, and one or more habitat linkages will need to be restored for recovery to occur. Linkages can provide measurable biological benefits in at least two ways:

- Linkages generally have poor habitat conditions that not only restrict or prevent Preble's movement, but also preclude animal residency. Restoration or enhancement of linkages can not only lead to improved (or restored) mouse

mobility, but may also provide the critical habitat elements that will allow establishment of a resident population, if the linkage is large enough. The length and condition of the linkage will determine the eventual benefits of restoration or enhancement actions.

- Restored linkages reconnect isolated populations. This is the primary benefit that will be needed to achieve the recovery goal.

2. Protect, enhance, or restore habitat corridors. Conservation at the small watershed scale will help to ensure desirable population size, genetic diversity, and protection against catastrophic events and future fragmentation.

FHWA/CDOT have made considerable progress toward constructing habitat corridors on two streams in northern El Paso County. Efforts have been focused on Dirty Woman and Jackson Creeks in northern El Paso County (including the area of the confluence of Dirty Woman and Monument Creeks). Both of these streams are occupied by Preble's and represent the most important Monument Creek tributary populations north of the Air Force Academy.

Dirty Woman Creek is the location of the I-25/SH 105 Monument interchange that is now undergoing reconstruction (construction began in fall 2002, see Ensight 2000 and 2002). CDOT began a program of property and conservation easement purchase in 2000, and much of the known Preble's habitat on this stream is now in permanent protection through CDOT efforts. Conservation easements to date have been used to off-set project impacts at the Monument interchange project (DeFelice, Shingledecker, and Lovato easements). CDOT also owns the area between S.H. 105 and I-25, and the area west of I-25 for approximately 0.3 miles. CDOT will continue to pursue the remaining parcels that are needed to complete this corridor, and is committed to habitat protection, enhancement, and restoration, as needed.

CDOT has also purchased a 65-acre conservation property on Jackson Creek east of I-25, to fulfill conservation needs for the Monument interchange and Powers Boulevard projects. This property was scheduled for development before CDOT intervened and purchased it in 2001. Several habitat improvements will occur at this property in the coming years, including conversion of dense cattail stands to shrub islands (slated for winter 2002-03), the removal of a frontage road and a long culvert, and improvements to the I-25 culvert structure. CDOT is actively negotiating for additional habitat purchases on the west side of I-25 that will complete this important habitat corridor.

3. Coordinate conservation actions and information with other agencies and landowners. Recovery can only be achieved through coordinated efforts. FHWA/CDOT conservation efforts have provided important information that will be needed for recovery. CDOT is working closely with El Paso County and the U.S. Air Force Academy, and these agencies will likely conduct actions that will contribute towards recovery. The cooperation of developers and private landowners will also be essential for success, and

CDOT will share conservation information and cooperate with other such interested parties.

C. Monitoring

FHWA and CDOT recognize the importance of a monitoring program for both habitat restoration and Preble's population responses. The monitoring program will have two major elements: effectiveness monitoring for success standards, and monitoring for special project information.

Effectiveness monitoring determines if the anticipated impacts stated in the PBA and permitted in the BO are occurring, and if progress is being made toward the biological goals and objectives of this PBA. This will generally include a determination of disturbed area (tracked in a project database), and an accounting of revegetation activities. Revegetation monitoring includes management of the revegetation contract, selecting appropriate plant materials, ensuring proper planting techniques, and implementing appropriate BMPs. Revegetation areas are then surveyed following planting until the success standards stated in the BO are met. We anticipate success standards similar to standards in previous biological opinions (e.g., 70% foliar cover). These monitoring actions will be reported to USFWS in an annual report.

USFWS often recommends that Preble's population monitoring be conducted for three years following project construction. FHWA/CDOT suggest that this should not be a requirement for all project areas. Population monitoring that has been conducted at other project sites (Castle Rock, CDOT Region 1), or is in progress (at the Monument interchange), is providing this level of information. We suggest that monitoring at sites where habitat linkages will be created or improved is a better use of resources. Although the general value of habitat linkages for the persistence of small populations is recognized, there is relatively little specific scientific information on linkage value to small mammals. Collecting these data would serve to gauge the success of the planned linkages, and provide valuable information for the Preble's Recovery Team. CDOT/FHWA will work with USFWS to develop success standards appropriate for linkages.

D. Research

CDOT will fund a research project on Preble's use of culverts with small mammal ledges. This work is guided by similar work that was conducted in Montana, where small mammal ledges were shown to enhance movement though culverts (Foresman, 2001). This work would have wide applicability in all areas of the Preble's range.

Conservation Commitments

1. Avoid and minimize impacts to Preble's habitat to fullest extent practicable.

2. Not to exceed 36.2 acres of temporary alterations and 25.7 acres of permanent alterations to Preble's habitat.

3. Successful restoration of all temporarily altered habitat or replacement with equivalent quality or better habitat.
4. Reestablishment of at least two linkages. The following options are known at this time:

Linkage	**Stream miles for each segment**	**Population Status of proposed linkages**
Lower Monument to Upper Monument	211.3 miles to 63.5 miles	Large population to large
Kettle Creek to South Monument Creek	67 miles to 211.3 miles	Medium population to large
Hay and Beaver to South Monument	33.8 miles to 211.3 miles	Small population to large
Jackson Creek to Monument Creek South (severe filter)	9.6 miles to 63.5 miles	Small population to large
Teachout to Monument North	5.23 miles to 63.5	Small population to large

More detail respecting each of these options is provided in Appendix D. CDOT/FHWA will continue to explore these options to determine likely benefits, actions necessary for successful reestablishment of each Preble's linkage, and landowner willingness.

If expected outcomes are not achieved, corrective measures will be taken and the success of these measures will be monitored.

5. Purchase of conservation easements or fee title on 50 additional acres of habitat in Dirty Woman, Monument, or Jackson Creeks. Other areas of Preble's habitat in northern El Paso County may also be considered. Habitat restoration, enhancement, or creation may be conducted on these lands as appropriate. This acreage will serve as advance mitigation for disturbances within the project areas.

6. Completion of research program on small mammal ledges and implementation per results of research.

7. Active cooperation with El Paso County and the U.S. Air Force Academy

8. Reporting:

    a. Development of an interactive database as outlined in DOT Programmatic Consultation Guidance with the following fields:
        - Incidental take statement duration for the PBO;
        - Amount of allowable take;
        - Location of permitted action and conservation areas;
        - Amount of area in action area;
        - Species and habitats in the biological opinion; and
        - Nature of allowable activities that conform with the incidental take statement.

    b. Annual reporting
        - Progress on reestablishing linkages;
        - On-site conservation actions including habitat acres disturbed; acres revegetated; acres restored;
        - Research progress and outcomes; and
        - Coordination actions and outcomes.

    c. Template biological assessments for site-specific projects
        - Project description;
        - Timing;
        - Habitat to be affected; and
        - Effects of project and how addressed.

VII. STRUCTURE OF THE PROGRAMMATIC PROCESS

The U.S Fish and Wildlife Service and the U.S. Department of Transportation have developed guidelines on structuring and implementing PBAs (U.S. DOT, 2000). These guidelines have been used to develop schedules, procedures for correspondence and project approval, and other process related elements.

Database

FHWA/CDOT will maintain a real-time database that will include project information for activities that are covered in the programmatic biological opinion (PBO). The database will include the following:

- Species and habitats in the PBO;
- Nature of allowable activities;
- Status of projects, progress made on projects and conservation measures;
- Incidental take statement duration and amount of allowable take;
- Project locations and tally of all project impacts (acres temporary, acres permanent categories), compare to amount in PBO;
- Restoration project locations and tally of all on-site project restoration efforts (acres successful, acres unsuccessful categories); and
- Tally all off-site project restoration efforts including success of linkages.

Reporting

FHWA/CDOT will deliver an annual report to USFWS that documents the status of all activities covered in the PBA/PBO. The USFWS will have 30 days to review the annual report, and a meeting between all the parties will follow that will serve as a discussion/planning forum to guide the next year's activities.

If an emergency occurs within project area habitat, CDOT will notify USFWS immediately and determine and implement solutions that will correct the situation and minimize any additional impacts to habitat areas. CDOT will submit a report to USFWS describing any actions taken, additional impacts (if any), and an updated project database report (if applicable).

Review and Document Submittal

A final PBA will be submitted to USFWS in February 2003, with a PBO expected in June 2003. The PBO serves as the framework for assuring that project activities it covers proceed in a manner fully compatible with the Endangered Species Act. In addition to a description of project activities, it includes an incidental take statement for all projected impacts identified in the PBA, assuming that proposed conservation measures off-set impacts.

Site-specific BAs (SSBA) will be submitted for all projects that are covered in the PBO. SSBAs will be organized in a flexible manner by FHWA/CDOT to conform with construction schedules, funding mechanisms, and other future circumstances (e.g., a site-specific BA may include multiple sites).

A site-specific BA will include a detailed project description, and final efforts to avoid and minimize project impacts will be documented. The timing of project will be described. The SSBA will document that the project and its effects on the Preble's mouse have been fully addressed in the PBO. Impacts from the SSBA will always be compared to the incidental take that was permitted in the PBO. A database report (see below) will also be included in the SSBA.

The USFWS will review the SSBA, and if it complies with the terms and conditions of the PBO, a letter amending the PBO will be issued within 30 days.

If the SSBA does not comply with the terms and conditions of the PBO, USFWS will notify FHWA/CDOT by letter within 30 days, and the agencies will re-consult on the project.

There may be situations where changes to the SSBA occur after the amended PBO has been issued. In the event that such changes are determined to potentially have adverse effects on the mouse beyond those identified and addressed in the PBO, or the take authorized in the PBO will be exceeded, CDOT Environmental Staff will notify the USFWS representative. If the USFWS representative determines that the additional adverse effects are negligible or have been adequately addressed under the PBO and the SSBA, the change will be approved. A letter from FHWA to USFWS documenting the situation and discussion will be approved by USFWS and appended to the project file.

If the authorized take will not be exceeded, or there were no additional measurable biological impacts from the change to Preble's, the changes will be reported in the annual report without any additional formal correspondence.

VIII. DETERMINATION OF EFFECTS

The I-25 project, Powers North, and Shoup Road projects will adversely affect 61.9 acres of Preble's habitat; 25.7 acres of disturbance will be permanent and 36.2 acres will be temporary. The majority (86 percent) of the total disturbance will be associated with improvements to existing roadway, through adding highway lanes, extending culverts, and rebuilding existing interchanges. There will be one new roadway: North Powers Boulevard over Black Squirrel Creek.

The Preble's habitat affected on I-25 is primarily on the outside of existing north/south highway lanes, and near bridges or culverts under I-25. Much of this habitat affected by widening includes the current highway toe-slopes, and is covered by upland grasslands, in moderate to poor condition. Riparian areas surrounding existing culverts or bridges will also be impacted, but this habitat is a small percentage of the total. There is also some unusual higher quality riparian/upland habitat within a wider portion of the I-25 median south of the Northgate interchange that will be adversely affected.

Habitat affected by Powers North and Shoup Road SH 83 includes poor quality riparian vegetation in an area with a very small Preble's population. Although good-quality upland habitat will be affected here, it probably receives little Preble's use because of the degraded nature of the riparian area.

All affected habitat is on first-or-second order streams that are tributaries of Monument Creek. Most affected areas probably have small Preble's populations (Pine Creek, Monument Branch, Smith Creek, Black Forest drainage, and Teachout Creek). Although Kettle Creek probably has a moderate population of jumping mice, the Kettle Creek habitat on east side of I-25 is separated from the highway by a large dam, and the west side has a degraded stream channel; impacts at this location will likely have little effect on mouse populations. The primary areas where highway impacts will affect larger mouse populations will be at Black Squirrel and Jackson Creeks.

With the exception of habitat at Pine and Kettle Creeks, all of the impact area has been proposed by FWS as critical habitat (subject to change in the June 2003 final rule).

Habitat impacts were avoided when possible. Widening was placed to the inside of the highway in non-habitat areas when possible, avoiding impacts to habitat on the outside of the roadway. The new Northgate interchange was placed in areas of non-habitat or existing residential build-up when possible. Much of the work will be scheduled during the mouse hibernation period, avoiding disruption to mouse movement and natural behaviors.

FHWA and CDOT took several steps to minimize impacts to habitat and mouse populations. Toe slopes were steepened to minimize disturbance to slope habitat areas or additional encroachment in adjacent habitat. In most cases, existing culverts were lengthened rather than replaced, and culverts will be fitted with small mammal ledges pending the outcome of a research study. Maximum culvert length was controlled by the

maximum known mouse dispersal distance through a culvert (300 feet) when possible. Best management practices and additional minimization steps will be taken during final design.

Minimization efforts during the development of concept design reduced project impacts, and further reductions during final project design and construction are expected. Several conservation measures were taken or are in process. Conservation measures were guided by recommendations from an expert panel that advocated two general principles:

- Provide the greatest on-site restoration and habitat enhancement possible at impact sites; and

- Conduct on and off-site mitigation projects that will promote Preble's recovery in the Monument Creek drainage of El Paso County, and provide protection to critical habitat.

Conservation measures focused on creating, restoring, or enhancing habitat linkages. Linkages were recommended as the most effective conservation action to achieve recovery in El Paso County.

In addition to these actions, CDOT has purchased various properties on Dirty Woman and Jackson Creeks in the Northern Monument basin. All of these properties will be permanently protected, and some properties on Dirty Woman and Jackson Creeks will have additional habitat enhancements. FHWA/CDOT have now assembled a series of linked properties in northern El Paso County that will provide long-term protection for the mouse.

Although the project will result in alteration and loss of habitat, the projects will not cause habitat fragmentation and loss of connectivity within and between populations in the project areas once restoration is complete. Habitat connectivity and mouse mobility will improve at project sites by improved culvert and bridge designs, and various actions that will bypass obstacles to movement. Most project actions will occur within habitat that supports low-density Preble's populations. Most project impact areas have small populations of Preble's. The nature of the impacts and subsequent restoration actions will allow populations in project areas to recover.

Collectively, on-and off-site actions will allow affected Preble's populations to recover to pre-disturbance levels and promote establishment and persistence of a large Preble's population in El Paso County.

IX. SUMMARY

FHWA and CDOT have three highway projects that will affect habitat and populations of the Preble's meadow jumping mouse in El Paso County, Colorado. Impacts to habitat were avoided and minimized where possible, but a total of 61.86 acres of Preble's habitat may be affected by project actions (25.7 acres of permanent impact, 36.16 acres of temporary impact). The majority of the impacts will be to habitat along existing roadways. Project descriptions, biological impacts, and conservation measures have been described in this document in a programmatic biological assessment (PBA) format.

Conservation measures that are offered in this PBA include on-site measures to restore disturbed habitat, off-site measures, and research and monitoring programs. The off-site measures focus on restoring habitat linkages and acquiring additional habitat areas within two existing corridors. Linkage restoration is targeted specifically toward attainment of goals stated in the draft Preble's Recovery Plan.

The three projects will adversely affect Preble's habitat and populations, but the proposed conservation measures will offset these impacts and improve the viability of Preble's populations in the Monument Creek watershed.

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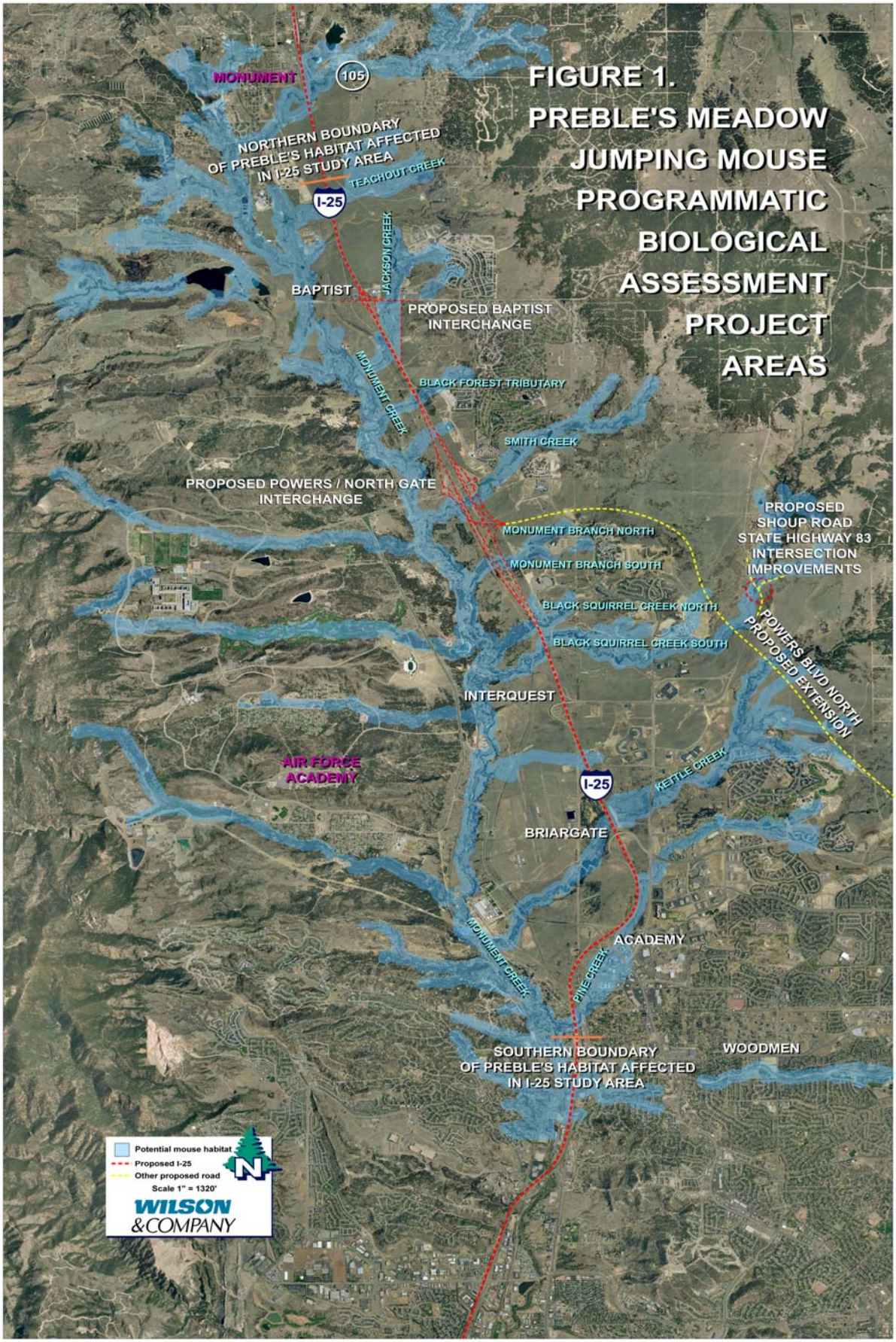
FIGURE 1.
PREBLE'S MEADOW JUMPING MOUSE PROGRAMMATIC BIOLOGICAL ASSESSMENT PROJECT AREAS
MONUMENT
105
NORTHERN BOUNDARY OF PREBLE'S HABITAT AFFECTED IN I-25 STUDY AREA
TEACHOUT CREEK
I-25
JACKSON CREEK
BAPTIST
PROPOSED BAPTIST INTERCHANGE
MONUMENT CREEK
BLACK FOREST TRIBUTARY
SMITH CREEK
PROPOSED POWERS / NORTH GATE INTERCHANGE
MONUMENT BRANCH NORTH
MONUMENT BRANCH SOUTH
BLACK SQUIRREL CREEK NORTH
BLACK SQUIRREL CREEK SOUTH
PROPOSED SHOUP ROAD STATE HIGHWAY 83 INTERSECTION IMPROVEMENTS
POWERS BLVD NORTH PROPOSED EXTENSION
INTERQUEST
AIR FORCE ACADEMY
I-25
KETTLE CREEK
BRIARGATE
MONUMENT CREEK
ACADEMY
PINE CREEK
SOUTHERN BOUNDARY OF PREBLE'S HABITAT AFFECTED IN I-25 STUDY AREA
WOODMEN
Potential mouse habitat
Proposed I-25
Other proposed road
Scale 1" = 1320'
WILSON &COMPANY

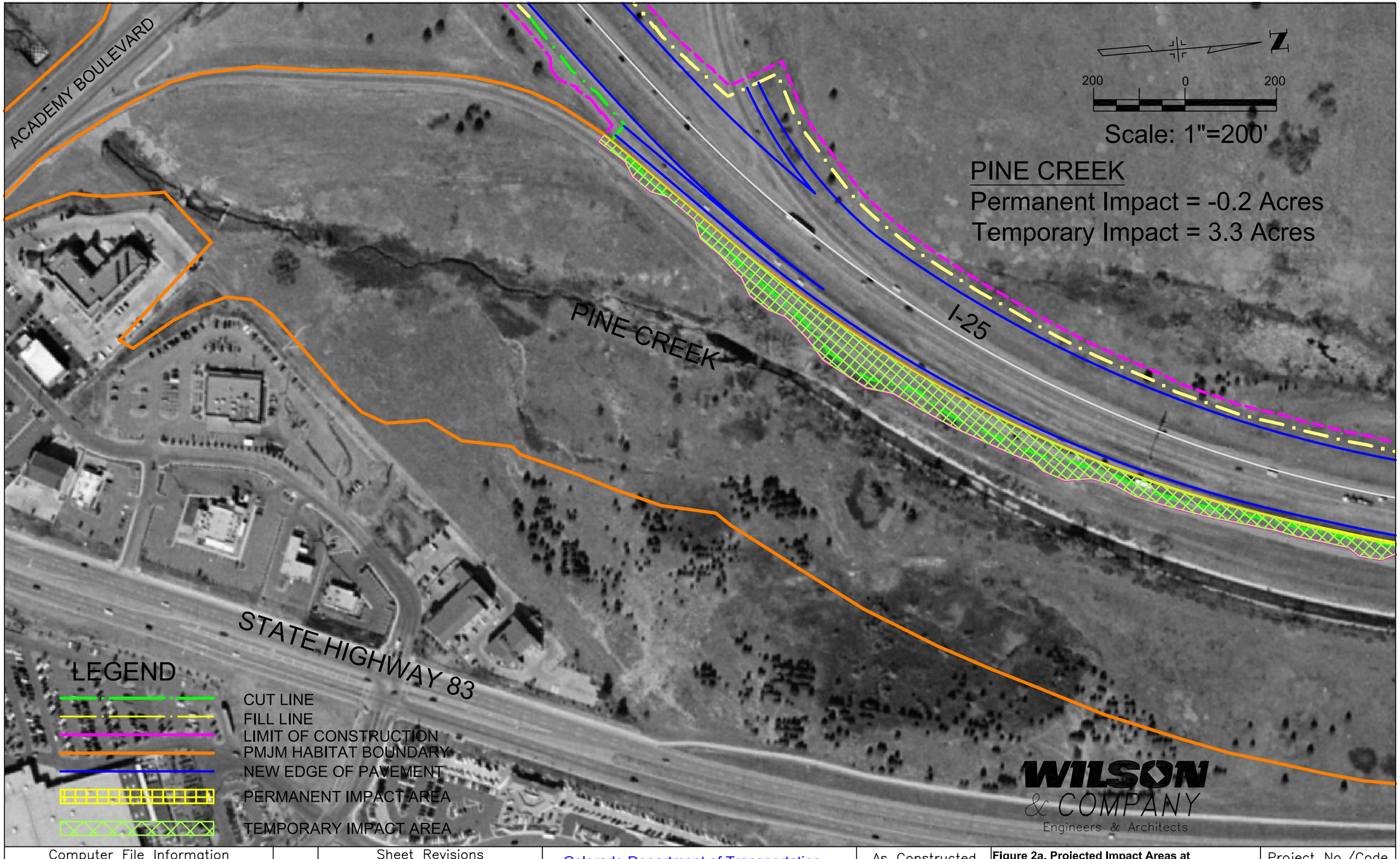

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Figure 2a. Projected Impact Areas at Pine Creek, South Section, I-25 Project, El Paso County, Colorado

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Detailer:		
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C 0252-316
12210
Figure 2

PINE CREEK

Permanent Impact = -0.2 Acres

Temporary Impact = 3.3 Acres

200 0 200

Scale: 1"=200'

I-25

PINE CREEK

STATE HIGHWAY 83

LEGEND

- CUT LINE
- FILL LINE
- LIMIT OF CONSTRUCTION
- PMJM HABITAT BOUNDARY
- NEW EDGE OF PAVEMENT
- PERMANENT IMPACT AREA
- TEMPORARY IMPACT AREA

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Figure 2b. Projected Impact Areas at Pine Creek, North Section, I-25 Project, El Paso County, Colorado

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Detailer:

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Figrue 2b

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Figure 3. Projected Impact Areas at Kettle Creek, I-25 Project, El Paso County, Colorado

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Detailer:
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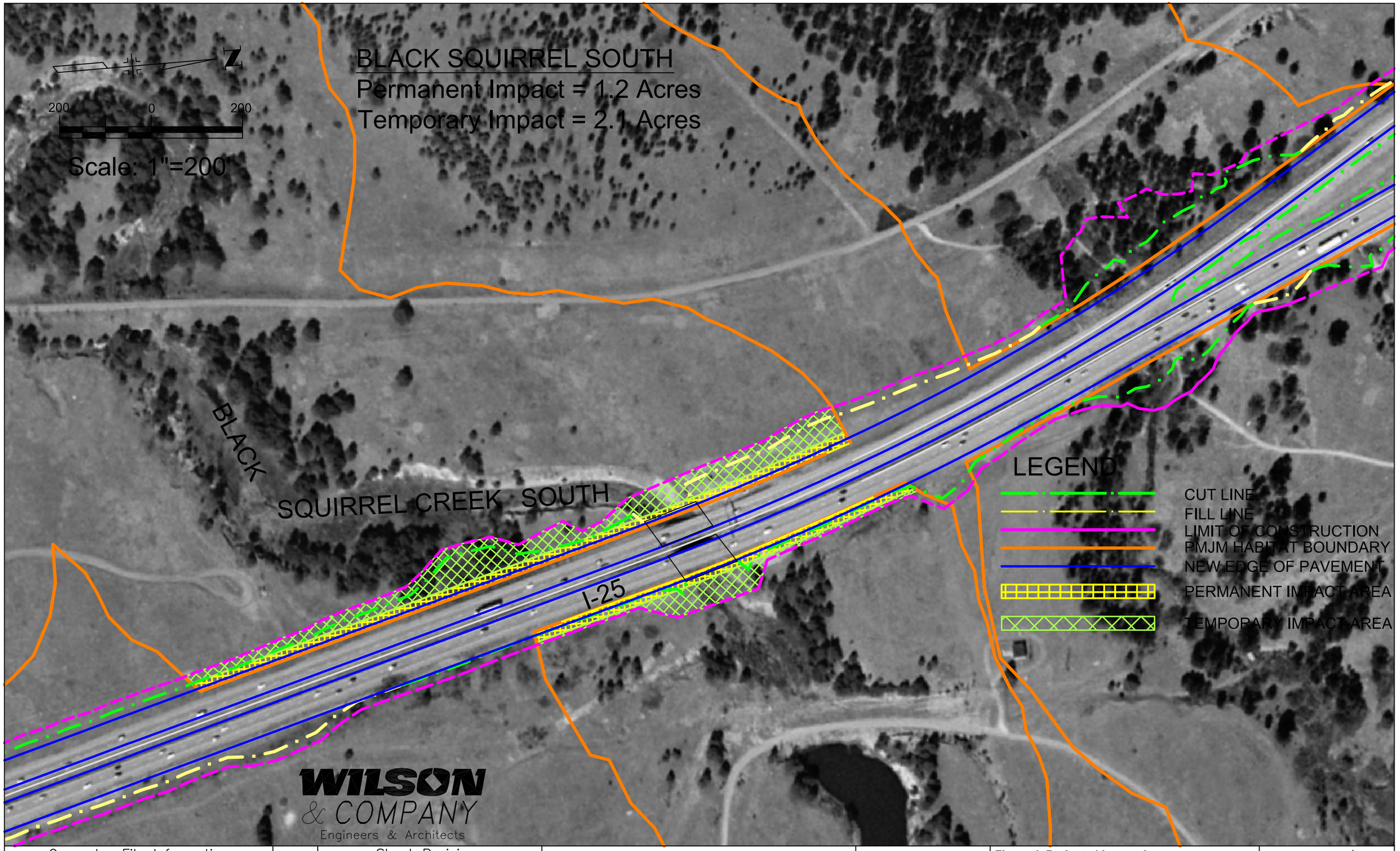
Figure 3



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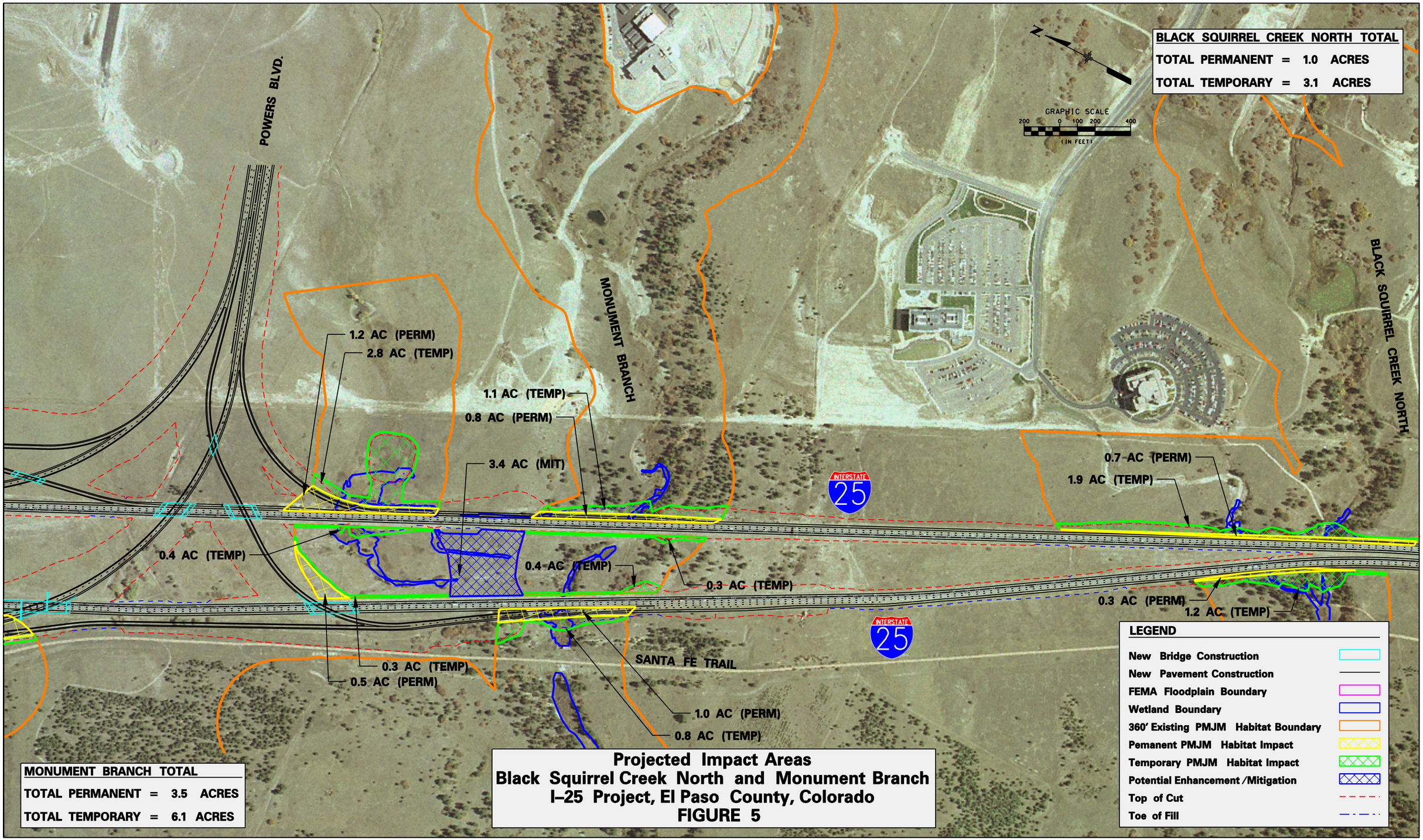


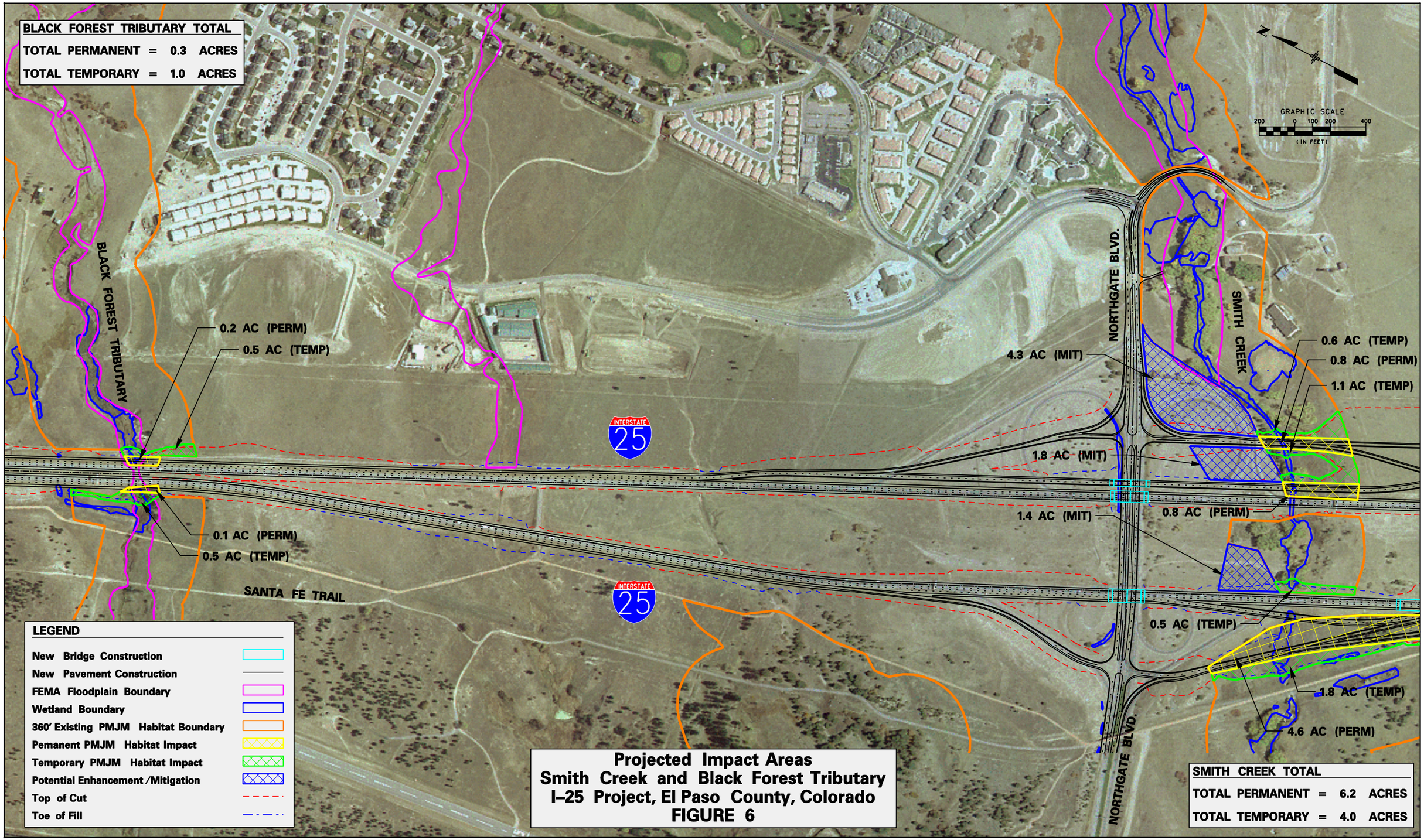
BLACK SQUIRREL CREEK NORTH TOTAL			
TOTAL PERMANENT	=	1.0	ACRES
TOTAL TEMPORARY	=	3.1	ACRES

MONUMENT BRANCH TOTAL			
TOTAL PERMANENT	=	3.5	ACRES
TOTAL TEMPORARY	=	6.1	ACRES

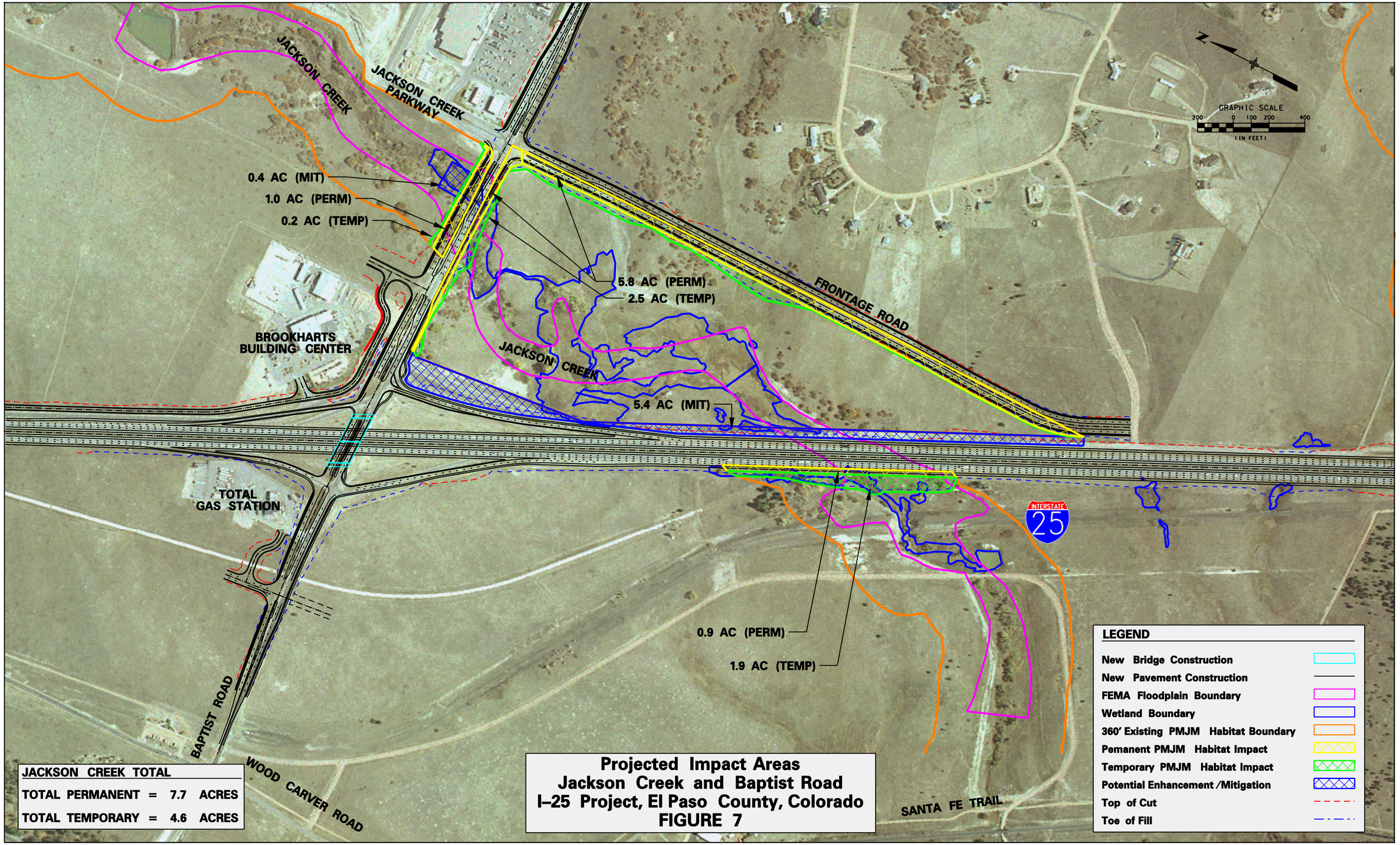
LEGEND

- New Bridge Construction
- New Pavement Construction
- FEMA Floodplain Boundary
- Wetland Boundary
- 360' Existing PMJM Habitat Boundary
- Pemanent PMJM Habitat Impact
- Temporary PMJM Habitat Impact
- Potential Enhancement /Mitigation
- Top of Cut
- Toe of Fill

Projected Impact Areas
Black Squirrel Creek North and Monument Branch
I–25 Project, El Paso County, Colorado
FIGURE 5



Projected Impact Areas
Smith Creek and Black Forest Tributary
I–25 Project, El Paso County, Colorado
FIGURE 6



Projected Impact Areas
Jackson Creek and Baptist Road
I–25 Project, El Paso County, Colorado
FIGURE 7

TEACHOUT CREEK
Permanent Impact = 1.1 Acres
Temporary Impact = 1.4 Acres

N

200 0 200

Scale: 1"=200'

TEACHOUT CREEK

I-25

STRUTHERS ROAD

HIGBY ROAD

LEGEND

- CUT LINE
- FILL LINE
- LIMIT OF CONSTRUCTION
- PMJM HABITAT BOUNDARY
- NEW EDGE OF PAVEMENT
- PERMANENT IMPACT AREA
- TEMPORARY IMPACT AREA

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Figure 8. Projected Impact Areas at Teachout Creek, I-25 Project, El Paso County, Colorado

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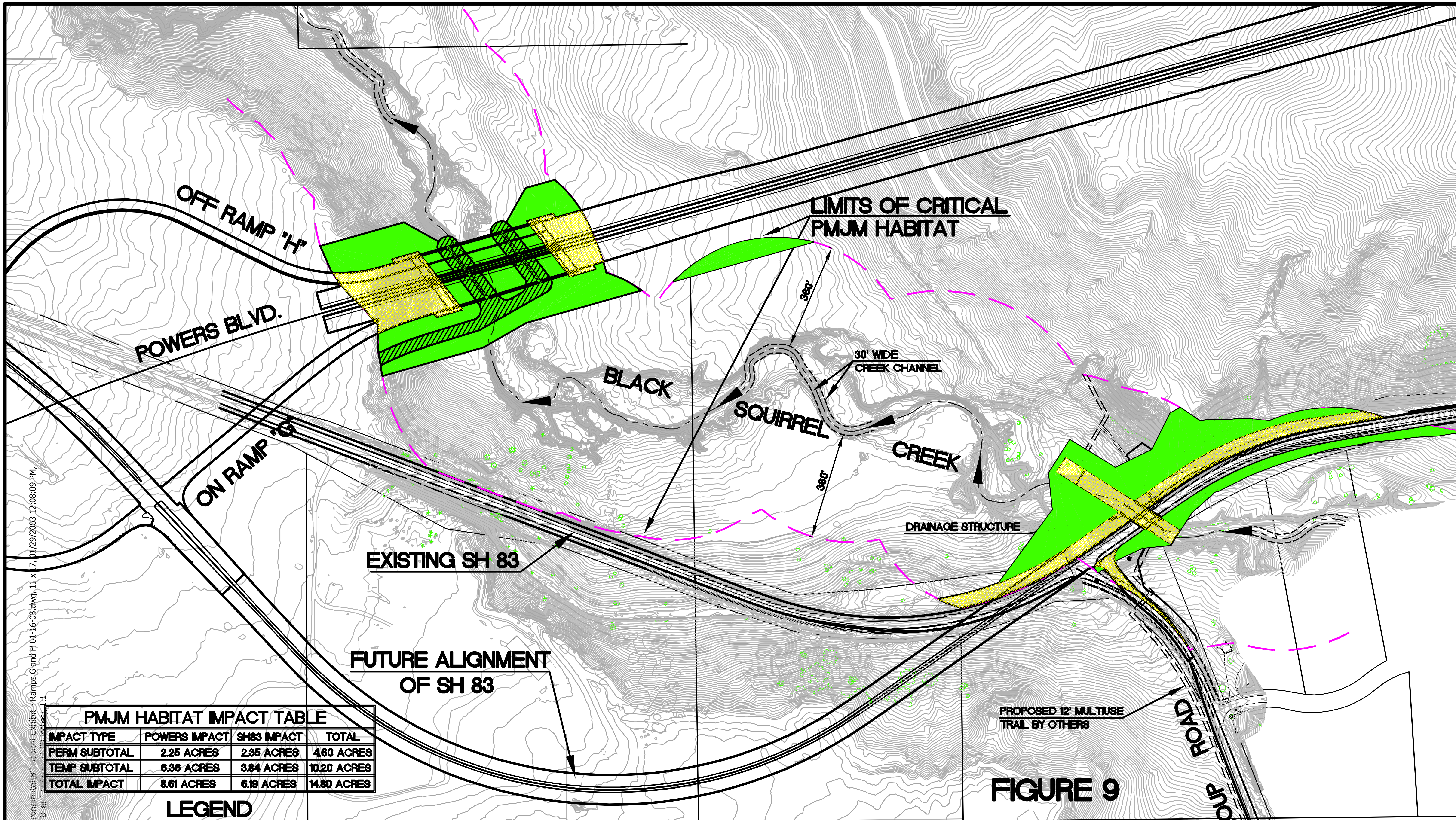
Figure 8



PMJM HABITAT IMPACT TABLE

IMPACT TYPE	POWERS IMPACT	SH83 IMPACT	TOTAL
PERM SUBTOTAL	2.25 ACRES	2.35 ACRES	4.60 ACRES
TEMP SUBTOTAL	6.36 ACRES	3.84 ACRES	10.20 ACRES
TOTAL IMPACT	8.61 ACRES	6.19 ACRES	14.80 ACRES

FIGURE 9

LEGEND

- RDWY AND BRIDGE STRUCTURE COVERAGE AREA (PERM IMPACT)
- GRADED ARES (CUT OR FILL) (TEMP IMPACT)
- CONSTRUCTION HAUL ROAD AND CRANE PAD GRADING (TEMP IMPACT)

DEPARTMENT OF TRANSPORTATION
Region 2

URS
9960 Federal Drive, Suite 300
Colorado Springs, CO. 80921
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Fax (719) 531-0007

PROJECTED IMPACT AREA POWERS BOULEVARD NORTH AND SHOUP ROAD EL PASO COUNTY, COLORADO

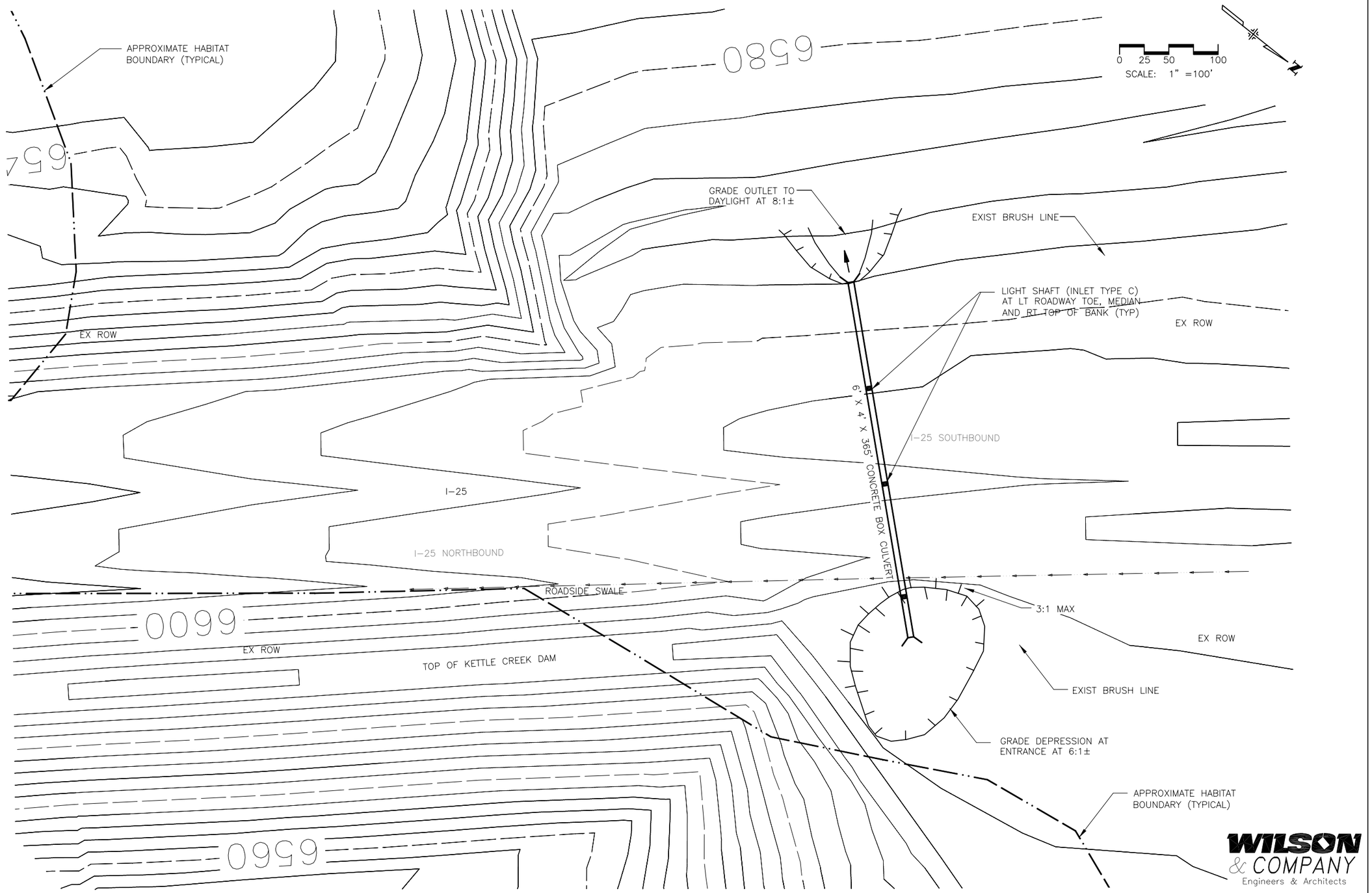

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Figure 10 Proposed Culvert Under I-25 at Kettle Creek
I-25 Project, El Paso County Colorado

Designer:	WCD		
Detailer:	MAB		
Sheet Subset:	STORMWATER	Subset Sheet:	1 of 1

Project No./Code
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Figure 10

APPENDIX A. EVALUATION OF OTHER SPECIES IN THE I-25 PROJECT AREA

Table 1. Colorado Natural Heritage Program Environmental Review. Status of Rare and/or Imperiled Species known from the Interstate 25 Corridor Project Area in El Paso County, Colorado

Scientific Name	Common Name	Federal Listing Agency	Status
BIRDS			
Buteo regalis	ferruginous hawk	FS/BLM	SC
Charadrius montanus	mountain plover	FS/BLM	SC
Dendroica graciae	Grace's warbler	-	-
Grus americana	whooping crane		FE, SE
Haliaeetus leucoccephalus	bald eagle	-	FT, ST
Seiurus aurocapillus	ovenbird		
FISH			
Etheostoma cragini	Arkansas darter	FS	ST
INSECTS			
Amblyscirtes simus	Simius roadside skipper		
Callophrys mossii schryveri	moss's elfin		
Celastrina humulus	hops feeding azure		
Hemileuca grotei diana	A buckmoth		
MAMMALS			
Cynomys gunnissoni	Gunnison's prairie dog		
Cynomys ludovicianus	black-tailed prairie dog		SC
Plecotus townsedii pallescens	Townsend's big-eared bat	FS/BLM	
Vulpes velox	swift fox	FS	SC
Zapus hudsonius preblei	Preble's meadow jumping mouse	FS	FT, ST
NATURAL COMMUNITIES			
Alnus incana.mesic graminoid	montane riparian shrubland		
Alnus incana-Cornus sericea	thinleaf alder-red osier dogwood riparian shrubland		
Muhlenbergia torreyi	Shortgrass prairie		
Pinus ponderosa/Quercus gambelii	foothills ponderosa pine scrub woodlands		
Populus angustifolia/Salix exigua	narrowleaf-cottonwood riparian forests		

FS=Forest Service, BLM=Bureau of Land Management, SC=State Species of Special Concern, FE=Federal Endangered, FT=Federal Threatened, ST=State Threatened

Scientific Name	Common Name	Federal Listing Agency	Status
Quercus gambelii/Carex inops	mesic oak thickets		
Salix exigua/mesic graminoid	coyote willow/mesic graminoid		
Stipa neomexicana	great plains mixed grass prairies		
Symphoricarpos occidentalis	snowberry shrubland		
PLANTS			
Ambrosia linearis	plains ragweed	FS	
Amorpha nana	dwarf wild indigo		
Aquilegia chrysantha var. rydbergii	golden columbine	BLM	
Cypripendium calceolus ssp parviflorum	yellow lady's slipper		
Eriogonum brandegeei	brandegee wild buckwheat	FS/BLM	
Hypoxis hirsuta	yellow stargrass		
Juncus brachycephalus	small-headed rush		
Nama dichotomun	livemore fiddleleaf		
Nuttallia chrysantha	golden blazing star	BLM	
Potentilla ambigens	southern rocky mountain cinquefoil		
Ribes americanum	American currant		
Unamia alba	prairie goldenrod		
Viola pedatifada	prairie violet		
Woodsia neomexicana	New Mexico cliff Fern		

FS=Forest Service, BLM=Bureau of Land Management, SC=State Species of Special Concern, FE=Federal Endangered, FT=Federal Threatened, ST=State Threatened

Further screening was conducted to refine this list and other data sources to include all threatened, endangered and species of concern (TES) that could potentially be found at the project site. Screening criteria included a review of known populations or habitats, elevation ranges, habitat types and drainage ways. The following species have been identified that may be present in the general vicinity of the study area. A brief species profile and presence/absence determination is provided.

Ute Ladies'-tresses Orchid (*Spiranthes diluvialis*)

The Ute ladies'-tresses orchid (Orchid) is listed as federally threatened under the ESA. The Orchid occurs in seasonally moist soils and wet meadows near springs, lakes, or perennial streams and their associated floodplains below 6,500 feet elevation in certain areas in Utah, Colorado, Idaho, Wyoming, and Nevada. Typical sites include old stream channels and alluvial terraces, subirrigated meadow and other sites where the soil is saturated to within 18" of the surface at least temporarily during the spring or summer. Surveys are required for appropriate sites below 6,500 feet elevation in the Fountain Creek 100-year floodplain and perennial tributaries from the Front Range to the southern boundary of El Paso County. Sites not requiring a survey included highly disturbed or modified sites such as highway rights-of-way, upland sites including prairie dog towns, shortgrass prairie and sagebrush rangeland, sites entirely inundated by standing water including monocultures of cattails or Olney's three-square. The habitat characteristics present within the study area limit the probability of this species being present. In addition, no populations are known to exist within the limits of the study area.

Colorado Butterfly Plant *(Gaura neomexicana spp. coloradensis)*

The Colorado butterfly plant is a short-lived, perennial herb endemic to moist soils in mesic or wet meadows of floodplain areas in southeastern Wyoming, northcentral Colorado, and extreme western Nebraska. This early to mid-seral stage species occurs primarily in habitats created and maintained by streams active within their floodplains, with vegetation that is relatively open and not overly dense or overgrown. The disturbance of riparian areas that contain native grasses by agricultural conversion, water diversions, channelization, and urban development threaten the species existence (Federal Register, 2000). These habitat characteristics are present within the study area, but the highly disturbed nature of the area limits the probability of the presence of this species. In addition, the species distribution does not extend south into El Paso County and no known population of the butterfly plant exists in El Paso County.

Bald eagle *(Haliaeetus leucoephalus)*

The bald eagle is listed as federally threatened under the ESA. Bald eagles are usually winter residents of Colorado. These raptors are commonly found in lower elevation grasslands and semi-deserts near prairie dog towns and deciduous tree dominated riparian corridors and reservoirs. Although no bald eagle nests or individuals were observed within or near the study area during the investigation, many of the mature riparian deciduous trees present along the riparian corridors may provide potential habitat for this species. The proposed action is not likely to adversely affect the continued existence of the species.

Black-footed ferret *(Mustela nigripes)*

The black-footed ferret is listed as a federally endangered species under the ESA. The ferret is dependent on prairie dog colonies for food, shelter and nursing. A prairie dog

colony averaging 80 acres is required to support a viable population of ferrets. Three prairie dog colonies were observed within the study area (see below). All of the existing colonies are smaller than 80 acres and therefore would not qualify as ferret habitat (USFWS, 1989). The proposed action is not likely to adversely affect the continued existence of the species.

Mexican spotted Owl *(Strix occidentalis lucida)*

The Mexican spotted owl is listed as a threatened species under the ESA. Habitat evaluated from the south half of the Air Force Academy extending south until Garden of the Gods Road contains plant species characteristic to Mexican spotted owl habitat (USFWS, 1995). The potential habitat within the I-25 study area lacks the dense canopy and complexity that Mexican spotted owls inhabit. In addition, the noise pollution caused by I-25 traffic deters regular Mexican spotted owl visits. The owls may travel across or rarely visit lands within the study area. The proposed action is not likely to adversely affect the continued existence of the species.

Arkansas darter *(Etheostoma cragini)*

The Arkansas darter is a state threatened fish species that has been found south of Colorado Springs in natural springs adjacent to Fountain Creek. The study area does not extend to the identified darter populations. The proposed action is not likely to adversely affect the continued existence of the species.

Preble's Meadow Jumping Mouse *(Zapus hudsonius preblei)*

The Preble's meadow jumping mouse is currently classified by the USFWS as threatened. Mouse populations and habitat have been identified within the study area and are the subject of this PBA.

State Species of Concern

Mountain plover *(Charadrius montanus)*

The mountain plover is a Colorado species of concern. Plovers are summer residents of the Colorado eastern plains. Overgrazed short grass prairies where cacti and prairie dog towns are present are preferred by the plover. There was no evidence of plover nesting within the study area during the investigation, but plovers may travel across or rarely visit lands within the study area. The proposed action is not likely to adversely affect the continued existence of the species.

Swift fox *(Vulpes velox)*

The swift fox is no longer a candidate species for listing under the ESA; however, the swift fox remains a state species of concern (USFWS, 2001). Typical habitat of this fox species consists of short-grass, mixed-grass and sand hill prairies that are relatively flat, gentle rolling topography. Dens were not evident during the site visit within the study area. Potential swift fox foraging habitat does lie within the subject study area. However, it is unlikely that critical habitat will be impacted due to the degraded condition of the habitat within the study area. The proposed action is not likely to adversely affect the continued existence of the species.

American peregrine falcon *(Falco peregrinus anatum)*

The American peregrine falcon is a Colorado species of concern. The falcon is a migratory bird that resides in the mountains during summer (Colorado Birds, 1992). Wetlands near cliffs and higher perching structures are used by falcons for foraging. The habitat along the study area does not contain quality habitat for the falcon. Cliff areas are limited to the Garden of the Gods Road on the west side of I-25 where the drainage is very degraded and does not contain sufficient water flow to support fish. Falcons have been observed on top of city buildings; however, this area has been impacted and quality of drainages within the city is poor. The drainages in the vicinity of potential falcon perching structures is low quality, and in most cases, does not support resident fish populations as sustaining food source. Impact to critical falcon habitat is unlikely as a result of the preferred action, due to the current degraded state of the habitat. The proposed action is not likely to adversely affect the continued existence of the species.

Black-tailed prairie dog *(Cynoys ludovicianus)*

Prairie dogs have become the subjects of important political, social, economic and ecological issues in the Front Range region of Colorado. Nationally, less than 2 percent of pre-settlement prairie dog populations exist today, due to a combination of habitat loss and targeted extermination. The USFWS has determined that adding the black-tailed prairie dog to the federal list of threatened or endangered species is “warranted” but “precluded” at this time due to administrative and fiscal limitation within the agency. Black-tailed prairie dogs are diurnal, colonial, burrowing rodents. Black-tailed prairie

dogs are herbivores and feed on a variety of vegetation, including grasses and forbs, and to a lesser extent seeds and insects. Short-grass species commonly eaten by prairie dogs include buffalo grass and blue grama. Prairie dogs play an important role in the overall ecosystem, not only creating a unique ecosystem for their species but also creating habitat and serving as a food source for a wide number of other federally or state-listed threatened or endangered species.

Three prairie dog communities have been located within the study area. The southernmost community is located on the east side of I-25 extending from the intersection of State Road 16 north approximately 3,000 feet by approximately 1000 feet wide (70 acres). The second community is located on the west side of I-25 at the Northgate Boulevard interchange and extends approximately 600 feet by 200 feet (3 acres). The third community is located on the west side of I-25 near Teachout Creek approximately 8,800 feet (1.7 miles) south of the interchange with State Highway 105 and I-25. This community is bisected by Teachout Creek and is approximately 500 feet by 500 feet (6 acres) on the north side of the Creek and 600 feet by 150 feet (2 acres) on the south side of the Creek. The limits of construction disturbance of the preferred action extend within close proximity to each of the identified colonies. The proposed action may result in direct disturbance to the colonies.

Appendix B. Photographs of Proposed Project Areas, Programmatic Biological Assessment, El Paso County, CO.

Photo 1. Pine Creek on the east side of I-25, north of Academy Boulevard. The stream channel is lined with sandbar willow (*Salix exigua*) here, but only upland grassland between the stream and I-25 would be disturbed. 11/7/02.

Photo 2. This is the east side of I-25 over Kettle Creek, on the toe slope of the dam to the east (right). Marginal upland grassland will be affected by widening here. 11/7/02.

Photo 3. This is the northbound bridge over Black Squirrel Creek South. Both north and southbound bridges will be replaced (new bridges will be widened to the outside), with additional shoulder and embankment work. The open median will remain. 11/7/02.

Photo 4. This is the concrete box culvert on Black Squirrel Creek North. Note that the drainage also serves as a trail. The CBC will be replaced and lengthened. 11/7/02.

Photo 5. This is the north end of the Monument Branch wetland complex in the I-25 median. There are possible habitat restoration/enhancement opportunities here. 11/7/02.

Photo 6. This is high quality Preble's habitat in the I-25 median. The double box culvert under the northbound lanes conveys Monument Branch under I-25. There is a similar structure under the southbound lanes. Both will be extended and replaced. 11/7/02.

Photo 7. This is the double box culvert under southbound I-25 lanes at Smith Creek (there is a similar structure under northbound lanes). Note recent beaver activity. Both structures will be extended to accommodate roadway widening. 11/7/02.

Photo 8. This is the Smith Creek riparian area in the Northgate interchange median. New fill slopes will affect some of the median areas. 11/7/02.

Photo 9. This is the double CBC under I-25 (east side) on Black Forest Tributary. Both ends of the culvert will be extended, causing permanent and temporary impacts. 11/7/02.

Photo 10. This is the Frontage Road crossing on Jackson Creek south of Baptist Road. This road is scheduled for replacement and much of the area can be converted to habitat. 11/7/02.

Photo 11. This is the double CBC on the east side of I-25 at Teachout Creek, with a similar structure on the west side. Both structures will be widened. 11/7/02.

Photo 12. Looking south at the Powers North crossing at Black Squirrel Creek. There will be a new bridge structure here. This area has poor riparian habitat. 1/22/03.

Photo 13. This is the east side of Shoup Road at S.H. 83 on Black Squirrel Creek. There is high quality riparian habitat and Preble's were found in this area. 1/22/03

Photo 14. This is the east side of Shoup Road. The riparian area is very limited in this downcut section of Black Squirrel Creek. Preble's were not found in this area. 1/22/03.

Photo 15. Looking north from the top of the Kettle Creek dam on the east side of I-25. Note the diagonal drainage at the top right of the photo with heavy shrub cover. If Preble's can move through this area and over the dam, a new culvert could be installed under I-25 that would allow movement under the highway. 11/07/02.

APPENDIX C. BEST MANAGEMENT PRACTICES FOR CONSTRUCTION PROJECTS

The following are a set of general guidelines that will be reviewed by all project staff. Best management practices (BMPs) are intended to avoid and reduce potential impacts to Preble's populations and habitat. They are most effective when there has been timely communication among engineering, construction and environmental staff.

BMPs may be superceded by more stringent or general conditions that are established in project specific biological opinions. The numbered BMPs below are not in order of priority.

1. Identify and prioritize habitat areas that are subject to disturbance. For example, large willow patches or prime hibernation areas shall be avoided if possible. Explore various options with project designers and stretch design flexibility to the greatest extent possible if these discussions result in reduced or avoided site impacts.
2. Vegetation that has to be removed may be salvaged for replanting, or may have other on-site uses (brush piles for mouse cover). Consult with the project biologist.
3. Engineers and construction staff shall consult with the project biologist if there are any changes in plans or if there are any questions regarding the proposed activities within Preble's habitat.
4. Limit equipment entrance/exit areas to a single location if possible. Construction access routes shall overlap with permanently disturbed areas to the greatest extent possible.
5. Minimize Preble's habitat impacts by coordination with equipment operators to find out specifically where they will drive. There are often last-minute changes that can lead to further reduction in site impacts.
6. Minimize impacts to vegetation. This might mean pruning trees rather than tree removals, or cutting shrub stems and allowing sprout re-growth, rather than grubbing out entire root system.
7. Minimize time periods with bare soil. Vegetation cover is not only beneficial for the mouse, but affords the site better resistance to invasion from non-native weeds.
8. Weed control measures shall be consistent with guidelines established by state, local and federal governments.
9. Installation of chain-link or plastic (orange) fencing to establish no-work zones as early in the project as possible.
10. Schedule project construction and other habitat disturbances during the dormant season if possible. Most plants are more resilient to disturbances when they are dormant than when they are actively growing. This timing also coincides with the mouse hibernation period, and mouse feeding, movement, and reproduction will not be affected.

11. Select native plant species for revegetation, and local varieties if available. All revegetation plans shall be consistent with revegetation and monitoring guidelines established in the pertinent biological opinion.
12. Stockpile soil from disturbed natural areas; it can often be used as a seed bank to re-establish native plant species.
13. The project biologist shall assess the presence of bullfrogs in the project areas, and consider implementing control measures for this introduced species that preys on Preble's meadow jumping mice.
14. Be cautious in removal of any beaver dams. Beaver dams are likely to improve habitat for jumping mice by creating wider riparian corridors and encouraging willow growth. Prior to removal of any beaver dam, a careful evaluation and assessment of the impact of this action on the entire drainage, especially the effects of flooding and scouring that may result, will take place.
15. Consider mitigation for altered hydrology due to upstream development. This might include habitat-friendly detention basins or channel stabilization actions.
16. Consider impacts to upland habitat. The FWS protects habitat at least 91.5 m (300 ft) from the edge of the 100-year flood plain. Establish scrub oak thickets for day nests and hibernacula, and try to get easements in order to extend buffers where good upland habitat is present.
17. Riparian areas are subject to floods. Although exposed sand bars and bank margins are often covered with riparian vegetation, planting such areas after project disturbance can be risky in the short term. It is important to replant these areas quickly after project completion.
18. Avoid introduction or excess application of chemicals into aquatic ecosystems. Limit soil stabilizers, sterilants, growth inhibitors, de-icing salts, etc.
19. Prevent spilled fuels, lubricants, or other related materials from entering Preble's habitat.
20. Any project-related construction trash (e.g.: cement blocks, asphalt piles, cans, bottles, scrap lumber, etc.) will be removed from habitat areas at project completion.
21. Vehicle traffic in riparian areas will be minimized to the extent practicable.
22. Equipment staging areas in Preble's habitat are prohibited.
23. Use directional drilling/boring if possible when relocating utility lines in all habitat areas.
24. Night-time work is not allowed in the active season unless specifically permitted in the biological opinion (Preble's are nocturnal animals).

APPENDIX D. POTENTIAL CONSERVATION ACTIONS FOR PROGRAMMATIC BIOLOGICAL ASSESSMENT, EL PASO COUNTY, CO

All actions presented here are at various stages of development and are presented as examples of specific conservation measures that may be incorporated into the project.

a. Jackson Creek flows through two pipes (2-foot diameter pipes, 130 feet long) under a frontage road on the east side of I-25, as it leaves the CDOT 65-acre conservation area. These pipes probably deter most Preble's movements and act as a significant movement filter. As part of the Baptist Road/I-25 interchange reconstruction, CDOT will remove this road and restore habitat, eliminating this movement filter. Habitat creation and restoration will increase Preble's habitat by an estimated 3.6 acres. Jackson Creek then flows under I-25 through a bridge with an earthen bottom. This underpass has degraded habitat (paved in places). This area will also be improved and should markedly improve Preble's movement between the east and west sides of I-25. A monitoring plan will be proposed to look at mouse movement under I-25.

b. A land bridge/culvert system on Kettle Creek to link Preble's populations that are now separated by a large dam and I-25. Preble's are now unable to move through the very long pipe (approximately 0.5 mile long) through the dam and under I-25. FHWA/CDOT are proposing to provide a "green bridge" over the north side of the dam, using the best existing habitat features to enhance movement[1]. This area will be evaluated and habitat may be enhanced over the dam if the need is demonstrated (there may be sufficient vegetation on the north side of the dam to allow for passage (see Appendix B, Photo 15). Assuming that Preble's make it over the dam, a culvert will be constructed under I-25 to enhance movement to Kettle Creek habitat on the west side of I-25 (see Figure 10). Final plans are subject to approval by USAFA staff. A monitoring plan will be proposed to look at mouse movement through the installed culvert.

c. Removal of loop ramps at the Northgate interchange and restoration of upland habitat. The area restored will be determined during the final design phase. Final plans are subject to approval by USAFA staff.

d. Installation of a larger pipe under Baptist Road on Jackson Creek, facilitating mouse movement under the road.

[1] A Preble's was observed in the area between the dam and I-25 on October 12, 2001. The most likely passageway for the mouse to reach this location was over the north side of the dam on the east side of I-25 (the proposed green bridge), rather than by crossing I-25 from the west side.

e. Purchase of 6.65 acres of Preble's habitat on Dirty Woman Creek on the north of SH 105 (the Brookmoor property). Future plans include creation of new wetland/riparian areas, and restoration of a mowed upland. This property is contiguous with CDOT-owned property at the Monument interchange, and is part of the Dirty Woman Creek habitat corridor that FHWA/CDOT has been assembling over the past few years.

f. A conservation easement on Monument Creek for 3.2 acres (the Etter property) near the confluence with Dirty Woman and Monument Creeks. This property is contiguous with previous CDOT-acquired conservation easements and is part of the Dirty Woman/Monument Creek habitat corridor.

g. Purchase and restoration of approximately 35 acres of Preble's habitat on Jackson Creek on the west side of I-25 (Shuck property). This property is contiguous with the previously purchased CDOT conservation property on the east side of I-25, and establishes a protected corridor on Jackson Creek from Baptist Road to the Monument Creek confluence.

h. Habitat restoration of approximately 1.2 miles of stream habitat on Monument Creek. Successful restoration would provide a habitat linkage that would unite South and North Monument Creek Preble's populations, as well as unite the Beaver/Hay Creek population to Monument Creek. CDOT conducted a trapping survey in 2002 to determine Preble's distribution on the ranch and adjacent properties, and established four grazing exclusion plots to assess the level of restoration needed. Negotiations are on-going with the landowner.

i. Habitat restoration on the Willow Springs Ranch, just north (and contiguous) with the 1.2 miles of stream habitat discussed above. Restoration is anticipated on Monument Creek, as well as the Teachout/Monument Creek confluence. This is another linkage project that would unite the Teachout/Monument Creek Preble's populations.

j. Potential habitat enhancements/creation south of the Northgate interchange, within the I-25 median. Some of these areas have a source of groundwater and may be converted to wetlands/riparian mouse habitat, depending on results of more intensive site studies. This may also lead to a new habitat linkage between two existing habitat areas. Final plans are subject to approval by USAFA staff.

k. Potential construction of a habitat-friendly detention basin on the north side of Baptist Road on Jackson Creek. This detention pond would protect the CDOT conservation area on the south side of Baptist Road from a significant up-gradient erosion problem resulting from non-CDOT projects. The detention basin would not be required as part of the roadway project.

l. Purchase and restoration of 12.8 acres of Preble's habitat on Dirty Woman Creek (Pastimes and WL homes properties), part of the Dirty Woman Creek habitat corridor.

m. Purchase and protection of 6 acres Preble's habitat on Dirty Woman Creek (Beck property), part of the Dirty Woman Creek habitat corridor.

United States Department of the Interior

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

IN REPLY REFER TO:
ES/LK-6-CO-03-F-021
Mail Stop 65412

William C. Jones, Division Administrator
Colorado Federal Aid Division
U.S. Department of Transportation
Federal Highway Administration
555 Zang Street, Room 250
Lakewood, Colorado 80228

Dear Mr. Jones:

In accordance with section 7 of the Endangered Species Act (Act) as amended (16 U.S.C. 1531 et seq.) and the Interagency Cooperative Regulations (50 CFR 402), this is the U.S. Fish and Wildlife Service's (Service) final biological opinion on impacts to federally-listed endangered and threatened species associated with Federal Highway Administration (FHWA) funding of three projects in El Paso County, Colorado. The three project areas are Interstate 25 (I-25) north of Colorado Springs, Powers Boulevard between State Highway 83 (SH83) and I-25, and the Shoup Road/SH83 intersection reconstruction.

This biological opinion is based on the proposal as described in the February 12, 2003, report by Ensight Technical Services, Inc. (Ensight) entitled "Programmatic Biological Assessment: Interstate 25 Corridor, Powers Boulevard North, and Shoup Road Projects in El Paso County, Colorado" (Biological Assessment). The Service received the Biological Assessment on March 10, 2003. The Service concurs with the FHWA's determination that the proposed projects are likely to adversely affect the threatened Preble's meadow jumping mouse, *Zapus hudsonius preblei* (Preble's).

CONFERENCE/CONSULTATION HISTORY

On May 13, 1998, Preble's was listed as threatened under the Act. Full protection for Preble's became effective on June 12, 1998. Several drainages in the project areas containing riparian and wetland habitat suitable to Preble's will be affected by the three proposed projects. Trapping surveys for Preble's have been conducted on all but two of these drainages, and presence confirmed. Drainages affected by the proposed projects are Pine Creek, Kettle Creek, Black Squirrel Creek South, Black Squirrel Creek North, Monument Branch, Smith Creek, Black Forest Tributary (not trapped), Jackson Creek, and Teachout Creek (not trapped).

On July 17, 2002, critical habitat for Preble's was proposed. In El Paso County, critical habitat was proposed on Teachout Creek, Jackson Creek, Black Forest Tributary, Smith Creek, Monument Branch, and Black Squirrel Creek. On June 23, 2003, critical habitat was finalized and did not include any of the drainages proposed in El Paso County.

A chronology of the consultation follows:

June 29, 2000, August 8, 2000, November 15, 2000. Meetings of Panel of Preble's experts convened by FHWA/CDOT to discuss impacts due to reconstruction of I-25 and related conservation measures.

May 14, 2001. Submittal of the Panel report entitled, "Preble's Meadow Jumping Mouse Issues Within the I-25 Project Area in Northern El Paso County, Colorado."

February 27, 2002. Meeting to discuss the I-25 Environmental Assessment and taking a programmatic approach to the section 7 consultation. CDOT, FHWA, Service, Ensight, and Wilson & Company (Wilson) representatives were present.

August 2, 2002. Field meeting to discuss and review habitat areas on the U.S. Air Force Academy (USAFA) property and other I-25 project areas with Ensight, CDOT environmental and engineering staff, design engineers from Wilson and PBS&J, the Service, and the USAFA in attendance.

November 13, 2002. Meeting to further discuss programmatic approach to the section 7 consultation. FHWA/CDOT proposed to add the Shoup Road/SH83 intersection reconstruction and the Powers Boulevard North construction to the process. Conservation strategies were discussed. Ensight, CDOT environmental and engineering staff, design engineers from Wilson and PBS&J, the Service, and the USAFA representatives attended.

December 5, 2002, January 13, 2003. Met to continue discussion of conservation strategies, success criteria, and project and consultation schedules. Made determination that programmatic approach would include an "umbrella" Biological Assessment describing the worst-case scenario of impacts due to all three projects and the conservation strategies, an "umbrella" biological opinion, and site-specific consultation documents on each project as their construction details are refined. Ensight, CDOT environmental and engineering staff, design engineers from Wilson and PBS&J, the Service, and the USAFA representatives attended.

January 21, 2003. Field meeting between Ensight and the Service to visit Shoup Road and Powers North sites containing potential Preble's habitat that will be impacted by the project.

March 10, 2003. Final Programmatic Biological Assessment received by the Service.

BIOLOGICAL OPINION

Description of the Proposed Action

Three projects are addressed in this programmatic consultation: 29 miles of I-25 reconstruction in northern El Paso County; reconstruction of the Shoup Road/SH83 intersection; and extension of Powers Boulevard from SH83 to its northern terminus at I-25 (Figure 1).

I-25 Reconstruction

The proposed action for improving I-25 capacity will take place in El Paso County along a 29-mile stretch of I-25 between the SH16 and Monument interchanges (Figure 1). Construction impacts will fall into two general categories: roadway widening and interchange reconstruction.

Some safety improvement projects on I-25 have already begun including the Circle Drive/Lake Avenue interchange, the Nevada Avenue/Tejon Street interchange, Bijou Street to Fillmore Street (including the Uintah Street interchange and the Fontanero Street interchange), the Woodmen Road interchange, and the North Academy Boulevard interchange. All of these projects, with the exception of the Monument and North Academy interchanges, are located outside of the area occupied by the mouse. Some of these drainages were formerly occupied, but

the Service has issued block clearances based on numerous negative trapping surveys. For the reconstruction of the Monument interchange, which is located within mouse habitat, a separate Biological Assessment was prepared by FHWA and CDOT, and a biological opinion was issued in August 2000. The North Academy interchange was under construction at the time Preble's was listed (May 1998), and FHWA/CDOT conducted a section 7 conference with the Service for that project.

It is anticipated that the I-25 project will be constructed in three phases. Phase I of the project will add one lane in each direction, resulting in three through-lanes per direction between South Circle Drive and Briargate Parkway. Phase II of the project will add one lane in each direction between Briargate Parkway and the Monument Interchange. Phase III, the final configuration of I-25 through northern El Paso County, would add one high occupancy vehicle (HOV) lane in each direction between Briargate Parkway and the Martin Luther King bypass, and one general purpose traffic lane in each direction between the Circle/Lake interchange and South Academy Boulevard. All lanes south of the Interquest Parkway interchange will be added in the median between the existing northbound and southbound lanes of the interstate. For lanes north of Interquest Parkway, the median is either not wide enough to accommodate the new lanes, or the median has Preble's habitat. Lanes in this area will be added to the outside of the existing pavement.

Proposed construction will affect a 20-foot (6.1-meter) wide area within the median and 20 feet (6.1 meters) in each direction outside the existing roadway. The average right-of-way (ROW) width is 300 feet (91.5 meters), which includes all paved lanes and shoulders. Most of the roadway widening will take place within the ROW. Much of this ROW area is either non-habitat (because of paving or mowing), or moderate to poor-quality habitat.

The proposed action also includes six major interchange reconstruction projects:

1. Baptist Road interchange, Exit 158;
2. Northgate/Powers interchange, Exit 156;
3. North Nevada Avenue/Rockrimmon interchange, Exit 148;
4. Fillmore Avenue interchange, Exit 145;
5. Bijou Street interchange, Exit 142; and
6. Cimarron (US Highway 24) interchange, Exit 141.

Of the interchanges listed above, Baptist and Northgate/Powers are located in areas with known Preble's habitat; the Nevada/Rockrimmon interchange is located at the northern edge of the Colorado Springs Preble's block clearance zone; and the Fillmore, Bijou and Cimarron interchanges are located in the center of the Colorado Springs Preble's block clearance zone.

The Baptist, Northgate/Powers and Nevada/Rockrimmon interchanges at areas of Preble's habitat are described below.

The Baptist Road interchange, at I-25's Exit 158, exists as an unsignalized diamond interchange where a bridge carries a two-lane cross-street over the four-lane freeway. FHWA/CDOT are proposing to replace the existing facility with a diamond interchange configuration. The reconstructed interchange will have an expanded bridge to carry more lanes of Baptist Road traffic over more lanes of I-25 traffic. Local business access and frontage roads will also be redesigned. The existing frontage road in the southeast quadrant of the interchange crosses Jackson Creek and adjacent Preble's meadow jumping mouse habitat. CDOT has purchased 65 acres here for conservation purposes. Under the proposed action, the existing frontage road will be removed and located on the east boundary of the conservation area.

The existing Northgate interchange, at I-25's Exit 156, provides access for Northgate Road, the main visitor entrance to the USAFA. South of the interchange, free-flow ramps are planned for a system-to-system interchange connecting I-25 and the planned Powers Boulevard. The entire interchange complex, including the I-25 mainline, is situated on USAFA property. CDOT

coordinated with USAFA to develop a proposed action. Preble's habitat is found along Smith Creek (immediately south of the Northgate interchange) and also in the Monument Branch tributaries at the south end of the proposed Powers Boulevard ramps. Replacement of substandard loop ramps at Northgate Road with a diamond interchange configuration may allow for restoration of upland habitat for the mouse. Minimization of adverse impacts to Preble's habitat was an important factor in the concept design process.

Under the proposed action, substandard ramps at I-25's Exits 147 (Rockrimmon Boulevard), 148A (North Nevada Avenue), and 148B (Corporate Center Drive) will be replaced with a consolidated split-diamond interchange configuration, improving capacity and safety for all roadways involved. Monument Creek flows southward under the I-25 bridges here. Due to the complexities of the local roadway system here, ten interchange concepts were developed for consideration. The concept design process attempted to minimize impacts to wetlands, riparian areas and floodplains. These efforts will prove beneficial if Preble's is able to recolonize this northernmost reach of the Colorado Springs block clearance zone.

Storm drainage improvements north of the North Academy Boulevard interchange, which is primarily in a rural setting, will consist of roadside and median grass-lined swales and buffer strips, and cross-culverts and bridges. South of the North Academy Boulevard interchange the interstate passes through a highly urbanized area of Colorado Springs. Storm drainage in this area will predominantly consist of storm sewer systems, pipes, bridges and other structures and devices common to urban storm drainage. Temporary erosion and sedimentation control improvements for construction activities will be included in all projects. Permanent detention/stormwater quality ponds will be constructed in interchange infield and other open areas where feasible. Other permanent stormwater quality Best Management Practices (BMPs) will be constructed for all drainage discharge locations, as practical.

Descriptions of reconstruction on I-25 at specific areas of Preble's habitat follows.

Pine Creek

Between North Academy and Briargate, the new east edge of pavement will generally match the existing edge of pavement along the southerly half of this reach of highway. The new pavement edge will be about 5 feet to the west of the existing edge of pavement along the northerly half of this reach. Construction will be done in two stages. First, all traffic will be shifted to one side of the existing highway, either northbound or southbound, while the other side is being fully constructed. When construction is finished on the first side, all traffic will be shifted to that side and the construction of the other side will be completed. It is possible this staged construction will be completed as two separate construction projects.

Kettle Creek

Highway reconstruction in the Kettle Creek area includes one additional lane in each direction with shoulders constructed within the existing open median and minor shoulder widening on the east side. The highway embankment side slopes will also be reconstructed for safety. Construction will be completed in two main stages, as described for Pine Creek. A new culvert to connect habitat on opposite sides of I-25 may be installed, depending on the outcome of feasibility studies and discussions with the USAFA, who owns part of the property.

Black Squirrel Creek South

Black Squirrel Creek South crosses I-25 approximately 3,850 feet north of Interquest Parkway through a divided median. The existing crossing is a separate 3-span bridge for both the northbound and southbound roadways, each having a total span length of about 105 feet and a clearance of 15 feet. The existing median opening is approximately 24 feet.

Highway reconstruction in this reach includes one additional lane in each direction with shoulders constructed on the outside of both the northbound and southbound roadways. The existing open median will remain. The highway embankment side slopes will also be improved for safety. Separate new bridges will be constructed for both the northbound and southbound roadways. The new bridges will likely be multi-span that have a total span length of about 120 feet and will maintain the existing clearance of about 15 feet. The bridges will be about 63 feet wide with an approximate 24-foot-wide median opening. Construction will be done in two main stages, as described for Pine and Kettle Creeks.

Black Squirrel Creek North

I-25 will be widened from two lanes to three lanes in each direction, with construction to the outside of the existing pavement (to protect habitat in the median). The new construction will occur at the existing I-25 grade (elevation) and location. Additional widening will be required for the Powers Boulevard northbound to southbound I-25 ramp connection. This ramp connection requires an acceleration lane that will add 12 to 24 feet of widening to the southbound I-25 lanes. An additional 12 feet of widening on the northbound I-25 lanes for the ramp from I-25 northbound to Powers Boulevard southbound is also required.

In addition to pavement reconstruction and widening, hydraulic structures will be replaced or extended. Some of these structures are located within mouse habitat areas. There are two existing 12 foot by 10 foot concrete box culverts (CBCs) just north of Black Squirrel Creek. These structures will require significant extensions and some rehabilitation work on both sides of the structure.

Monument Branch

The limits of work in this area are from south of Monument Branch extending north to south of Smith Creek. I-25 will be widened from two lanes to three lanes in each direction. In addition to the new lanes, there will be additional lanes required to accommodate acceleration and deceleration lanes for the entrance and exit ramps to I-25 from the Powers Boulevard interchange.

Powers Boulevard is a major north-south highway that runs along the eastern edge of Colorado Springs, Colorado. Powers Boulevard is planned to intersect I-25 approximately one-half mile south of the existing Northgate interchange. Powers Boulevard will connect to I-25 through a series of direct connecting ramps. In addition, there will be direct access from Powers Boulevard to Northgate Boulevard. The interchange will be constructed below existing I-25 grade, resulting in cuts into the existing terrain.

New ramps will be constructed for the development of the interchange. The area on the east side of the northbound I-25 pavement will be impacted due to I-25 pavement widening and reconstruction, and construction of the new northbound I-25 to southbound Powers Boulevard ramp. Pavement widening of I-25 will be to the outside of the existing northbound and southbound I-25 lanes to reduce impacts to median habitat.

At northbound I-25 at Monument Branch there are two existing 10 foot by 12 foot CBCs. These structures will be extended on the east end to accommodate the pavement widening in this area.

There are two existing 10 foot by 12 foot CBCs at southbound I-25 at Monument Branch. These structures will be extended on the west end to accommodate pavement widening in this area. There will also be rehabilitation work on the existing wing walls on the east side of the structures.

There is an existing 6 foot by 7 foot CBC at northbound I-25 approximately 1,050 feet north of Monument Branch. This structure will be extended on the east side and will affect habitat.

Smith Creek

Smith Creek is located approximately 900 feet south of Northgate Boulevard. The limits of work in this area include the widening and reconstruction of I-25 and reconstruction and reconfiguration of the existing Northgate Boulevard and I-25 interchange to accommodate the Powers Boulevard connection. Additionally, southbound I-25 will be widened to the outside in this area. The I-25 median area will be impacted on the west side in order to construct the fill slopes for southbound I-25.

The area to the east of the I-25 northbound lanes will also be impacted. These impacts are a result of the new interchange ramps for Northgate Boulevard and Powers Boulevard. The new ramp from northbound Powers Boulevard to the Northgate Boulevard ramp will bisect the existing loop ramp for Northgate Boulevard to northbound I-25. There will also be a new ramp from northbound Powers Boulevard to northbound I-25 that will parallel northbound I-25 and connect to I-25 north of Northgate Boulevard. Finally, there will be a new ramp from northbound-I-25 to Northgate Boulevard.

There are two large CBCs located at Smith Creek under the existing I-25 lanes. These structures will be extended to accommodate the roadway widening in these areas. In addition to the existing CBCs, new CBCs will be constructed to accommodate the stream flows under the new interchange ramps.

Black Forest Tributary

The limits of work in this area are from north of Northgate Boulevard extending north to Black Forest Tributary.

I-25 will be widened from two to three lanes in both directions. The widening of I-25 will occur to the outside of the existing pavement and the existing pavement will be reconstructed (there is no room to widen to the inside). The new construction will occur at the existing I-25 grade (elevation) and location. Additional widening will be required for the Northgate Boulevard ramps to I-25.

There are two existing 10 foot x 10 foot CBCs at Black Forest Tributary. These structures will require significant extensions on both sides.

Baptist Road and Jackson Creek

The limits of work in this area are from north of the Black Forest Tributary to Baptist Road.

I-25 will be widened and reconstructed from two lanes to three lanes in each direction including improved shoulders. The widening will be to the outside of the existing lanes in this area (there is no room to widen to the inside). Baptist Road will be reconstructed to six lanes with raised median and curb, gutter, and sidewalk beyond the roadway edges. The Baptist Road / I-25 interchange will be reconstructed with new ramps. There is an existing two-lane frontage road on the east side of I-25, which will be removed. A new frontage road will be constructed that will intersect Baptist Road at Jackson Creek Parkway. The new frontage road will extend south and connect with the existing frontage road, south of Jackson Creek.

The Jackson Creek floodplain currently crosses both Baptist Road and I-25. The crossing structure at I-25 is a 29 by 18 foot CBC with a natural bottom. This structure will be extended on both sides to accommodate roadway widening in this location. Two 36-inch corrugated metal pipes cross under the existing frontage road to carry water to this structure. There is evidence that the flow from Jackson Creek is currently overtopping the frontage road during significant rainfall events. The frontage road will be removed in this location. There will be channel improvements made to Jackson Creek upstream of the 29 foot by 18 foot CBC. These

improvements will allow for improved habitat conditions and will facilitate wildlife crossing of I-25 in this location.

At the Baptist Road crossing, the roadway will be widened and a new hydraulic structure placed under the road, affecting habitat. FHWA/CDOT are considering a drainage detention structure on the upstream side (north) of Baptist Road to help control the significant erosion problem that has resulted from private development and construction up-gradient of the CDOT conservation area.

Teachout Creek

Teachout Creek crosses I-25 about 5,900 feet north of Baptist Road. The existing crossing is a double 10-foot wide by 10-foot high concrete box culvert that passes under the northbound and southbound roadways and the open median, and has a total length of about 125 feet.

Highway reconstruction in this reach includes additional lanes and shoulders constructed on both the east and west sides, and some minor shoulder widening in the existing median (non-habitat area). The open median will remain. The highway embankment side slopes will also be improved for safety. The existing culvert will be extended about 35 feet to the west and about 40 feet to the east, for a total completed length of about 200 feet.

Construction will be done in two main stages as described before.

North Powers Boulevard

Powers Boulevard has been constructed between Woodmen Road and Research Parkway. Construction of Powers between Research and SH83 is currently underway. Powers Boulevard will ultimately be extended from SH83 north to I-25. The configuration of the new roadway ultimately will be a freeway with grade-separated interchanges. New sections of roadway will be initially constructed as a four-lane expressway with at-grade intersections controlled by stop signs or traffic signals. In the ultimate configuration, interchanges are planned at eight major crossroads. A minimum 210-foot ROW width is required. Where interchanges would be built (which require more land than an at-grade intersection), a ROW "footprint" area was determined that is large enough to contain the entire future interchange.

Powers Boulevard will cross Black Squirrel Creek approximately 0.30 miles north of the proposed interchange with SH83 (Figure 2). The crossing will allow for construction access from both sides of the creek to minimize channel disturbance.

The design includes a multiple bridge structure over Black Squirrel Creek. A 3-span girder bridge design will probably be required and it is estimated that bridge clearance will range from 20 to 70 feet above the stream. Bridge abutments were placed to limit the impacts to habitat. The placement also reduces the height of the fill sections. Currently the south banks of the channel have steep vertical
cuts which will be graded to gentler slopes to facilitate revegetation.

Drainage will be designed in accordance with CDOT standards. The resulting drainage flow volumes that reach the creek will have controlled outlets and will not have a significant impact to the area.

The initial construction will require access from both the north and south ends of the bridge. Access to the south side will be from SH83. Access to the north side will be from the Powers ROW, or easements obtained from the developer. Crane pads and the access road for delivery of the girders will have impacts within riparian habitat. The access road and pads are required for placement of the girders, construction of the piers, and concrete pump trucks.

Shoup Road

SH83 will be realigned from the planned Powers interchange to a point north of the Shoup Road intersection. SH83 reconstruction will include the crossing of Black Squirrel Creek and alterations in the drainage structure at that location (Figure 2).

The existing drainage structure is a 15-foot-diameter metal pipe that may be replaced, or an additional pipe may be constructed parallel to the existing one to accommodate flows under SH83. Drainage will be directed under SH83 using a series of culvert pipes or a single-span bridge to keep the flows in the channel of Black Squirrel Creek instead of topping the roadway.

SH83 crosses Black Squirrel Creek approximately 0.75 miles north of Powers Boulevard. The structure selection is not final, but if the structure is a bridge, it will be a single-span structure that will extend approximately 80 feet across the creek and will accommodate 5 12-foot travel lanes with 10-foot outside shoulders for the SH83 improvements. Minimal impacts to the main channel will be necessary to construct the abutments and fill sections. Additional impacts will occur should the structure include adding pipes or a box culvert structure. El Paso County is planning on routing a recreational trail under SH83 adjacent to Black Squirrel Creek, and the trail will be within the footprint of the bridge or culvert. Trail impacts are not part of this project.

Schedule

Construction schedules are contingent on funding, which is unknown at this time. It is anticipated that construction for all projects will begin in the spring of 2004, and last 4 - 10 years, finishing in 2014. More time however, may be needed.

Conservation Measures

As part of this project, the following conservation measures were proposed in the Biological Assessment to reduce potential for impacts to Preble's:

- Project boundaries will be controlled with chain link or orange plastic fencing to keep heavy equipment within proposed work zones.
- Disturbance areas within hibernation habitat will be cleared of shrubs and other woody vegetation by August 15 to discourage Preble's from hibernating in these areas prior to construction.
- Widening of I-25 will be to the inside (where median areas are non-habitat) when possible to avoid impacts to habitat on road edges.
- Powers Boulevard's crossing over Black Squirrel Creek was located in an area with degraded Preble's habitat.
- Impacts to Black Squirrel Creek at the Shoup Road intersection were shifted to the west side of the road where the habitat is of lesser quality.
- Design for all three projects is currently at approximately 30 percent. Impact minimization efforts will continue through final design phases.
- Smith Creek, Monument Branch, and North and South Black Squirrel Creeks are in close proximity to each other along I-25 south of the Northgate interchange. Preble's may move into the I-25 median from any of these creeks and could even move between the creeks from within the median. Impacts in this area are being minimized by maintaining at least one of these four creeks as a movement corridor at all times, including during construction. Such a movement corridor will either be undisturbed or will be a disturbed area that is fully restored, or has been restored to the extent that animal mobility will not be affected. In the latter case,

artificial cover and other means may be necessary to provide adequate cover for movement. Also in this area, no more than 50 percent of the projected impact area (for all four of these drainages) will be disturbed at any one time.

- Highway construction in habitat areas will be scheduled during Preble's hibernation season (November 1 to April 30).
- Native seed mixes will be used in all revegetation efforts, and the site will be promptly revegetated.
- Noxious weeds will be controlled.
- When practical, construction of minor drainage culverts and other roadway appurtenances will be done from the roadway itself.
- Riprap will be covered with soil and revegetated where possible.
- Maximum slope grades will be used to decrease impacts in habitat areas including the use of guardrail where appropriate.
- In most areas where work on CBCs will be necessary, existing culverts will be lengthened rather than replaced.
- Some culverts under I-25 may have lighting shafts constructed to allow some daylight to enter the culvert.
- Construction access will utilize existing pathways to the extent possible.
- Placement of bridge girders and related work will take place from existing roadway pavement (from above) to the extent possible.
- Mowing along the new highway will be limited to one mower width in most cases, and the remainder of the toe slopes will be left unmowed. Mowing will be consistent with the Memorandum of Understanding between CDOT, CDOW, and the Service. Signage will be provided to delineate mowing limits for CDOT maintenance personnel.
- CDOT and FHWA will continue to explore ways to avoid or minimize impacts to Preble's during the remainder of project development and construction.
- In order to offset the temporary and permanent loss of habitat due to the proposed actions, FHWA/CDOT have devised a four-point program which includes conducting onsite restoration and enhancement actions such as revegetating all temporarily disturbed areas with native plant species; conducting offsite mitigation projects that will promote Preble's recovery in the Monument Creek drainage; monitoring; and research. These measures focus on creating, restoring, or enhancing habitat linkages.

1. Onsite Actions

On-site actions include all steps that will be taken to avoid and minimize impacts, as well as to enhance, restore, and create habitat within or near project areas. Actions to enhance, restore, and create habitat linkages will be given the highest priority. At this time, a minimum of 3.8 acres of habitat will be enhanced, restored, or created at the Pine Creek, Baptist Road, and SH83 locations, including restoration after temporary impacts.

2. Offsite Actions

Off-site actions are conservation measures that will be taken to enhance, restore, or create habitat linkages, as well as the purchase of properties that are needed to create habitat corridors.

A. *Enhance, restore, or create habitat linkages.* FHWA/CDOT have identified five locations where habitat linkages can be restored in northern El Paso County, and are committed to the reestablishment of at least two of these linkages. Details of these and additional options are provided in Appendix D of the Biological Assessment. A summary of the five known options is provided here. Restoring these linkages will lead to improved (or restored) mouse mobility, but may also provide the habitat elements that will allow establishment of a resident population, if the linkage is large enough. The length and condition of the linkage will determine the eventual benefits of restoration or enhancement actions. If expected restoration outcomes are not achieved, corrective measures will be taken and the success of these measures will be monitored.

(i.) The lower Monument Creek to upper Monument Creek linkage would involve the restoration of approximately 1.2 miles of Monument Creek located on private property. A trapping survey has shown that Preble's occurs on adjacent properties, but the subject property is too degraded to support habitat. The site has been grazed for many years and has little to no shrub or grass cover along the creek. Willows are present, but are cropped low by cattle. It is likely that Preble's are also unable to move through the property, and that the populations north and south of the property are separate. Reconnecting Monument Creek through this area would connect the approximately 211 stream miles of lower Monument Creek to the 64 stream miles of upper Monument Creek. The landowner is interested in working with CDOT, and test grazing exclusion plots have been established on the property. This option would also restore the area of the Beaver Creek/Monument Creek confluence.

(ii.) Linking Kettle Creek to Monument Creek across I-25 will involve constructing a land bridge and/or culvert system. Currently, Kettle Creek crosses under I-25 through a siphon pipe approximately ½ mile long and there is a large dam on the upstream (east) side of I-25. Both of these structures prevent mice from moving downstream along Kettle Creek to Monument Creek. A Preble's was observed in the area between the dam and I-25 in 2001. The most likely route the mouse took to this location adjacent to I-25 was over the north side of the dam on the east side of I-25. The creek is occupied on both sides of I-25, and upstream of I-25, Preble's have been found up to 1.5 miles away from I-25. Downstream of I-25, Preble's have been captured to the confluence with Monument Creek. Kettle Creek is one of Monument Creek's longest tributaries. FHWA/CDOT are proposing to construct a "green bridge" over the north side of the dam using existing habitat features such as topography and vegetation to enhance movement, and installing a culvert under I-25, connecting both sides of Kettle Creek. Because I-25 runs through USAFA property at Kettle Creek, any work here
will require USAFA approval. Reconnecting Kettle Creek across I-25 would link approximately 67 stream miles of Kettle Creek to the approximately 211 stream miles of lower Monument Creek.

(iii.) The confluence of Hay and Beaver Creeks is upstream of option 1 above, and this option would involve restoring approximately ½ mile of Monument Creek that is degraded by grazing. Hay Creek flows into Beaver Creek about ¼ mile west of Monument Creek and the Beaver Creek/Monument Creek confluence area has been trapped and Preble's were not found. Preble's have been found upstream on Beaver Creek. Beaver and Hay Creeks contain approximately 34 stream miles.

(iv.) Downstream movement of the Preble's population at FHWA/CDOT's mitigation site on Jackson Creek at I-25 and Baptist Road is inhibited by two small culverts under the frontage road on the east side of I-25, the frontage road, and a large CBC under I-25. The

culverts and the frontage road will be removed, and the CBC improved by installing a natural bottom and
improving habitat at its portals, thereby re-establishing the connection across I-25. Jackson Creek is occupied by Preble's both upstream and downstream of I-25. The confluence of Jackson Creek and Monument Creek is also occupied by Preble's. Jackson Creek contains approximately 10 stream miles though not all of the creek contains good habitat.

(v.) Restore the confluence of Teachout Creek and Monument Creek. This area is on private property just north of and contiguous with option 1 above. Teachout Creek is a small ephemeral drainage that flows through a residential area near the active railroad track, becomes a grazed, grassy swale, then flows into a terminal pond approximately 1/4 mile from Monument Creek; it truly never conflues with Monument Creek. Any Preble's along Teachout Creek are probably isolated from Monument Creek. The area to be restored includes a reach of Monument Creek approximately 1 mile long and varying in width from about 100 to 300 feet. The length of the area to be restored along Teachout Creek is approximately 1/3 mile, and of varying width. Currently, this area is degraded by grazing. There was a Preble's capture in 1997 near the confluence of Teachout and Monument, at a wastewater treatment plant.

B. *Protect, enhance, or restore habitat corridors.* Conservation at the small watershed scale will help to ensure desirable population size, genetic diversity, and protection against catastrophic events and future fragmentation.

FHWA/CDOT have made considerable progress toward reconnecting habitat corridors on two streams in northern El Paso County through preservation and enhancement. Efforts have been focused on Dirty Woman and Jackson Creeks in northern El Paso County (including the area of the confluence of Dirty Woman and Monument Creeks). Both of these streams are occupied by Preble's and support the most important Monument Creek tributary populations north of the USAFA.

Dirty Woman Creek is the location of the I-25/SH105 Monument interchange, where construction began in fall 2002 (Ensight 2000, 2002). CDOT began a program of property and conservation easement purchase in 2000, and much of the known Preble's habitat on this stream is now in permanent protection through CDOT efforts. Conservation easements to date have been used to offset project impacts at the Monument interchange project (DeFelice, Shingledecker, and Lovato easements). CDOT also owns the area between SH105 and I-25, and the area west of I-25 for approximately 0.3 miles. CDOT will continue to pursue the remaining parcels that are needed to complete this corridor, and is committed to habitat protection, enhancement, and restoration, as needed.

CDOT has also purchased a 65-acre conservation property on Jackson Creek east of I-25, to fulfill conservation needs for the Monument interchange and Powers Boulevard projects. This property was scheduled for development before CDOT intervened and purchased it in 2001. Several habitat improvements will occur on this property in the coming years, including conversion of dense cattail stands to shrub islands (scheduled for winter 2003-04), the removal of a frontage road and a long culvert, and improvements to the I-25 culvert structure. CDOT is actively negotiating for additional habitat purchases on the west side of I-25 that will complete this important habitat corridor. CDOT will also purchase either conservation easements or through fee title an additional 50 acres of habitat along Dirty Woman, Monument, Jackson Creeks, or other areas of Preble's habitat. Habitat restoration, enhancement, or creation will be conducted on these lands as appropriate.

C. *Coordinate conservation actions and information with other agencies and landowners.* Recovery can best be achieved through coordinated efforts and CDOT is working closely with El Paso County and the USAFA, and these agencies will likely conduct actions that will contribute towards recovery. The cooperation of developers and private landowners will also be essential for success, and CDOT will share conservation information and cooperate with other such interested parties.

3. Monitoring

The proposed monitoring program will have two major elements: effectiveness monitoring for success standards, and monitoring for special project information.

Effectiveness monitoring determines if the anticipated impacts stated in the Biological Assessment and permitted in the biological opinion are exceeded, and if progress is being made toward the biological goals and objectives of this Biological Assessment. This will generally include a determination of disturbed area (tracked in a project database), and an accounting of revegetation activities. Revegetation monitoring includes management of the revegetation contract, selecting appropriate plant materials, ensuring proper planting techniques, and implementing appropriate BMPs. Revegetation areas are then surveyed following planting until the success standards stated in the site-specific consultation documents are met. These monitoring actions will be reported to the Service in an annual report.

Preble's populations will be monitored at sites where habitat linkages will be created or improved. Although the general value of habitat linkages for the persistence of small populations is recognized, there is relatively little specific scientific information on linkage value to small mammals. Collecting these data would serve to gauge the success of the planned linkages, and provide valuable information for the Preble's Recovery Team. FHWA/CDOT will work with the Service to develop success standards appropriate for selected linkages.

4. Research

CDOT will fund a research project on Preble's use of culverts with small mammal ledges. This work is guided by similar work that was conducted in Montana, where small mammal ledges were shown to enhance movement though culverts (Foresman, 2001). This work would have wide applicability in all areas of the Preble's range. CDOT and FHWA are committed to completing this research and applying the results.

Details of the above conservation measures are outlined in the Biological Assessment.

Proposed Best Management Practices

This section presents the Best Management Practices (BMPs) recommended by CDOT and FHWA to avoid potential impacts to listed species. They are intended to avoid and reduce potential impacts to Preble's populations and habitat. BMPs may be superceded by more stringent or general conditions that are established in project-specific consultation documents. Minimization of adverse effects will be accomplished by implementing the following steps:

1. Each construction project will have an erosion control plan with permanent and temporary measures (BMPs) that will minimize adverse effects to water quality.

2. Identify and prioritize habitat areas that are subject to disturbance. For example, large willow patches or prime hibernation areas shall be avoided if possible. Explore various options with project designers and stretch design flexibility to the greatest extent possible if these discussions result in reduced or avoided site impacts.

3. Vegetation that has to be removed may be salvaged for replanting, or may have other on-site uses (brush piles for mouse cover). Consult with the project biologist.

4. Engineers and construction staff shall consult with the project biologist if there are any changes in plans or if there are any questions regarding proposed activities within Preble's habitat.

5. Limit equipment entrance/exit areas to a single location if possible. Construction access routes shall overlap with permanently disturbed areas to the greatest extent possible.

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4. Engineers and construction staff shall consult with the project biologist if there are any changes in plans or if there are any questions regarding proposed activities within Preble's habitat.

5. Limit equipment entrance/exit areas to a single location if possible. Construction access routes shall overlap with permanently disturbed areas to the greatest extent possible.

6. Minimize Preble's habitat impacts by coordination with equipment operators to find out specifically where they will drive. There are often last-minute changes that can lead to further reduction in site impacts.

7. Minimize impacts to vegetation. This might mean pruning trees rather than tree removals, or cutting shrub stems and allowing sprout re-growth, rather than grubbing out an entire root system.

8. Minimize time periods with bare soil. Vegetation cover is not only beneficial for Preble's but affords the site better resistance to invasion from non-native weeds and reduces erosion.

9. Weed control measures shall be consistent with guidelines established by state, local and federal governments.

10. Installation of chain-link or plastic (orange) fencing to establish no-work zones as early in the project as possible.

11. Schedule project construction and other habitat disturbances during the dormant season if possible. Most plants are more resilient to disturbances when they are dormant than when they are actively growing. This timing also coincides with Preble's hibernation season, and feeding, movement, and reproduction will not be affected.

12. Select native plant species for revegetation, and local varieties if available. All revegetation plans shall be consistent with revegetation and monitoring guidelines established in the pertinent site-specific consultation document.

13. Stockpile soil from disturbed natural areas; it can often be used as a seed bank to re-establish native plant species.

14. The project biologist shall assess the presence of bullfrogs in the project areas, and consider implementing control measures for this introduced species that preys on Preble's meadow jumping mouse.

15. Take precautions in removal of any beaver dams. Beaver dams are likely to improve habitat for jumping mice by creating wider riparian corridors and encouraging willow growth. Prior to removal of any beaver dam, a careful evaluation and assessment of the impact of this action on the entire drainage, especially the effects of flooding and scouring that may result, will
take place.

16. Consider mitigation for altered hydrology due to upstream development. This might include detention basins or channel stabilization actions.

17. Consider impacts to upland habitat. Establish shrubs suitable for day nests and hibernacula, and try to get easements in order to extend buffers where good upland habitat is present.

18. Revegetate exposed sand bars and bank margins as quickly as possible after project completion to minimize erosion.

19. Avoid introduction or excess application of chemicals into aquatic ecosystems. Limit soil stabilizers, sterilants, growth inhibitors, de-icing salts, etc.

20. Prevent spilled fuels, lubricants, or other related materials from entering Preble's habitat.

21. Any project-related construction trash (e.g., cement blocks, asphalt piles, cans, bottles, scrap lumber, etc.) will be removed from habitat areas at project completion.

22. Vehicle traffic in riparian areas will be minimized to the extent practicable.

23. Equipment staging areas in Preble's habitat are prohibited.

24. Use directional drilling/boring if possible when relocating utility lines in all habitat areas.

25. Night-time work will not be allowed in the active season unless specifically permitted in the project-specific consultation document.

Procedure for Changing Future Actions

FHWA/CDOT will notify the Service when proposing any site-specific construction activities by submitting a site-specific Biological Assessment. The Service will review the site-specific Biological Assessment and make a determination whether:

1. the effects of the action described in the site-specific Biological Assessment were sufficiently addressed in this biological opinion;

2. the project description in this biological opinion needs to be amended but there is no change in effects, or;

3. consultation needs to be reinitiated for one of the following reasons:
   a. Incidental take is above the amount identified in this opinion. Incidental take is defined as harm, harassment, pursuit, hunting, shooting, wounding, killing, trapping, capture, or collection of wildlife or removal, damage, or destruction of plants of an endangered species.
   b. Activities are outside of the scope of this biological opinion.

The Service will review the site-specific documents and, if they are complete, respond within 30 days.

Status of the Preble's meadow jumping mouse

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

Records for Preble's meadow jumping mouse define a range including Adams, Arapahoe, Boulder, Denver, Douglas, El Paso, Elbert, Jefferson, Larimer, and Weld counties in Colorado; and Albany, Laramie, Platte, Goshen, and Converse counties in Wyoming (Krutzsch 1954, Compton and Hugie 1993). Armstrong, *et al.* (1997, p. 77) described typical Preble's meadow jumping mouse habitat as "well-developed plains riparian vegetation with relatively undisturbed grassland and a water source in close proximity." Also noted was a preference for "dense herbaceous vegetation consisting of a variety of grasses, forbs and thick shrubs."

Preble's has undergone a decline in range; populations within its remaining range have been lost. Habitat loss and fragmentation resulting from human land uses have adversely impacted Preble's populations. David Armstrong (University of Colorado, pers. com. 1998) concluded that the meadow jumping mouse, in this region as elsewhere, is a habitat specialist, and that its specialized habitat is declining.

Compton and Hugie (1993, 1994) cited human activities that have adversely impacted Preble's meadow jumping mouse including: conversion of grasslands to farms; livestock grazing; water development and management practices; and, residential and commercial development. Shenk (1998) linked potential threats to ecological requirements of Preble's meadow jumping mouse and suggested that factors impacting vegetation composition and structure, riparian hydrology, habitat structure, distribution, geomorphology, and animal community composition must be addressed in any conservation strategy.

Residential and commercial development, accompanied by highway and bridge construction, and instream alterations to implement flood control, directly remove Preble's meadow jumping mouse habitat, or reduce, alter, fragment, and isolate habitat to the point where Preble's meadow jumping mouse can no longer persist. Corn *et al.* (1995) proposed that a 100 meter (328 foot) buffer of unaltered habitat be established to protect the floodplain of Monument Creek from a range of human activities that might adversely affect Preble's or its habitat. Roads, trails, or other linear development through Preble's habitat may act as movement barriers or filters. Shenk (1998) suggested that on a landscape scale, maintenance of acceptable dispersal corridors linking patches of Preble's habitat may be critical to its conservation.

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

Environmental Baseline

Many of the drainages in El Paso County have been trapped and Preble's has been found to occupy portions of Monument Creek, Jackson Creek, Beaver Creek, Lehman's Run, Dirty Woman Creek, Smith Creek, Pine Creek, Cottonwood Creek, Black Squirrel Creek, Kettle Creek, as well as smaller tributaries to these creeks.

Many of the occupied streams have suitable riparian vegetation at their confluences with Monument Creek and for 1 to 3 miles upstream. Most streams affected by the projects have headwaters in the Black Forest east of Monument Creek, where ponderosa pine (*Pinus ponderosa*) is the primary cover type. Although Preble's have been captured in ponderosa pine communities, it is likely that mouse distribution is patchier and densities are lower in these forest types, which do not support the dense understory cover found in riparian communities.

The project areas are within the Monument Creek watershed in El Paso County, itself a part of the larger Arkansas River watershed. All of the drainages within the three project areas are positioned on the south side of the Palmer Divide, a watershed divide that separates the South Platte and Arkansas watersheds. I-25 is located east of Monument Creek, at a distance of 0.8 miles at the northern end, to 0.1 miles at the southern end. Tributaries of Monument Creek include several first-order streams and ephemeral drainages. The smaller drainages in the corridor are barely more than wet swales that support patches of wetland vegetation, and have poorly-defined channel cross-sections. Flow is intermittent during the growing season. Black Forest Tributary and Teachout Creeks typify these conditions.

Moderately sized creeks within the corridor include Monument Branch, Smith, Jackson, and Dirty Woman Creeks. Flow is permanent, but may be reduced to a trickle during the latter part of the growing season. Channel width varies from less than 3 feet to greater than 33 feet, and channel depth is generally moderate (less than 1.5 feet), but may include sections that are more deeply incised. These creeks have floodplains that are usually less than 160 feet wide, but may extend to almost 328 feet.

Cottonwood, Pine, Kettle, and Black Squirrel Creeks are the larger drainages in the project areas. All have well-defined channels that are generally less than 33 feet wide, but can exceed 100 feet in places. Some of the upper stretches of Black Squirrel Creek are primarily dry gulches with upland shrub cover. Most of these creeks also have deeply incised sections, which are probably due to both

naturally erosive soils and increased flow from urbanizing influences in their watersheds. Pine, Cottonwood, and Kettle Creeks all have sections where the channel depth exceeds 66 feet.

Preble's habitat and populations are not distributed continuously on Monument Creek and its tributaries. Estimates of Preble's densities also vary considerably between sites and within sites in different years. Habitat is fragmented by urban, suburban, and commercial development, as well as by agricultural activities, primarily grazing.

Conditions along the I-25 corridor differ from conditions along the proposed Powers Boulevard corridor and at the Shoup Road/SH83 intersection. The I-25 corridor near Pine Creek is commercially developed, and in some places Pine Creek is confined within a concrete channel. A large energy-dissipation structure was constructed on the creek in 1996 at Academy Boulevard. This structure effectively splits Pine Creek's Preble's population. Northward of Pine Creek, the corridor becomes less commercially developed, but housing becomes more common. Drainages are mostly undeveloped along I-25 where it crosses the USAFA. Preble's habitat at Kettle Creek is truncated by a large dam/pipe combination at I-25. The creek is funneled through a siphon approximately 0.5 mile long under I-25 and emerges on the west side of I-25 on USAFA property. The dam and siphon are likely barriers to Preble's movement across I-25, although the creek on both sides of the highway is occupied. Both branches of Black Squirrel Creek are occupied by Preble's on both sides of I-25. At Monument Branch, I-25's northbound and southbound lanes are split by a wide median. This median is occupied by Preble's, as are both sides of the highway. A large housing development to the east of the highway is a potential threat to Preble's in the area. Smith Creek is also occupied on both sides of I-25 and is threatened by housing. Middle Black Forest Creek is also occupied. Jackson Creek is occupied on both sides of I-25 and FHWA/CDOT has purchased 65 acres of Jackson Creek and its floodplain on the east side of I-25 and has plans to enhance Preble's habitat at the site. Development is a potential threat along Jackson Creek on both sides of the highway. The northernmost drainage affected by this project is Teachout Creek which has good Preble's habitat west of I-25, though the east side is developed.

The Powers Boulevard extension alignment is currently undeveloped and is open, native, grazed rangeland. The new corridor is slated for development including residential and commercial development as well as a golf course. The new highway will cross Black Squirrel Creek in an area that is highly eroded and steep, though still occupied by Preble's.

The Shoup Road/SH83 intersection site has well-developed Preble's habitat on the east side where the banks are steep but the floodplain is wide enough to support good habitat. The east side has been trapped and is occupied. The west side however, is highly eroded, has few shrubs, and steep banks. The uplands surrounding the site have been grazed in the past but are currently owned by a developer.

Effects of Action

The proposed projects will affect almost every drainage occupied by Preble's in northern El Paso County. Areas of Preble's habitat affected by the proposed projects include the floodplains as well as adjacent side slopes and uplands. At the time that FHWA/CDOT calculated the action's impacts, critical habitat was proposed by the Service and was defined as those areas within 360 feet of the edge of the stream. Typically however, habitat has been defined as those areas within 300 feet of the 100-year floodplain. Most of the creeks in the project area had reaches that were proposed as critical habitat, but all have been removed from the final designation. Most of the creeks that will be impacted by the proposed action have narrow floodplains and using the critical habitat definition to determine impacts to Preble's habitat is more conservative and results in a higher number of impacted acres than using the typical definition of 300 feet from the 100-year floodplain.

Direct impacts include paving, fill slopes, vehicle access roads, crane pads, mowing along highway rights-of-way, and areas covered by new bridges and culvert extensions. Incidental take of Preble's during both the active and hibernation periods is possible and disturbance of both of those habitat types is assured. Temporary impacts include the temporary loss of both riparian and upland habitat areas during construction and recovery, and alteration of the stream channels during construction.

Indirect impacts include a temporary increase in sedimentation in the affected creeks during construction as well as the potential of an increased amount of road traction substances such as sand and de-icers, into the surface water, due to a wider road surface (and, in the case of Powers Boulevard, a new roadway), and an increase in noise, traffic, and pollutants.

Most of the appropriate habitat in the project areas are likely inhabited by Preble's year-round. The project could directly impact Preble's through temporary or permanent loss of habitats regularly occupied by Preble's. Additional effects of the proposed work include temporary disturbance to potential movement corridors, and increased noise, vibration, and human presence during construction. The majority of work is scheduled to occur during the period when Preble's is hibernating.

A description of site-by-site impacts follows.

I-25

Pine Creek

Habitat along Pine Creek was calculated as 300 feet from the 100-year floodplain on each side of Pine Creek, because it was not proposed as critical habitat. The habitat ends at the 15-foot-wide mowing strip adjacent to the east edge of pavement of the existing highway. The area of permanent impact to the habitat is the area between the east edge of the mowing strip of the existing highway and the east edge of the 15-foot-wide mowing strip next to the new highway. Widening here is estimate to increase the habitat area 0.2 acre (gain of 0.2 acre), because the east edge of pavement of the new highway will be constructed either at the existing edge of pavement or shifted to the west, and a small area that is currently paved will be torn up and revegetated. The remainder of the disturbance area was designated as temporary impact, because it will be revegetated with native plantings and maintained in a natural condition. Temporary impacts are estimated to be 3.3 acres.

Kettle Creek

Habitat was calculated as 300 feet from the 100-year floodplain on each side of Kettle Creek, because this section of the creek was not proposed as critical habitat. The habitat ends on both sides of the existing highway at the 15-foot-wide mowing strip adjacent to the edges of pavement. The area of permanent impact to the habitat is the area between the edges of the mowing strips of the existing highway and the edges of the 15-foot-wide mowing strips next to the new highway. The remainder
of the disturbed habitat will have temporary impacts. Permanent impact at Kettle Creek and I-25 is estimated to reduce the habitat area by 0.1 acre, and there will be approximately 0.4 acre of temporary impact. Kettle Creek currently crosses under I-25 in a 9-foot diameter reinforced concrete pipe that is 2,600 feet long. This crossing design will not change.

Black Squirrel Creek South

Because Black Squirrel Creek was proposed critical habitat, impact was calculated as those affected areas within 360 feet of each side of the creek. The habitat ends on both sides of the existing highway at the 15-foot-wide mowing strip adjacent to the edges of pavement. The area of permanent impact to the habitat is the area between the edges of the mowing strips of the existing highway and the edges of the 15-foot-wide mowing strips next to the new highway. The remainder of the
disturbed habitat will be considered a temporary impact area because it will be revegetated with native plants, and then maintained in a natural condition. The permanent impact at Black Squirrel Creek South will be approximately 1.2 acres. The temporary impact is estimated to be 2.1 acres. I-25 currently crosses over this drainage on 15-foot high bridges. Post-construction, the height will not change but the bridge span will increase from 105 feet to 120 feet.

Black Squirrel Creek North

The total permanent impact area at Black Squirrel Creek North is from pavement and CBC widening and is approximately 1.0 acre, with a temporary impact of approximately 3.1 acres. Portions of this creek were proposed critical habitat and impacts were calculated as those areas within 360 feet of each side of the creek. For those portions that were not proposed critical habitat, impacts were calculated as 300 feet from the 100 year floodplain. The water in this drainage is currently conveyed under I-25 through two 12 x 10 CBCs approximately 210 feet long. These CBCs will increase in length to 235 feet.

Monument Branch

Habitat impacts from the construction of the Powers/I-25 interchange are due to cuts, fills, pavement widening, and reconstruction. Impacts will occur to an unnamed drainage approximately 600 feet north of the edge of Monument Branch on the east side of I-25, and to habitat within the median. The area on the east side of the northbound I-25 pavement will be impacted due to I-25 pavement widening and reconstruction, and construction of the new northbound I-25 to southbound Powers Boulevard ramp. The habitat area in the existing I-25 median will be impacted primarily because of the new northbound Powers Boulevard to southbound I-25 ramp. Pavement widening of I-25 will be to the outside of the existing northbound and southbound I-25 lanes to reduce impacts to median habitat.

Permanent impacts to habitat due to pavement widening, new ramp construction, roadway cuts and fills, and structure widening for the Monument Branch area will affect approximately 3.5 acres. The area of temporary impacts will account for approximately 6.1 acres. There may be an opportunity to enhance the median area of I-25 south to connect to the Monument Branch habitat area as mitigation for the impacts in this area. This will be further evaluated during final design. Portions of this creek were proposed critical habitat and impacts were calculated as those areas within 360 feet of each side of the creek. For those portions that were not proposed critical habitat, impacts were calculated as
300 feet from the 100 year floodplain. There is a median between the northbound and southbound lanes of I-25 where it crosses over Monument Branch. Two 12 x 10 CBCs convey water under each set of lanes and the current culvert length in the northbound direction is 180 feet and the length in the southbound direction is 91 feet. These lengths are projected to increase to 282 and 202 feet, respectively.

Smith Creek

The impacts to habitat are due to I-25 widening and reconstruction and the construction of new ramps for the Northgate Boulevard and I-25 interchange. The habitat area between the Santa Fe Trail and the southbound I-25 lanes will be affected due to construction of new ramps for Northgate Boulevard
to southbound I-25 and from Northgate Boulevard to the southbound I-25 to southbound Powers Boulevard ramps. Additionally, southbound I-25 will be widened to the outside in this area. The I-25 median area will be impacted on the west side in order to construct the fill slopes for southbound I-25.

The permanent impact area due to pavement widening, new ramp construction, roadway cuts and fills, and structure widening for the Smith Creek area is estimated to be 6.2 acres. The temporary impact area is approximately 4.0 acres. The area of the existing loop ramp on the southeast quadrant of the existing Northgate interchange may be a possible location for habitat mitigation. This will be further evaluated during final design. Portions of this creek were proposed critical habitat and impacts were calculated as those areas within 360 feet of each side of the creek. For those portions that were not proposed critical habitat, impacts were calculated as 300 feet from the 100 year floodplain.

Like Monument Branch, there is a median where Smith Creek flows under I-25, and it flows under I-

single culvert 480 feet long under southbound I-25 and the new Northgate and Powers Boulevard ramps. This length is based on conceptual design and grading, and represents the worst-case scenario. FHWA/CDOT will pursue a concept that keeps a portion of Smith Creek approximately 50 – 55 feet in length intact. In this scenario, the culverts under the southbound mainline would be approximately 225 feet long, and the culverts under the ramps would be approximately 145 feet long.

Black Forest Tributary

The permanent impact area due to pavement widening, roadway cuts and fills, and structure widening for the Black Forest Tributary area is approximately 0.3 acres. The temporary impact area is approximately 1.0 acre. Portions of this creek were proposed critical habitat and impacts were calculated as those areas within 360 feet of each side of the creek. For those portions that were not proposed critical habitat, impacts were calculated as 300 feet from the 100 year floodplain. Black Forest Tributary is currently conveyed under I-25 in two 10 x 10 CBCs 142 feet long. These CBCs will be extended to 285 feet.

Baptist Road and Jackson Creek

Permanent habitat impacts due to pavement widening, new roadway construction, roadway cuts and fills, and structure widening for the Jackson Creek area amount to approximately 7.7 acres, and the temporary impact area is estimated to be 4.6 acres. The temporary areas impacted will be re-vegetated after completion of the roadway construction. The area of the existing frontage road that will be removed may then be used for potential habitat mitigation and the area could be enhanced. This created/restored/enhanced habitat area is estimated at 3.6 acres. Portions of this creek were proposed critical habitat and impacts were calculated as those areas within 360 feet of each side of the creek. For those portions that were not proposed critical habitat, impacts were calculated as 300 feet from the 100 year floodplain. The existing 29 x 18-foot natural bottomed CBC under I-25 will be extended from 105 feet to 292 feet.

Teachout Creek

The habitat areas were calculated as 360 feet on each side of Teachout Creek (the proposed critical habitat width). The habitat ends on both sides of the existing highway at the 15-foot-wide mowing strips adjacent to the edges of pavement. The area of permanent impact to the habitat is the area between the edges of the mowing strips of the existing highway and the edges of the 15 feet wide mowing strips next to the new highway, and the area to be covered by the culvert extensions. The permanent impact at Teachout Creek will be approximately 1.1 acres, and the temporary impact approximately 1.4 acres. Portions of this creek were proposed critical habitat and impacts were calculated as those areas within 360 feet of each side of the creek. For those portions that were not proposed critical habitat, impacts were calculated as 300 feet from the 100 year floodplain. Teachout Creek flows under I-25 in two 10 x 10 CBCs that are currently 125 feet long that will be extended to 200 feet in length.

North Powers Boulevard

Temporary impacts due to the construction of Powers Boulevard at Black Squirrel Creek have been minimized. The impact areas were measured within the 360-foot-wide habitat area, measured from the bank of the normal flow channel. The impacts will include the placement of the roadway fill, work area needed for construction, access road and crane pads for placement of the steel girders. The temporary disturbance area is estimated at 6.36 acres.

Permanent impact areas due to the proposed Black Squirrel Creek bridge include the permanent roadway fills within the 360-foot-wide habitat area. In addition, pier and wall structures were tallied as permanent impact areas. The permanent disturbance area is estimated at 2.25 acres. The new bridge will be three spans totaling approximately 400 feet in length.

single culvert 480 feet long under southbound I-25 and the new Northgate and Powers Boulevard ramps. This length is based on conceptual design and grading, and represents the worst-case scenario. FHWA/CDOT will pursue a concept that keeps a portion of Smith Creek approximately 50 – 55 feet in length intact. In this scenario, the culverts under the southbound mainline would be approximately 225 feet long, and the culverts under the ramps would be approximately 145 feet long.

Black Forest Tributary

The permanent impact area due to pavement widening, roadway cuts and fills, and structure widening for the Black Forest Tributary area is approximately 0.3 acres. The temporary impact area is approximately 1.0 acre. Portions of this creek were proposed critical habitat and impacts were calculated as those areas within 360 feet of each side of the creek. For those portions that were not proposed critical habitat, impacts were calculated as 300 feet from the 100 year floodplain. Black Forest Tributary is currently conveyed under I-25 in two 10 x 10 CBCs 142 feet long. These CBCs will be extended to 285 feet.

Baptist Road and Jackson Creek

Permanent habitat impacts due to pavement widening, new roadway construction, roadway cuts and fills, and structure widening for the Jackson Creek area amount to approximately 7.7 acres, and the temporary impact area is estimated to be 4.6 acres. The temporary areas impacted will be re-vegetated after completion of the roadway construction. The area of the existing frontage road that will be removed may then be used for potential habitat mitigation and the area could be enhanced. This created/restored/enhanced habitat area is estimated at 3.6 acres. Portions of this creek were proposed critical habitat and impacts were calculated as those areas within 360 feet of each side of the creek. For those portions that were not proposed critical habitat, impacts were calculated as 300 feet from the 100 year floodplain. The existing 29 x 18-foot natural bottomed CBC under I-25 will be extended from 105 feet to 292 feet.

Teachout Creek

The habitat areas were calculated as 360 feet on each side of Teachout Creek (the proposed critical habitat width). The habitat ends on both sides of the existing highway at the 15-foot-wide mowing strips adjacent to the edges of pavement. The area of permanent impact to the habitat is the area between the edges of the mowing strips of the existing highway and the edges of the 15 feet wide mowing strips next to the new highway, and the area to be covered by the culvert extensions. The permanent impact at Teachout Creek will be approximately 1.1 acres, and the temporary impact approximately 1.4 acres. Portions of this creek were proposed critical habitat and impacts were calculated as those areas within 360 feet of each side of the creek. For those portions that were not proposed critical habitat, impacts were calculated as 300 feet from the 100 year floodplain. Teachout Creek flows under I-25 in two 10 x 10 CBCs that are currently 125 feet long that will be extended to 200 feet in length.

North Powers Boulevard

Temporary impacts due to the construction of Powers Boulevard at Black Squirrel Creek have been minimized. The impact areas were measured within the 360-foot-wide habitat area, measured from the bank of the normal flow channel. The impacts will include the placement of the roadway fill, work area needed for construction, access road and crane pads for placement of the steel girders. The temporary disturbance area is estimated at 6.36 acres.

Permanent impact areas due to the proposed Black Squirrel Creek bridge include the permanent roadway fills within the 360-foot-wide habitat area. In addition, pier and wall structures were tallied as permanent impact areas. The permanent disturbance area is estimated at 2.25 acres. The new bridge will be three spans totaling approximately 400 feet in length.

Shoup Road

Temporary impacts to Black Squirrel Creek due to the reconstruction of the Shoup Road/SH 83 intersection will be minimized to the extent possible. Construction will be accomplished from the existing roadway and will occur west of the existing alignment. Grading and access roads will have a temporary impact to the habitat area. The temporary disturbance area is estimated at 3.84 acres. All temporary impact areas will be revegetated.

Permanent impacts will include the placement of additional roadway fill and pavement, construction of any channel structure, walls and rock riprap. Current roadway, drainage structures and mowed areas next to the existing roadway were subtracted from the totals as an existing impact area. The permanent impact areas due to the proposed roadway and drainage structure improvements were quantified for the area within 360 feet of either side of the channel bank normal flow line. The permanent disturbance area is approximately 2.35 acres. Impacts described here are for the pipe or box structure and may be reduced during the final design once a structure is selected. It is more likely that a 142-foot single span bridge approximately 40 feet high will be constructed. At its lowest point, the height of this bridge is expected to be approximately 32 feet high.

Non-Habitat Areas

Several areas within the corridor were classified in the Biological Assessment as non-habitat. These areas are:

- All highway shoulders along I-25 within 15 feet of pavement (these grassy strips are regularly mowed);
- All paved or dirt roads;
- Most highway medians that clearly did not contain Preble's habitat (the area around Northgate was an exception);
- All currently paved areas within potential habitat;
- The Colorado Springs block exclusion area. This is a 9.34-mile stretch of Monument and Fountain Creeks, beginning in the north from the I-25 crossing of Monument Creek, continuing southward to the Monument/Fountain Creek confluence, and continuing south to the wastewater treatment plant, about one mile south of the Nevada Avenue bridge over Fountain Creek;
- The Cottonwood Creek block exclusion area;
- Areas on North Powers Boulevard, with the exception of the Black Squirrel Creek bridge crossing. These areas were field reviewed by Ensight and the Service on January 21, 2003. There was concern about one potential habitat area on Powers Boulevard about 0.25 miles east of the Voyager Parkway crossing of Monument Branch. Although there was no suitable habitat at the crossing, there was potential habitat just downstream of the project area. Although no impacts are anticipated at this location, FHWA/CDOT will consult with the Service on the status of this area during construction planning if FHWA/CDOT build this section of roadway. If there are future impacts to habitat and they fall within the limited take amount permitted in the biological opinion, no additional conservation measures would be required; and
- An area on Monument Creek just north of the I-25 bridge in Colorado Springs. There will be improvements to the Rockrimmon interchange and frontage road, and this area is just north of the Colorado Springs block exclusion area. This channelized section of Monument Creek is being monitored for Preble's as a condition of the Colorado Springs block clearance. FHWA/CDOT will consult with the Service on the habitat status of this area during construction planning. If there are future impacts to habitat and they fall within the limited take amount permitted in the biological opinion, no additional conservation measures would be required.

The total area of impact as calculated by Ensight is 61.9 acres (Table 1). Temporary impacts account for 36.2 acres, and permanent impacts for 25.7 acres. The majority (86 percent) of the total disturbance will be associated with improvements to existing roadway, through adding highway

lanes, extending culverts and rebuilding existing interchanges. North Powers Boulevard however, is a new roadway. All three projects will result in alteration of Preble's habitat, however, following construction and revegetation, the site should return to functioning Preble's habitat.

Effects to habitat will be primarily due to reduction in habitat areas, but fragmentation will also occur. Fragmentation usually refers to a reduction in habitat areas as well as a reduction in animal mobility between habitat patches. Preble's mobility will be affected to some extent by lengthening of culverts under I-25, but this effect is expected to be temporary, and last only during construction and habitat recovery. It is anticipated that culvert lengths will not exceed 300 feet, which is close to the maximum known distance that Preble's have dispersed through a culvert (305 feet at Dirty Woman Creek) (Table 2). As Table 2 shows, of the fourteen drainage crossings affected, nine are CBCs that will be lengthened anywhere from 25 – 350 feet; six of the crossings will be more than 100 feet longer after construction than they currently are. These numbers are based on the worst-case scenario for Smith Creek as described above, where a single crossing of 480 feet will be used under the southbound lanes of I-25 and the new Powers Boulevard/Northgate ramps. In the more likely scenario, there will be a new 140-foot long CBC installed at Smith Creek for the new ramps, and a separate 225-foot long crossing for southbound I-25, leaving approximately 55 feet of Smith Creek between the mainline and the new ramps. The I-25 crossing of Kettle Creek will not change, and the new Powers Boulevard crossing of Black Squirrel Creek will be a span bridge ranging from 20 –70 feet high which should not present a barrier to wildlife movement. One crossing, Black Squirrel Creek at Shoup Road, is currently a CBC that will be replaced with a span bridge a minimum of 32 feet high, making the road more permeable to wildlife at that location. Mobility will also be better than it currently is at Jackson Creek because of habitat improvements and removal of the frontage road and the culverts beneath it.

Small mammal ledges may be used in new culverts to enhance mouse mobility pending research results. Although longer culverts may affect Preble's dispersal under road surfaces, dispersal should not be affected to the point where movement is impossible, with subsequent isolation of populations. All project areas should allow for dispersal rates that support both genetic mixing and maintenance of current population sizes. Post-project dispersal rates should be comparable to pre-project dispersal rates, or in some cases, better. Pre- and post-project monitoring will be conducted at some sites.

Project impacts will cause a loss of habitat area. There will be a permanent loss of approximately 25.7 acres from the three projects, and approximately 36.20 acres of temporary loss. Some of these areas include breeding, feeding, nesting, and potential hibernation habitat. The majority of habitat impact (86 percent) will occur adjacent to existing roads, in areas not considered high quality habitat. The new Powers Boulevard project, with approximately 8.61 acres of disturbance, will include disturbances to poor quality riparian habitat, within a severely downcut stream channel.

Impacts at the three project areas will not occur simultaneously, allowing for some habitat and Preble's population recovery between impacts. In addition, efforts to reconnect corridors through land purchase and habitat improvement are ongoing, and some of these efforts will be complete and successful prior to project impacts, thus reducing the effects of the projects to Preble's on a landscape scale. The construction and habitat protection schedules combined should help protect populations throughout the project areas from the effects of natural stochastic events, such as flood, fire, or drought because habitat and populations should have time to recover in some areas before they are affected in others.

Most work will be done during the hibernation period and hibernating Preble's individuals could be directly killed during construction by being crushed by construction equipment, or through increased exposure to predators or the elements due to lack of cover. Preble's behavior will also be affected during project construction. Areas where vegetation has been cleared but not yet recovered, could deter dispersal of breeding individuals or of young. Clearing may also reduce hibernation habitat. Silt fences could also have the effect of preventing mice from moving through or to areas that otherwise would be accessible. Lack of escape cover and the presence of silt fencing could also increase Preble's susceptibility to predation. Such effects are difficult to quantify, but were

Table 1. Summary of Impacts by Site.

Site	Permanent Impact (acres)	Temporary Impact (acres)	Activities
Pine Creek	0.0 (0.2 recovered)	3.3	New lane, east side of I-25, minor drainage culverts, construction access.
Kettle Creek	0.1	0.4	New lanes both sides, construction access.
Black Squirrel Creek South	1.2	2.1	New lanes both sides, new multi-span bridges to replace two existing bridges, construction access.
Black Squirrel Creek North	1.0	3.1	New lanes both sides, extend existing side-by-side CBCs, construction access.
Monument Branch	3.5	6.1	New lanes both sides, auxiliary lanes for Powers, extension of separate culverts on east and west sides of I-25, and on east side of I-25 north of Monument Branch, construction access.
Smith Creek	6.2	4.0	New lanes both sides, new ramps, extend existing side-by-side CBCs on east and west sides of I-25, new CBCs under new ramps, detention pond in median, construction access.
Black Forest Tributary	0.3	1.0	New lanes both sides, extend existing side-by-side CBCs on east and west sides of I-25, construction access.
Jackson Creek and Baptist Road	7.7 (up to 3.6 recovered)	4.6	New lanes both sides of I-25, extend existing CBC. Baptist Road will be widened to six lanes with a new culvert at Jackson Creek. Existing frontage road will be eliminated, replaced by new Jackson Creek Parkway on east side of the 65-acre CDOT property.
Teachout Creek	1.1	1.4	Additional lanes, lengthen CBC.

Table 1. Summary of Impacts by Site.

Site	Permanent Impact (acres)	Temporary Impact (acres)	Activities
Pine Creek	0.0 (0.2 recovered)	3.3	New lane, east side of I-25, minor drainage culverts, construction access.
Kettle Creek	0.1	0.4	New lanes both sides, construction access.
Black Squirrel Creek South	1.2	2.1	New lanes both sides, new multi-span bridges to replace two existing bridges, construction access.
Black Squirrel Creek North	1.0	3.1	New lanes both sides, extend existing side-by-side CBCs, construction access.
Monument Branch	3.5	6.1	New lanes both sides, auxiliary lanes for Powers, extension of separate culverts on east and west sides of I-25, and on east side of I-25 north of Monument Branch, construction access.
Smith Creek	6.2	4.0	New lanes both sides, new ramps, extend existing side-by-side CBCs on east and west sides of I-25, new CBCs under new ramps, detention pond in median, construction access.
Black Forest Tributary	0.3	1.0	New lanes both sides, extend existing side-by-side CBCs on east and west sides of I-25, construction access.
Jackson Creek and Baptist Road	7.7 (up to 3.6 recovered)	4.6	New lanes both sides of I-25, extend existing CBC. Baptist Road will be widened to six lanes with a new culvert at Jackson Creek. Existing frontage road will be eliminated, replaced by new Jackson Creek Parkway on east side of the 65-acre CDOT property.
Teachout Creek	1.1	1.4	Additional lanes, lengthen CBC.

Site	Permanent Impact (acres)	Temporary Impact (acres)	Activities
Powers Boulevard North	2.25	6.36	New highway over Black Squirrel Creek with multiple bridge structures, disturbed uplands, construction access.
Shoup Road/SH83	2.35	3.84	Relocation and widening of SH83, new culvert or bridge, construction access.
TOTALS	**25.70**	**36.20**	

BMPs such as leaving brush piles in areas where vegetation has been removed to provide thermal and escape cover while habitat recovers, controlling vehicle access, minimizing time periods and areas with bare soil, doing the majority of work during the hibernation period, or clearing disturbance areas within hibernation habitat of shrubs and other woody vegetation prior to the hibernation period to discourage hibernation (and thus decrease the chance of potentially killing a hibernating mouse).

Although the projects will result in alteration and loss of habitat, given the proposed conservation measures, the projects should not cause permanent habitat fragmentation and loss of connectivity within and between populations in the project areas. Habitat connectivity and mouse mobility could improve at the project sites where culvert and bridge designs are improved, and where actions designed to remove obstacles to movement are implemented. One culvert will be replaced with a bridge which will improve permeability, but most culverts will be lengthened anywhere from 25 feet to 350 feet. Most of the project actions will occur within habitat that supports low density Preble's populations. The nature of the impacts and subsequent restoration actions will allow for recovery of populations in project areas.

Based on the amount and nature of project impacts, the project will have temporary but not significant long term effects on the ability of Preble's to travel upstream or downstream along the riparian corridors within the project areas, or on the creeks' hydrologic regimes, including their ability to support riparian vegetation. Given the conservation measures proposed, over time temporarily disturbed Preble's habitat should return to a condition as good as that which is currently present. Monitoring and success standards described in the project-specific consultation documents as well as in the Terms and Conditions below, will assure that the temporarily impacts areas are maintained as good habitat.

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.

El Paso County is one of the fastest growing counties in the nation with substantial residential, urban and commercial development occurring. According to the Biological Assessment, in 2000, the county's population was approximately 517,000, but that number is expected to increase to 746,000 by 2025. It is very likely that Preble's upland and riparian habitats will be affected by this development. Such changes in land use could have potential direct or secondary impacts on Preble's and its habitat in the area. Secondary effects include an increase in impervious surfaces and subsequent changes in the hydrology of Monument Creek and its tributaries potentially leading to

Table 2. Comparison of Existing and New Crossings at All Sites

Crossing	Crossing type	Current length	Post-construction type	Post-construction length
Kettle Creek	9-foot Reinforced Concrete pipe	2600 feet	Existing 9-foot RCP	Same as existing
Black Squirrel Creek South	15-foot high bridges	105-foot spans	15-foot high new bridges	120-foot spans
Black Squirrel Creek North	2 12 x 10-foot Concrete Box Culvert (CBC)	210 feet	2 12 x 10 foot CBC extension	235 feet
Monument Branch	2 21 x 10-foot CBC in each direction	180 feet northbound	extension	282 feet
		91 feet southbound	extension	202 feet
N of Monument Branch	6 x 7-foot CBC northbound only	78 feet	2 10x6-foot CBC northbound only	130 feet
Smith Creek (worst-case scenario)	2 10 x 10-foot CBC northbound	114 ft northbound	extension northbound	250 feet northbound
	2 10 x 10-foot CBC southbound	130 ft southbound	extension southbound	480 feet southbound
Smith Creek (most likely scenario)	2 10 x 10-foot CBC northbound	114 ft northbound	extension northbound	250 feet northbound
	2 10 x 10-foot CBC southbound	130 ft southbound	extension southbound 2 10x10-foot CBCs for new ramps	225 feet southbound 145 feet
Black Forest Tributary	2 10 x 10-foot CBC	142 feet	extension	285 feet
I-25 at Jackson Creek	29x18-foot CBC natural bottom	105 feet	extension	292 feet
Baptist Road at Jackson Creek	48-inch corrugated metal pipe	50 feet	will be removed	
Teachout Creek	double 10x10-foot CBC	125 feet	extension	200 feet
Black Squirrel Creek at Powers Boulevard	none	none	3 span bridge 20-70 feet high	400 feet
Black Squirrel Creek at Shoup Road	15-foot diameter pipe	130 ft	single span 32-40 feet high	142 feet

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El Paso County is currently working on a county-wide Habitat Conservation Plan (HCP) in cooperation with the Service. This plan will address growth and other activities within the county.

Conclusion

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 opinion that neither the direct nor indirect effects of the proposed action (which includes the implementation of conservation measures agreed to during informal consultation and outlined in this biological opinion) nor the cumulative effects will jeopardize the continued existence of Preble's. A Panel of Preble's experts convened by FHWA/CDOT to discuss impacts due to reconstruction of I-25 and related conservation measures met three times during 2000. A report that identified and prioritized concerns was compiled and submitted to the Service in 2001. That report identified isolation of small populations as the greatest threat to long-term persistence of Preble's in the Monument Creek watershed. The Panel also identified general biological goals for maintaining a viable mouse population in the corridor. The top three goals are: 1) keep tributary populations whole; 2) maintain upland habitat, and; 3) maintain connectivity between populations. Through their conservation measures, FHWA/CDOT will be addressing the first and third goals by re-establishing at least two severed populations, as already discussed. They will also be maintaining connectivity along onsite drainages through habitat restoration activities. These activities are likely to improve connectivity in El Paso County, thereby increasing Preble's population sizes on some drainages, thus supporting recovery goals.

Although the project will adversely affect Preble's and its habitat in the Monument Creek drainage in the short term, the proposed action and conservation measures will avoid the likelihood of jeopardy to the species. In the long term, habitat linkages in some drainages will be greatly improved,
maintained, and protected. Critical habitat was not designated in the project area, therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of 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 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 habitat.

2. Minimization of impacts to Preble's habitat through implementation of BMPs and further refinement of project design.

3. Implementation of Conservation Program including onsite actions, offsite actions, monitoring and research commitments.

The measures described below are non-discretionary, and must be undertaken by the FHWA so that they become binding conditions of any project approval issued to CDOT for the exemption in section 7(o)(2) to apply. The FHWA has the continuing duty to regulate the activity covered by this incidental take statement. If the FHWA fails (1) to assume and implement the terms and conditions or (2) fails to require CDOT to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the project approval, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, CDOT must report the progress of the action or its impact on the species to the Service as specified in the incidental take statement.

This biological opinion allows for take of listed species. Site-specific consultations will allow for refinement of take when specific information on project design, timing, and amount of take anticipated are known.

Amount or Extent of Incidental Take

The Service anticipates incidental take of Preble's through direct killing will be difficult to detect due to their small size. However, the Service believes that the level of take can be anticipated by loss of food and cover, movement and dispersal corridors, and other essential habitat elements. The Service anticipates that the proposed action will result in incidental take of an undetermined number of Preble's through permanent and temporary loss of approximately 61.9 acres of Preble's habitat. Habitat in the project area is inhabited by Preble's year-round.

Incidental take may also occur through secondary impacts to Preble's and its habitat. Along the I-25 corridor and at the Shoup Road/SH83 intersection site, this take is not expected to be significant because the roads have impacted the area for many years, and only insignificant additional secondary threats to Preble's will be introduced through the completion of the projects. Powers Boulevard however, is a new roadway that will traverse areas previously impacted primarily only by grazing. The corridor has been slated for development for many years, and this development will introduce new threats to Preble's and their habitat including increased impervious surfaces, increase in road traction substances, noise, vibration, weeds, predators, and competitors. The project areas are occupied by Preble's and are also likely used as travel or dispersal corridors. Conservation measures will minimize take.

Effect of the Take

In this biological opinion, the Service determined that the level of anticipated take is not likely to result in jeopardy to the species. No critical habitat has been designated in the project area, therefore none will be affected.

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 that 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, including reestablished linkages, are maintained into perpetuity as Preble's habitat. 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.

7.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. These terms and conditions are non-discretionary.

1. The following terms and conditions implement reasonable and prudent measure number 1. Work will be supervised, inspected, and monitored 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.

4.The following terms and conditions implement reasonable and prudent measure number 3. FHWA and CDOT will purchase Preble's habitat or will enter into agreements with private 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 commitments to reestablish at least two linkages, and to secure at least an additional 50 acres of Preble's habitat in the project area, 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 6.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 terms and conditions implement 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 (dead, injured, or hibernating) is located during construction, the Colorado Field Office of the Service (303) 275-2370 or the Service's Law Enforcement Office (303) 274-3560 will be contacted immediately.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take (61.9 acres of Preble's habitat) is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

Reporting Requirements

CDOT will maintain a database that will include project information for activities that are covered in the Biological Assessment. In addition, FHWA/CDOT will deliver an annual report to the Service that documents the status of all activities covered in the Biological Assessment.

If an emergency occurs within project area habitat, CDOT will notify the Service immediately and determine and implement actions that will correct the situation and minimize any necessary additional impacts. CDOT will submit a report to the Service describing any actions taken, additional impacts
(if any), and an updated project database report, if applicable.

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 affects of a proposed action on listed species or critical habitat, to help implement recovery plans, or
to develop information.

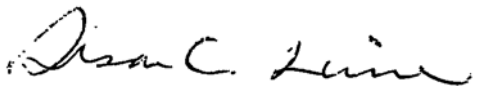
The Service has no conservation recommendations at this time relating to the proposed project.

REINITIATION NOTICE

This concludes formal consultation and conference on proposed Federal actions related to the proposed highway improvements. As required by 50 CFR 402.16, reinitiation of formal consultation is required if (1) the amount or extent of incidental take is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion, (3) the agency action is subsequently modified in a manner that causes an adverse effect to the listed species or critical habitat that was not considered in this opinion, (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where incidental take exceeds the authorized, any operations causing such take must cease pending reinitiation. In addition, if any of the Terms and Conditions are not met, reinitiation of formal consultation will become necessary.

If the Service can be of further assistance, please contact Alison Deans Michael of my staff at (303) 275-2370.

Sincerely,



Susan C. Linner
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Ref:Alison/CDOT2003/Reg2

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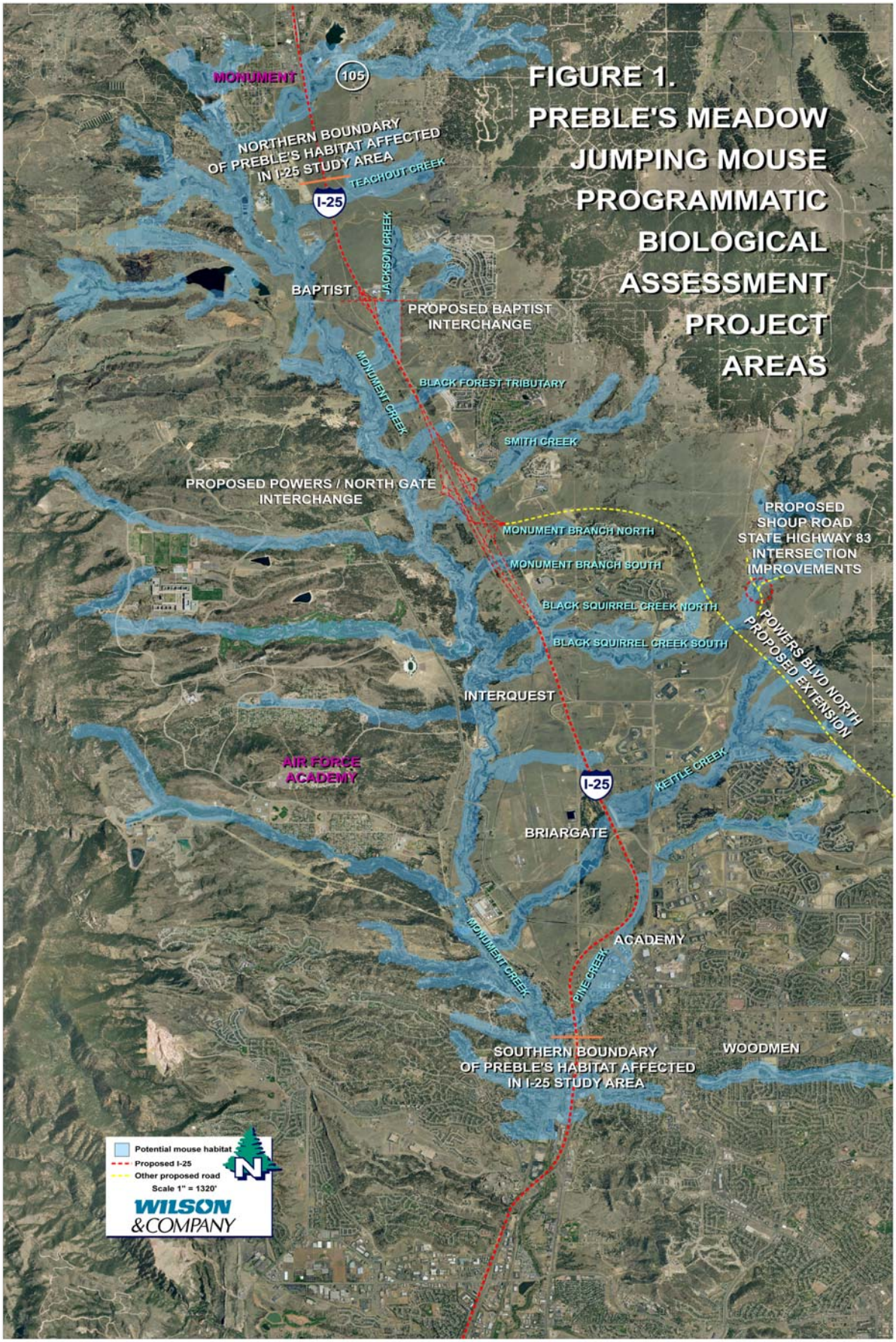
FIGURE 1.
PREBLE'S MEADOW JUMPING MOUSE PROGRAMMATIC BIOLOGICAL ASSESSMENT PROJECT AREAS
MONUMENT
105
NORTHERN BOUNDARY OF PREBLE'S HABITAT AFFECTED IN I-25 STUDY AREA
TEACHOUT CREEK
I-25
JACKSON CREEK
BAPTIST
PROPOSED BAPTIST INTERCHANGE
MONUMENT CREEK
BLACK FOREST TRIBUTARY
SMITH CREEK
PROPOSED POWERS / NORTH GATE INTERCHANGE
MONUMENT BRANCH NORTH
MONUMENT BRANCH SOUTH
BLACK SQUIRREL CREEK NORTH
BLACK SQUIRREL CREEK SOUTH
PROPOSED SHOUP ROAD STATE HIGHWAY 83 INTERSECTION IMPROVEMENTS
POWERS BLVD NORTH PROPOSED EXTENSION
INTERQUEST
AIR FORCE ACADEMY
I-25
KETTLE CREEK
BRIARGATE
MONUMENT CREEK
ACADEMY
PINE CREEK
SOUTHERN BOUNDARY OF PREBLE'S HABITAT AFFECTED IN I-25 STUDY AREA
WOODMEN
Potential mouse habitat
Proposed I-25
Other proposed road
Scale 1" = 1320'
WILSON &COMPANY