

Biological Assessment
South Wadsworth Boulevard/Waterton Road
Intersection
Jefferson County, Colorado

Prepared For:
Colorado Department of Transportation



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Introduction

Jefferson County (JeffCo), Douglas County, and Lockheed Martin Corporation, Inc. (Lockheed Martin) (Project Team), in cooperation with the Colorado Department of Transportation (CDOT) and Federal Highway Administration (FHWA), are evaluating improvements to the South Wadsworth/Waterton Road intersection to address the transportation problems in the area of this critical intersection. The purpose of this biological assessment is to review the proposed project in sufficient detail to determine to what extent the proposed action may affect any of the threatened, endangered, proposed, or sensitive species listed below. This biological assessment is prepared in accordance with legal requirements set forth under Section 7 of the Endangered Species Act (ESA) (16 U.S.C. 1536 (c)), and follows the standards established in CDOT's National Environmental Policy Act (NEPA) guidance and ESA guidance. The lead federal agency for the project is the Federal Highway Administration (FHA).

The species considered in this document are:

Threatened, Endangered, Proposed Threatened or Proposed Endangered Species:

- Preble's meadow jumping mouse (*Zapus hudsonius preblei*)- Threatened

Critical Habitat

The action addressed within this biological assessment does not fall within critical habitat for the Preble's meadow jumping mouse (PMJM). The U.S. Fish and Wildlife Service (USFWS) has designated critical habitat for the PMJM along the South Platte River upstream of Chatfield Reservoir (USFWS 2009). The Study Area is immediately adjacent to, but falls outside of, designated critical habitat for PMJM.

Consultation to Date

The project team initiated informal consultation with (USFWS) in Spring 2009. Data obtained from the USFWS, CDOW, and CNHP were compiled to identify threatened and endangered species that potentially exist in the Study Area. Meetings were held with USFWS and CDOT on June 22, 2010 to discuss PMJM habitat within the Study Area and the need for clarification of habitat limits. Habitat for PMJM generally includes streams and the 100-year floodplain, and an additional 300 feet to account for suitable upland habitat that is used by PMJM for forage. Although much of the Study Area is located within the 100-year floodplain of the South Platte River, much of the land has been disturbed and is now dominated by Wadsworth Boulevard and Waterton Road right-of-way, and parking lots for the Audubon center and the Waterton Canyon recreation area. For that reason, it was determined that the limits of suitable PMJM habitat be clarified and approved by USFWS. Field meetings with USFWS were held on July 1, 2010 to verify limits of viable PMJM habitat within the Study Area. Since then, the project team has had several informal conversations with USFWS representatives to clarify mitigation and other requirements.

Description of the Preferred Alternative

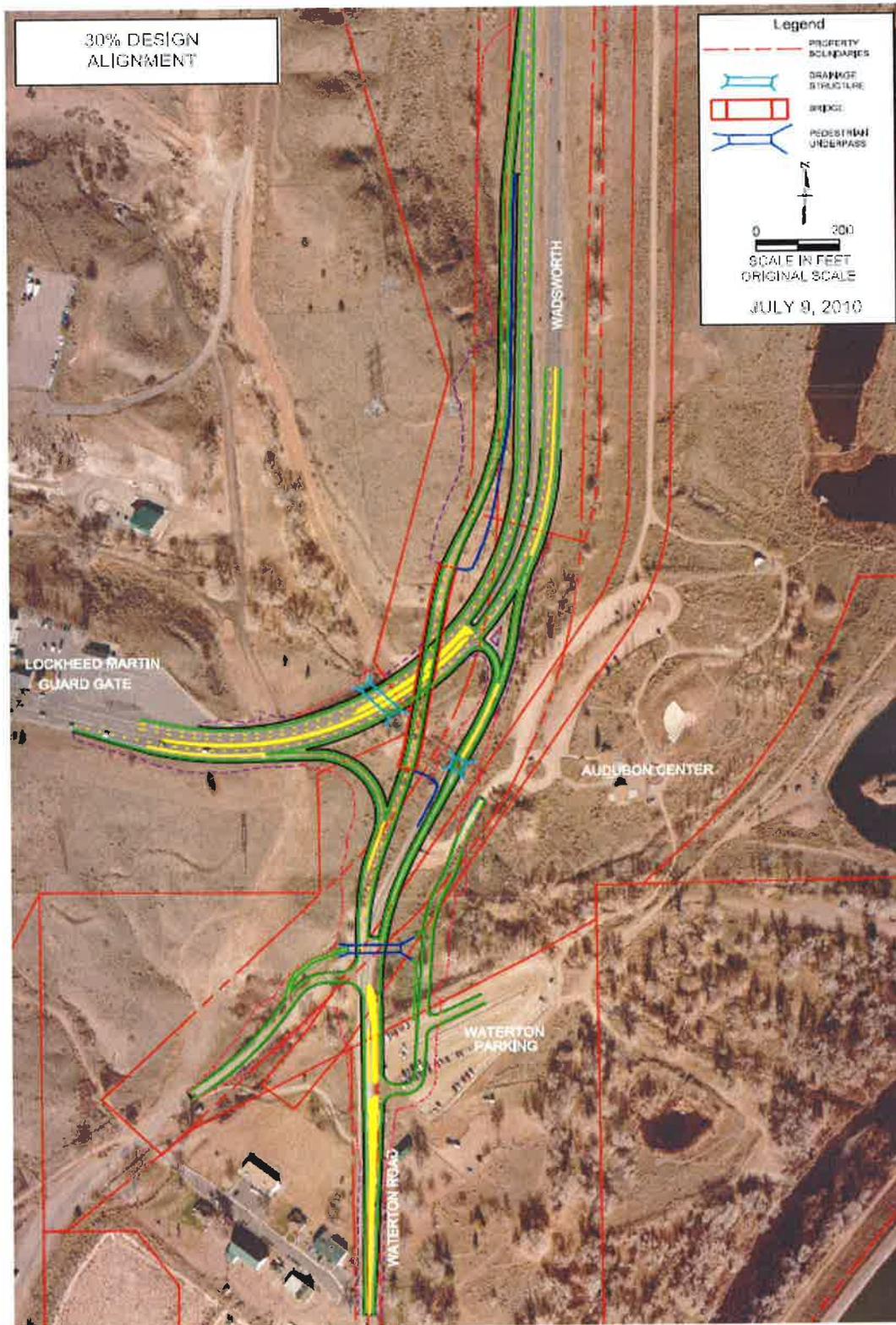
The Preferred Alternative would provide a grade-separation at the existing intersection. It would include some minor widening on existing South Wadsworth Boulevard from Lockheed Martin to the north. Northbound Waterton Road traffic would continue to use the existing roadway alignment and would have a long acceleration and merge lane onto northbound South Wadsworth Boulevard. A separate left turn lane and protected (barrier separated) acceleration lane would be provided for the northbound Waterton Road onto southbound South Wadsworth Boulevard movement into Lockheed Martin. Southbound traffic on South Wadsworth Boulevard to Waterton Road would exit one-third mile north of the current intersection, and continue on a flyover ramp over South Wadsworth Boulevard. Traffic exiting Lockheed Martin wishing to go south on Waterton Road will merge onto the descending raised portion of the flyover which will be separated from the northbound Waterton traffic by an eighteen-foot median and continue until they merge just north of the Platte Canyon/Denver Water access road (see **Figure 1**).

The Preferred Alternative would combine the separate entrances for the Waterton parking lot and the Audubon Nature Center into one intersection with a new access road constructed on Denver Water, Jefferson County, and United States Army Corps of Engineers (USACE) property that connects those two parking lots. A median deceleration lane would be provided for southbound Waterton Road to separate left turns from through traffic at this access. The Preferred Alternative also includes a pedestrian underpass north of the Waterton parking lot to improve safety for Waterton Canyon/Colorado Trail users and visitors to the Kassler Center and Denver Water property amenities.

The Preferred Alternative best addresses safety for the two turning movements that currently cause congestion. First, it would eliminate the movement requiring traffic to turn left from southbound South Wadsworth Boulevard to Waterton Road by providing that movement via the new flyover ramp. Second, the Preferred Alternative improves the left-turn movement from northbound Waterton Road into Lockheed Martin by removing the southbound Wadsworth to Waterton traffic from the mix and providing a protected acceleration lane on Southbound Wadsworth for those making the left turn from Waterton towards the Lockheed Martin entrance.

In summary, the Preferred Alternative would effectively address all elements of the project Purpose and Need, meet project goals, and would provide the best short-term and long-term solution to achieve Jefferson and Douglas counties' long-term vision for the corridor.

Figure 1: Preferred Alternative



Project Area and Setting

The South Wadsworth/Waterton Road intersection project study area (Study Area) is located in Jefferson County, Colorado in the southwestern metropolitan Denver area. The Study Area extends approximately 300 feet north of the South Platte River, through the intersection with South Wadsworth Boulevard and continues up Wadsworth for another 1,800 ft. Adjacent to the corridor on the east side of the roadway the Study Area includes Denver Water property and the Audubon Center/Discovery Pavilion and on the west side extends along the roadway leading to the Lockheed Martin guard station (see **Figure 2**).

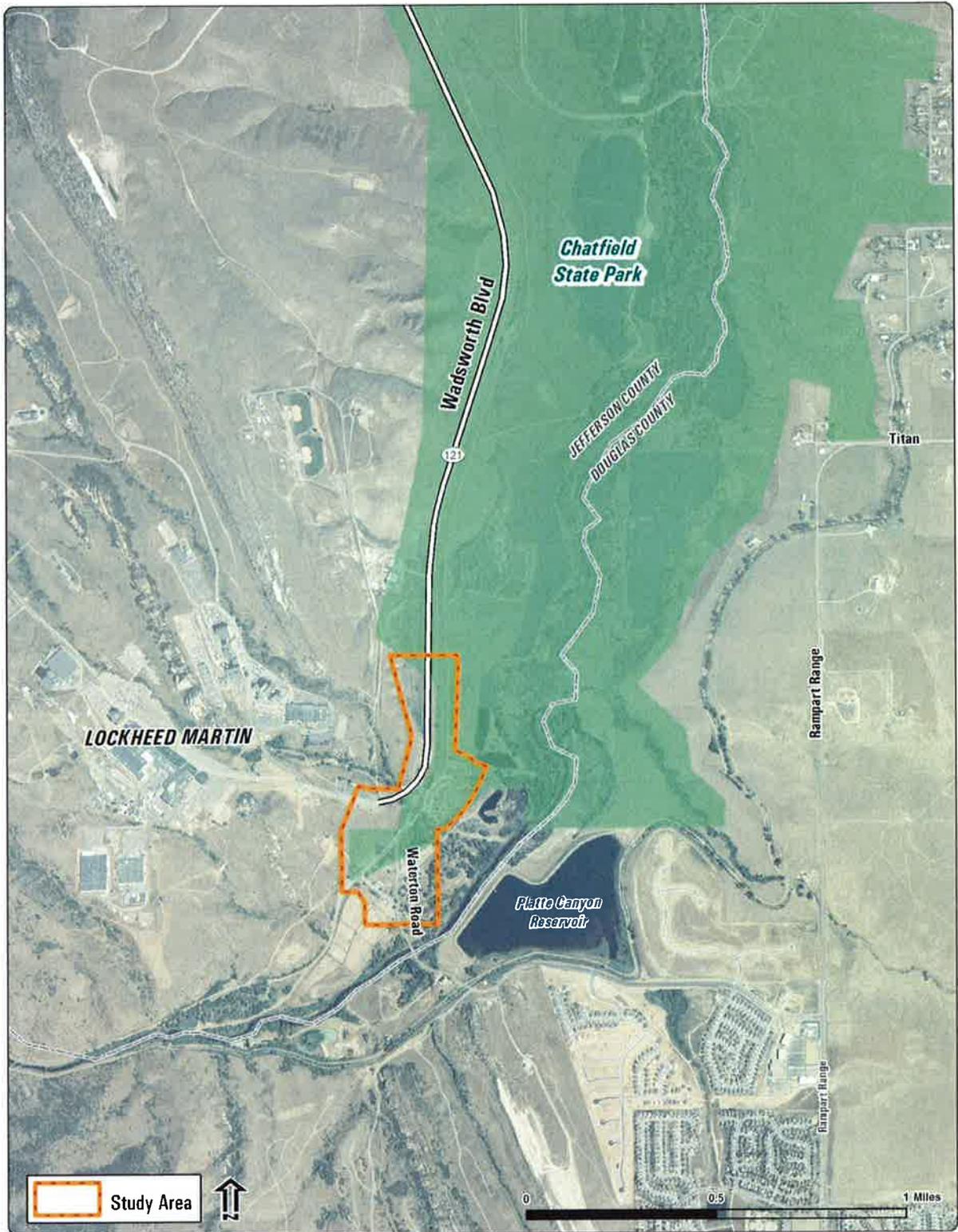
Wadsworth Boulevard is a four-lane state highway (also known as CO 121) that runs north-south through Jefferson County, from the Broomfield County Line in the north to the Waterton Road intersection just north of the Douglas County line. South Wadsworth Boulevard tapers to two lanes near its intersection with Waterton Road, with a turn lane to accommodate left-turn movements onto Waterton Road. Past the intersection, South Wadsworth Boulevard turns westward and, after approximately another 1,000 feet, reaches the Lockheed Martin Campus entrance station, where it becomes a private road used only by Lockheed Martin employees and guests.

Waterton Road is a two-lane road that begins at the intersection with South Wadsworth Boulevard and extends south across the South Platte River into Douglas County. It then turns eastward and extends approximately one mile to its terminus at Rampart Range Road.

The land surrounding the intersection and within the Study Area is primarily open and publicly accessible. It includes USACE land associated with Chatfield Reservoir, and Denver Water property. The Denver Water property includes the former Kassler Water Plant (now called the Kassler Center), which is subleased by the Thorne Ecological Institute for environmental education programs.

The Denver Parks and Recreation Department leases 750 acres of the USACE property located west of South Wadsworth Boulevard for the Denver Botanic Gardens at Chatfield State Park. The Colorado State Department of Natural Resources, State Parks Division leases 5,378 acres located on the east side of South Wadsworth Boulevard for Chatfield State Park. The Audubon Society of Greater Denver (ASGD) subleases a portion of land within Chatfield State Park directly adjacent to the South Wadsworth Boulevard/Waterton Road intersection. The remaining land in the Study Area is privately owned, most of which is owned by Lockheed Martin.

Figure 2: Vicinity Map



Environmental Baseline

Affected Environment

The Environmental Protection Agency (EPA) has categorized habitat types across the state as a way to generalize resource types, vegetation communities, land uses, and wildlife species distributions. The Study Area is located at the edge of two sub-ecoregions: sub-ecoregion 21d (Foothill Shrublands) and sub-ecoregion 25l (Front Range Fans), as defined by EPA. Foothill Shrublands are typically dominated by sagebrush and mountain mahogany shrublands, pinyon-juniper woodlands, scattered scrub-oak shrublands, and grasslands. Front Range Fans are typified by grasslands, but have been converted mostly to rangeland, croplands, and developed areas.

Along with the generalized vegetation communities described above, riparian vegetation exists along Brush Creek, the historic Last Chance Ditch, and parts of the South Platte River corridor. For the purposes of this study, natural vegetation communities within the Study Area can be generalized into two categories: grassland/scrubland and riparian.

Table 1 shows the common vegetation identified in the Study Area during the July 2009 survey.

The Study Area is dominated by the rights-of-way for South Wadsworth Boulevard and Waterton Road, the parking lots for the Audubon Nature Center and Waterton Canyon/Colorado trails, and several hiking trails. Areas adjacent to the roadway are infested by several noxious weed species

Table 1: Common Vegetation within the Study Area

Common Name	Scientific Name
Blue grama	<i>Bouteloua gracilis</i>
Boxelder	<i>Acer negundo</i>
Buffalograss	<i>Buchloe dactyloides</i>
Chokecherry	<i>Prunus virginiana</i>
Golden currant	<i>Ribes aureum</i>
Green ash	<i>Fraxinus pennsylvanica</i>
Narrowleaf cottonwood	<i>Populus angustifolia</i>
Peachleaf willow	<i>Salix amygdaloides</i>
Plains cottonwood	<i>Populus deltoides</i>
Redtwig dogwood	<i>Cornus stolonifera</i>
Sandbar willow	<i>Salix exigua</i>
Siberian elm	<i>Ulmus pumila</i>
Sideoats grama	<i>Bouteloua curtipendula</i>
Snowberry	<i>Symphoricarpos occidentalis</i>
Western wheatgrass	<i>Pascopyrum smithii</i>
Wild plum	<i>Prunus americana</i>

Federally Proposed and Listed Species and Designated Critical Habitat

Methods

All federally listed threatened, endangered and candidate species potentially occurring in the project area were identified. These species were based both on the FWS Region 6 list, which identifies listed species at the county level, and consultation with FWS biologists. Using this list, literature reviews were used to identify the species potentially occurring in the project area. Each species' habitat requirements, seasonal use patterns, ranges and distributions were also considered.

Pedestrian field surveys for both general wildlife and federally listed wildlife species were conducted during summer 2009. These surveys were performed in an effort to locate and identify

potential habitat for the species considered. These surveys focused on areas that would be disturbed by the project either directly by earthwork, or by staging activities and vehicle movement adjacent to construction sites. In July 2010, the project team conducted a site visit with an USFWS representative to better define and map PMJM habitat.

Species Present

Data obtained from the USFWS, CDOW, and CNHP were compiled to identify TES species that potentially exist in the Study Area. Of the 11 species listed in Jefferson County, only one species, the Preble's Meadow Jumping Mouse, occurs in the Study Area. The PMJM is discussed in more detail below.

Preble's Meadow Jumping Mouse

PMJM was listed as a threatened species on May 13, 1998. On July 10, 2008, the Service removed the PMJM populations in Wyoming from the list of species protected under the ESA. The Service also amended the listing for PMJM to indicate the subspecies remains threatened in the Colorado portion of its range. Under existing regulations, either a habitat assessment or a full presence/absence survey for PMJM is required for any habitat-disturbing activity within areas determined to be potential PMJM habitat (generally stream and riparian habitats along the Colorado Front Range). Typically, PMJM occurs below 7,600 feet in elevation, and generally in lowlands with medium to high moisture along permanent or intermittent streams and canals (USFWS 2003). PMJM occurs in low undergrowth consisting of grasses and forbs, in open wet meadows, riparian corridors near forests, or where tall shrubs and low trees provide adequate cover (USFWS 2003). PMJM typically inhabits areas characterized by well-developed plains riparian vegetation with relatively undisturbed grassland and a water source nearby.

The USFWS has designated critical habitat for the PMJM along the South Platte River upstream of Chatfield Reservoir (USFWS 2009). The critical habitat designation for PMJM is variable along the Front Range, but the segment of the South Platte River adjacent to the Study Area that qualifies as critical habitat is quantified as the stream plus 140 meters (459 feet) on either side. The Study Area is immediately adjacent to, but falls outside of, designated critical habitat for PMJM. Given the proximity of the Study Area to designated critical habitat (and trapping efforts that confirmed the presence of PMJM along the South Platte River just outside the study area) the presence of PMJM within the Study Area is assumed in regard to this project. **Figure 3** shows the PMJM habitat within the Study Area.

Figure 3: PMJM Habitat Within the Study Area



Project Details

Construction

Impacts were defined as those actions that could potentially affect habitat function and/or wildlife functions. Direct impacts associated with the proposed action include construction disturbance, habitat loss, and an increase in the potential for wildlife/vehicle collisions due to increased vehicle activity. Indirect impacts included a decrease in vegetative cover.

Project Timeline and Sequencing

Duration of the project has not yet been determined, but is expected to last approximately 18 months.

Site Preparation

Clearing and grubbing will be required and shall extend to the toe of fill slopes and the top of cut slopes for the final roadway configuration. Clearing and grubbing will include the removal of all vegetation and debris including trees and shrubs. The contractor will likely clear the entire project site to allow for construction to occur in multiple locations.

Construction Access and Staging

Construction access will be via public roads. Staging will occur in temporary easements as noted above.

In-Water Work

The 3-72" existing pipes carrying Brush Creek under Waterton Road will be replaced by 3-10'x6' box culverts and will require work to be done in the creek. Shelves will be incorporated into the culvert designs to improve movement corridors for PMJM along Brush Creek. The widening of the Wadsworth Boulevard Bridge over Brush Creek will require work to be done adjacent to the creek to lengthen the abutments and to remove and construct new wingwalls.

Operations

The construction of the flyover for this project will allow a more free flow movement of traffic from southbound Wadsworth Boulevard to Waterton Road. It will reduce the congestion that presently occurs at the intersection of these two streets.

Future traffic volumes are anticipated to more than double by the year 2030 for both northbound and southbound directions due to a projected increase in employees at Lockheed Martin and future residential development south of this project.

Maintenance

With the addition of the flyover bridge, more ice reducing materials will be necessary in the winter. This may also occur on the new paved connection road between the Waterton parking lot and the Audubon parking area.

Sediment in the new water quality ponds will have to be removed periodically; a schedule for this removal has not been determined at this time. Maintenance vehicles will have access to each pond from adjacent public roadways.

With the addition of the pedestrian underpass more pedestrian trails were required. The trails will be constructed of crusher fines which will require regular maintenance such as grading and compacting to address any damage from heavy rains or spring snowmelt.

Permanent Impacts

The footprints of the permanent impacts include any new roadway or roadway widening and the cut/fill slopes related to that work. Permanent impacts to PMJM habitat total 1.91 acres (**Figure 4**). Combining the entrances to the Waterton Parking and Audubon Parking lots will improve safety, but will introduce a new paved road through an area that is currently highly vegetated.

The Southbound Wadsworth flyover will cross over Brush Creek with a support pier located on the north side of the creek and the bridge abutment located on the south. A retaining wall will be constructed between the abutment and the top bank of Brush Creek to avoid impacting the creek with embankment material.

Waterton Road in the area of the proposed pedestrian underpass will be raised approximately 20 feet above the existing ground. The pedestrian trail extending east out of the underpass will be graded to match the proposed Waterton Parking Access and the trail west will be graded to tie into the proposed Denver Water Board Maintenance Access. Wingwalls on both sides of the underpass will retain the sideslopes from Waterton Road.

Strategically placed water quality ponds will help reduce runoff from the paved surfaces from entering Brush Creek. A paved temporary detour will be constructed on the east side of Waterton Road to be used during construction. Part of this road will remain as the connection between parking lots and the remainder will be removed after construction is completed.

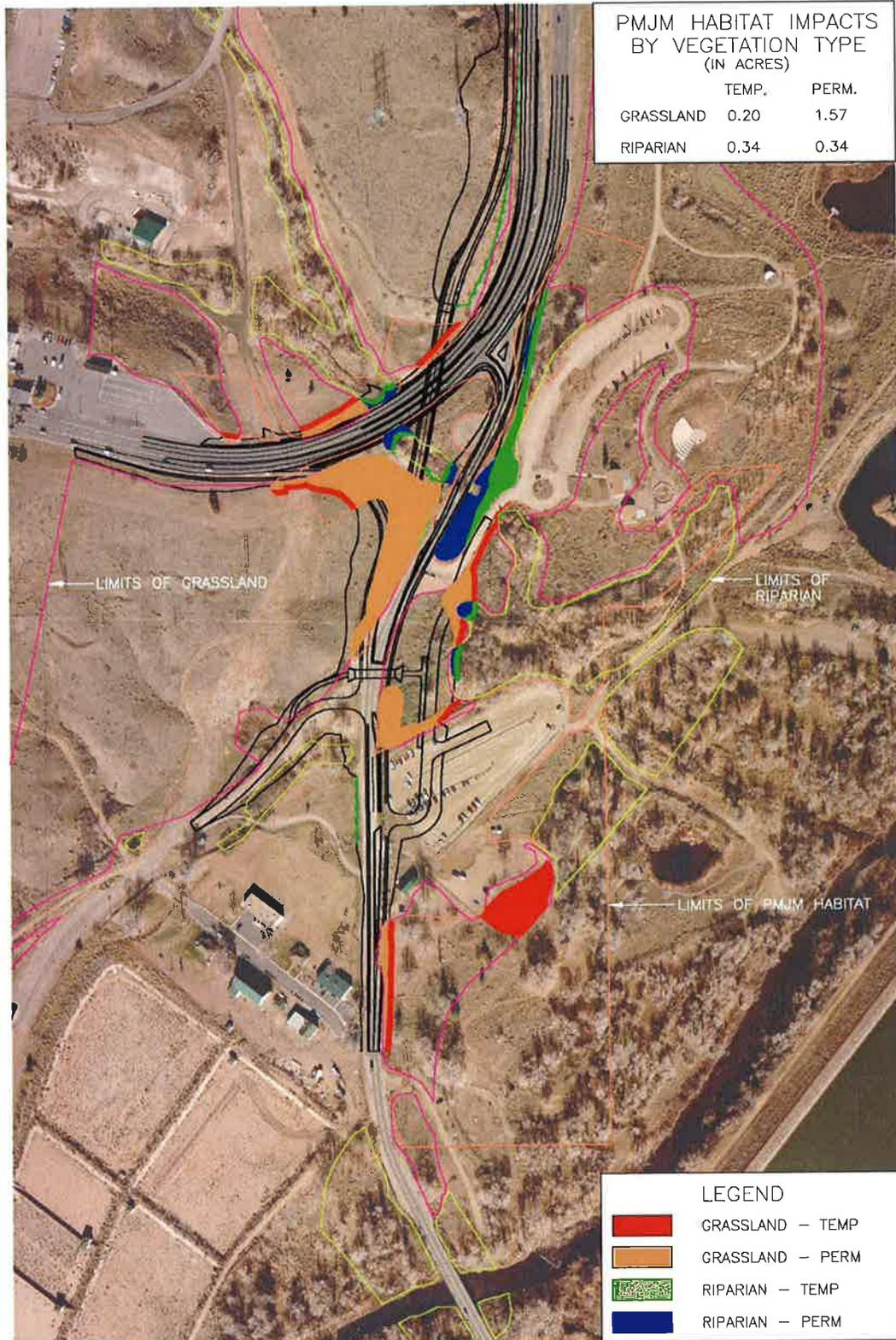
Temporary Impacts

Temporary easements will be required during construction along the south and west side of Wadsworth Boulevard and adjacent to both sides of Waterton Road. These easements will allow not only for the construction of the road widening and cut/fill slopes, but also for the storage of construction materials and equipment. Temporary impacts related to construction activities in grassland and riparian habitat total approximately .54 acres (see **Figure 4**). After construction is complete, these areas will be cleared and reseeded with native grasses and shrubs.

Effects Analysis

The proposed construction activities and improvements to the South Wadsworth/Waterton Road intersection would affect Preble's and their habitat. The total project impact area will be approximately 2.45 acres, including approximately .54 acres of temporary impacts and 1.91 acres of permanent impacts. The proposed action will result in the loss of habitat associated with Brush Creek. The removal of vegetation and the placement of fill will restrict PMJM further within the riparian areas. Upland vegetation removed will lessen the available forage within the Study Area. The proposed action does not fall within designated critical habitat.

Figure 4: Permanent and Temporary Impacts



Permanent effects from the proposed actions would result from new roadway or roadway widening. These areas consist primarily of grassland and woody vegetation/riparian habitat upstream and downstream of Brush Creek. These impacts would total approximately 1.91 acres. At this time it is not known if any construction activities (such as paving) will take place during the active season. It is possible that Preble's may react to changes in noise, lighting, or vibration by avoiding certain areas of habitat, moving nest site areas, moving hibernacula, or changing breeding behavior if construction activities occur during the active season. These changes could make them more susceptible to predation. Preble's are likely to remain in, or move to, higher quality habitat located within adjacent open space properties during the active construction periods.

Population isolation is probably the most serious extinction risk-factor for small vertebrate populations. Habitat within the project area likely provides a forage base, limited nesting opportunities, and movement potential. However, it is unlikely that habitat within the project area supports a resident population of Preble's.

Temporary, direct effects to Preble's would occur during construction. Although these effects are difficult to quantify, disturbances to habitat may affect breeding behavior, dispersal ability, and susceptibility to predation. The most common noise source would be from engine-powered heavy earth-moving equipment (bulldozers) and materials handling equipment for the girders (cranes). A total of approximately .54 acres of Preble's habitat would be temporarily impacted by the proposed action. The impacted habitat consists primarily of grassland and riparian shrubs downstream of Brush Creek. Some riparian vegetation (primarily willows) would be cleared upstream and downstream of Brush Creek. These willows will be trimmed to ground level (not grubbed), and then covered with a geo-textile fabric and an additional layer of straw. This area will then be covered with a minimum of 0.61 meters (2 feet) of clean fill. As soon as possible, all temporary fill will be removed to an upland area location. This will protect riparian shrub rootstock and seed banks. Much of this temporarily impacted habitat would be enhanced during mitigation with plantings that would include woody shrubs, primarily sandbar willow (*Salix exigua*).

Cumulative Effects

Cumulative effects may result from future state, local, or private actions that are reasonably certain to occur in the regional study area and that may destroy, degrade, or fragment PMJM habitat. In addition, human activities associated with infrastructure, industrial, and residential development and recreation may influence intra- and interspecies competition and favor predation. Domestic predators such as cats and dogs could have harmful effects on PMJM. Future development and related infrastructure are likely the most serious threats to any PMJM populations in or near the regional study area. New development in the regional study area may have cumulative adverse impacts to PMJM. Increased development in the regional study area will result in habitat loss, increased traffic volumes, increased noise and air pollution, increased human activity, and a greater number of domestic pets, plants, and livestock.

Activities associated with urban development may degrade PMJM habitat and disrupt movement corridors. Increased human activity, including noise and air pollution from machinery, may

discourage use of habitat. Human activity and associated development may constrain wildlife travel between adjacent blocks of habitat. Any increase in residential development likely will increase the number of domestic cats and dogs in areas adjacent to PMJM habitat, which may increase predation of PMJM.

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

Mitigation

Mitigation will be required for areas where impacts could not be avoided. Collectively, these areas will fulfill the compensatory mitigation requirements identified in the USFWS 4(d) rule.

In the rule, mitigation measures fall under three broad categories:

- *Restoration areas*: entails returning the functions of a disturbed, degraded, or totally altered site to its original status before it was damaged by a permitted project or action. Mitigation ratio of 1.5:1.
- *Enhancement areas*: the process of improving one or more functions of existing habitat to meet certain goals: eg. Reducing grazing, supplemental plantings. Mitigation ratio range of 1.5:1 to 3:1.
- *Creation areas*: involves converting unsuitable habitat types to Preble's habitat. Mitigation ratio of 3:1.

Section 7 of the Endangered Species Act requires agencies to minimize the degree of take associated with the project. Minimization efforts to decrease overall environmental impacts to PMJM habitat include the following:

- The majority of construction activities within PMJM habitat associated with Brush Creek will be limited to PMJM inactive season (November through April).
- Visible barriers will be used to limit the area of construction within PMJM habitat.
- Clearing and grubbing of vegetation will take place in early to mid August to prevent hibernation in areas to be disturbed by construction activities.
- No construction personnel, materials, or equipment shall be allowed outside of the construction work areas within PMJM habitat, as shown on plan sets.
- Stockpiling construction materials in bare areas, rather than on top of existing vegetation in PMJM habitat.
- Informing construction workers about the reasons for and importance of limiting impacts to vegetated habitat outside the work area in PMJM habitat.
- Supervising work on a daily basis to ensure that conditions established by the Service are met.
- Providing a report to the Service that includes photographic documentation of site conditions prior to and at the completion for construction.
- Contacting the Colorado Field Office of the Service immediately in the event that a Preble's mouse (dead, injured, or otherwise) is located during construction.

Despite minimization efforts, the project will result in a disturbance area of 2.45 acres. Using the 4(d) rule ratios as a guideline, the range of restoration/enhancement or creation of habitat needed for mitigation would range from 3.7 acres on the lower end (1.5:1 ratio) to 7.35 acres on the higher end (3:1 ratio).

Restoration and enhancement activities can offset impacts in areas of noxious weed infestation, totaling 0.4 acres, adjacent to Waterton Road and north of the Waterton Canyon trailhead parking area. Weed control will be followed by seeding with a native graminoid/shrub mix to increase forage available to PMJM in the area. Shelving will be installed in the three box culverts installed underneath Waterton Road, which will improve PMJM mobility within the project area.

Several conservation measures have been proposed to offset impacts associated with the project. In general, additional habitat restoration and enhancement opportunities may be available in habitat adjacent to the proposed project (within the South Platte floodplain). The majority of this property is owned and leased by the USACE or Denver Water. In general, opportunity to enhance existing mixed grass and riparian habitats would occur through planting of upland shrubs, riparian shrubs, noxious weed control, and reseeding with native grass species. Any implemented mitigation action will be monitored for three consecutive years to document progress and determine whether additional measures are required. In general, seventy percent survival rate for vegetation will be required and an annual monitoring report will be submitted to the USFWS.

Implementation of conservation measures would ensure that the proposed project would not jeopardize the continued presence of PMJM populations in riparian and upland habitat associated with Brush Creek.

**It should be noted that mitigation activities detailed here are conceptual- formal approval from the USACE or Denver Water will be required prior to initiating a formal mitigation plan for the proposed project. A site visit will also be necessary to identify and quantify areas of restoration/enhancement. The proposed mitigation activities are also subject to approval by USFWS.*

Effect Determinations

Construction of the South Wadsworth Boulevard/Waterton Road improvements is *likely to adversely affect* habitat of PMJM. The project design, construction activities, and schedule are planned to minimize potential impacts to PMJM habitat within the project area. On-site and off-site mitigation measures, including the addition of culvert shelving to improve PMJM movement, weed control, and revegetation efforts in adjacent habitat would restore and enhance habitat following the completion of construction. Although the project will result in the loss and alteration of PMJM habitat, project construction and operation will not result in further fragmentation of habitat or loss of connectivity within and between populations in the project area.

References

USFWS. 2009. Revised Critical Habitat for the Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*) in Colorado. Federal Register. Vol 74. No 194. 52066-52107.

USFWS. 2003. Draft Recovery Plan- Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*). Region 6, Lakewood, Colorado. 96 pp.

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