



Consultants in Natural Resources and the Environment

Biological Assessment and Report
Larkspur Travel Center
Larkspur, Colorado
Douglas County, Colorado

Prepared for—

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Title Page

Lead Agency: U.S. Army Corps of Engineers

Legal Authority: Endangered Species Act of 1973, as amended,
Section 7(a)(2), 16 U.S.C. 1536 (c)

Project Name: Larkspur Travel Center

Location: Douglas County, CO
T9S, R67W, SW ¼ Section 22 and NW ¼ Section 27
Larkspur, CO Quadrangle

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Introduction

The Larkspur Travel Center is proposed for commercial development by Off-the-Chain 2 LLC on a parcel of land at the intersection of Spruce Mountain Road and Upper Lake Gulch Road in Larkspur, Douglas County, Colorado (project area; Figure 1). The proposed commercial development would require grading and filling an isolated wetland along East Plum Creek, and temporary and permanent construction into wetlands along East Plum Creek for outfall structures. The wetlands along East Plum Creek are regulated under Section 404 of the Clean Water Act, administered by the U.S. Army Corps of Engineers (Corps).

The area to be developed consists of rangeland primarily on an elevated terrace above the 100-year floodplain on the west side of East Plum Creek (Figure 2). The purpose of this biological assessment (BA) is to review the proposed Larkspur Travel Center 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 (16 U.S.C. 1536 (c)), as part of the Corps permit process to address possible effects on federally listed species. The BA includes a description of the proposed project, a description of the existing conditions in the project area, an analysis of project-related impacts to threatened and endangered species, and a description of proposed mitigation measures for impacts to threatened and endangered species.

Tim Dumler retained ERO Resources Corporation (ERO) to assess the project limits for sensitive wildlife resources and potential habitat for federally listed threatened and endangered species and other sensitive wildlife for the proposed commercial development project. Wildlife addressed in this BA includes federal threatened and endangered species.

Federal Action

Because work is proposed in or near East Plum Creek and its associated wetlands, the project will require authorization by the Corps due to its jurisdiction over Plum Creek under Section 404 of the Clean Water Act. The work will likely be authorized under Nationwide Permit (NWP) 7. Nationwide Permit 7 authorizes activities associated with outfall structures constructed within waters of the U.S.

The East Plum Creek Corridor provides habitat for the Preble's meadow jumping mouse (Preble's), listed as a threatened species under the Endangered Species Act (ESA). Some of the proposed action is outside of the Douglas County Riparian Conservation Zone (RCZ). The RCZ was developed as part of the Douglas County Regional Habitat Conservation Plan (DCRHCP 2006). According to the DCRHCP (page 10), the RCZ establishes the geographic limits of Preble's habitat on nonfederal lands in Douglas County; however, the Service considers areas within 300 feet of the 100-year floodplain as habitat for Preble's (06E24000-2016-TA-0143), essentially including the entire property. Part of the NWP process

Figure 1. Vicinity Map

Figure 2. Existing Conditions

includes this formal consultation with the U.S. Fish and Wildlife Service (Service) on potential impacts to Preble's. Section 7(a)(2) of the ESA states that each federal agency shall ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species or result in the adverse modification of designated critical habitat (50 CFR §402). This formal consultation is carried out according to Section 7 of the ESA.

Consultation History

- On May 6, 2016, the Service visited the site with ERO and the project proponents to discuss previously completed grading, a proposal to continue grading of Phase I of the project, and potential future development on the property.
- On May 23, 2016, ERO submitted a proposal for installing erosion control measures according to the project grading, erosion, and sediment control (GESC) plan and stormwater management plan (SWMP).
- On July 20, 2016, ERO received a response to the May 23 correspondence from Drue DeBerry, acting Colorado field supervisor (Appendix A). The Service determined that without final plans or a complete proposal for the entire project, they were unable to fully evaluate potential effects on Preble's from the entire action and therefore were unable to comment on the effects determination for the first phase of the project. The Service listed conservation recommendations that, if implemented, could help the project proponents minimize effects on Preble's from the Phase I proposal.
- On October 14, 2016, the Service visited the site with the project proponents and ERO to discuss the complete proposed project and potential mitigation measures.
- On December 20, 2016, the Service and Corps met with ERO and the project team to discuss the proposed project, draft Biological Assessment, and Pre-Construction Notification.

Action Area

The action area is defined as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR 402.02). The action area includes the development footprint; detention and outfall structures, including reinforced outfall into East Plum Creek; and 58.11 acres of property containing the East Plum Creek floodplain that would be preserved as open space in a conservation easement, deed restriction, or management plan. Surface water runoff from the property would be controlled and discharged into Plum Creek at historical levels, and there would be no significant downstream impacts to surface water flows or water quality.

Project Location

The project area is located along East Plum Creek in the Larkspur USGS Quadrangle, SW ¼ of Section 22 and NW ¼ of Section 27, Township 9 South, Range 67 West of the Sixth Principal Meridian in Douglas County, Colorado (Figure 1). The project area consists of undeveloped land located northeast of the intersection of Spruce Mountain Road and East Upper Lake Gulch Road. The project area is generally bounded by I-25 to the north, East Plum Creek and undeveloped land to the east, Upper Lake Gulch to the south, and Spruce Mountain Road to the west. The UTM coordinates of the approximate center of

the project area are 510114mE and 4343864mN, Zone 13. The latitude/longitude of the project area is 39.244036°N/104.882791°W. The elevation of the project area is approximately 6,630 feet above sea level.

Ecological Setting of the Study Area

The study area consists of foothill habitat zones typical for this portion of Douglas County, Colorado. The elevation in the study area ranges from approximately 6,640 to 6,700 feet above sea level. The study area is within the incorporated limits of Larkspur and provides some of the only available commercial properties within the town. The general topography of the parcels consists of upland benches (terrace) on the west side of the parcels that slowly transition down to the Plum Creek floodplain. The study area is bounded on the north by I-25, on the east by the Denver and Rio Grande Western Railroad, and on the west by County Road 53 and BNSF Railroad (Figures 1 and 2). State Highway 18 (Upper Lake Gulch Road) forms the southern boundary of the parcel. The majority of the study area contains the broad floodplain of East Plum Creek as it runs south to north across the study area. Some of the natural hydrologic functioning of the East Plum Creek floodplain has been modified and constricted by the railroad and State Highway 18. Construction of I-25 included extensive filling of the floodplain and constraining natural meandering flows of E. Plum Creek to a narrow, heavily armored channel.

The vegetation within the action area is dominated by upland vegetation consisting of smooth brome (*Bromus inermis*), crested wheatgrass (*Agropyrum cristatum*), mares tail (*Conyza canadensis*), hairy false goldenaster (*Heterotheca villosa*), fringed sage (*Artemisia frigida*), and western wheatgrass (*Pascopyrum smithii*) (Photo 1). Woody vegetation is scattered throughout the uplands of the project area in riparian areas along East Plum Creek and along the western border of the project area in the northern half. Woody vegetation within the project area consists of sandbar willow (*Salix exigua*), Gambel oak (*Quercus gambelii*), western snowberry (*Symphoricarpos occidentalis*), Woods' rose (*Rosa woodsii*), and ponderosa pine (*Pinus ponderosa*) (Photos 2 and 3). An isolated depression containing wetlands is located in the center of the project area (Photo 4).

East Plum Creek flows north along the eastern border of the project area, and wetlands were observed along the banks of East Plum Creek in the project area (Figure 2; Photos 5 and 6). Plum Creek wetlands are dominated by sedges (*Carex* sp.) and reed canarygrass (*Phalaris arundinacea*), and include patches of shrubby riparian wetlands with sandbar willows (Figure 2). Other mesic shrubs include chokecherry (*Prunus virginiana*), alder (*Alnus incana*), and snowberry. Plains cottonwood (*Populus deltoides*) and narrowleaf cottonwood (*P. angustifolia*) are scattered along the floodplain. Nonnative species occurring in patches include yellow toadflax (*Linaria vulgaris*), thistle (*Cirsium* spp.), common mullein (*Verbascum thapsus*), and diffuse knapweed (*Centaurea diffusa*).

Project Description

Overall Project Description

The proposed Larkspur Travel Center consists of a commercial development on the north side of Larkspur, Colorado. The development would include construction of retaining walls, grading, and construction of roads, underground utility lines, parking lots, and several stand-alone buildings (Figure 3 and Appendix B). On-site detention would be constructed and outlet into East Plum Creek. Interior roads would connect to Spruce Mountain Road and East Upper Lake Gulch Road. A gas/service station would be located on the southern end of the development, with commercial space for retail occurring in the northern section of the development. Based on the site grading plan, the total project footprint occurs on 9.76 acres. All construction and lay-down areas would occur within the project footprint.

After discussions with the Service, the plans have been modified to include a single retaining wall with a graded earth slope down to the floodplain to reduce the footprint of the retaining wall. Bear-proof trash cans would be installed to reduce the likelihood of other animals getting into them. Water quality and detention would be provided on-site and below ground to reduce the area impacted. The design includes a fence at the top of the wall to keep people from wandering into Preble's habitat or the abutting wetlands. The adjacent roads would need to be widened as part of the development; however, the roads would only be widened within the overall project footprint or north of Spruce Mountain Road. Other aspects of the commercial development are discussed in further detail below.

Lighting

All lighting on-site will be downcast LED full-cutoff fixtures that comply with the International Dark-Sky Association's recommendations for outdoor illumination. Additionally, lighting recommendations for fueling areas will take into account the Illuminating Engineering Society of North America's (IESNA's) recommendations for handling of flammable liquids. Shielding and directing of lighting will be used to minimize light spill off the site. Additionally, lights may be dimmed or extinguished at night based on operational hours of the travel center and pad sites.

Potential Fuel Spill

Drainage of stormwater from the site has the potential to contain pollutants from minor and major petroleum spills. Minor spills at the fueling area would be picked up by runoff and captured by at-grade rain gardens prior to discharging to the underground detention system. These rain gardens would be constructed per Douglas County and Urban Drainage and Flood Control District's standards. The rain gardens use sand filtering and bioremediation to remove pollutants, including VOC's and petroleum products. Larger spills that may be caused by a rupture in a truck's fuel tank may bypass the rain

Figure 3. Preble’s Meadow Jumping Mouse Permanent Impacts

gardens due to the large volume of the spill. These spills would be captured by a sumped manhole with the capacity to hold the spill and allow a cleanup crew to remove the contamination. A “snorkel” or oil separator will pull water from under the water surface, allowing the petroleum to float on the water and not enter the underground system. This way, there will be protection from potential contamination of the underground detention system even if the spill occurs during rainy weather.

Federally Threatened, Endangered, and Candidate Species Potentially Affected by the Project

Federally threatened and endangered species are protected under the Endangered Species Act (ESA) of 1973 as amended (16 U.S.C. 1531 et seq.). The ESA defines an endangered species as “a species in danger of becoming extinct throughout all or a large portion of its range” and a threatened species as “a species likely to become endangered in the foreseeable future” (ESA 50 CFR 17.3). Section 4 of the ESA prohibits “take” of any federally listed species. Take is defined as to harm, harass, pursue, hunt, shoot, wound, kill, trap, capture, or collect wildlife being addressed. Potential effects on a federally listed species or its habitat resulting from a project with a federal action require consultation with the Service under Section 7 of the ESA.

Candidate species are plants and animals for which there is sufficient information on their biological vulnerability to support federal listing as endangered or threatened (ESA 50 CFR 17.3), but listing is precluded by other higher-priority listing activities. No regulations require consultation for effects on candidate species; however, if a candidate species becomes listed during project planning or construction, consultation with the Service is required. A list of federally listed species potentially occurring within Douglas County (Table 1) was obtained from the Service (2016).

Table 1. Federally threatened, endangered, and candidate species potentially found in Douglas County or potentially affected by projects in Douglas County.

Common Name	Scientific Name	Status*	Habitat	Suitable Habitat Present
Mammals				
Preble's meadow jumping mouse	<i>Zapus hudsonius preblei</i>	T	Shrub riparian/wet meadows. A portion of the project area is located within the Douglas County RCZ	Yes
Birds				
Interior least tern**	<i>Sterna antillarum athalassos</i>	E	Sandy/pebble beaches on lakes, reservoirs, and rivers	No depletions anticipated
Mexican spotted owl	<i>Strix occidentalis</i>	T	Closed-canopy forests in steep canyons	No—outside of range
Piping plover**	<i>Charadrius melodus</i>	T	Sandy lakeshore beaches, sandbars	No depletions anticipated
Whooping crane**	<i>Grus americana</i>	E	Mudflats around reservoirs and in agricultural areas	No depletions anticipated
Fish				
Greenback cutthroat trout	<i>Oncorhynchus clarki stomias</i>	T	Cold, clear, gravel headwater streams and mountain lakes	No—outside of range
Pallid sturgeon**	<i>Scaphirhynchus albus</i>	E	Large, turbid, free-flowing rivers with gravel or sandy substrate	No depletions anticipated
Insects				
Pawnee montane skipper	<i>Hesperia leonardus montana</i>	T	Open ponderosa pine woodlands (6,000 to 7,500 feet); requires blue grama and prairie gayfeather	No—outside of range
Plants				
Colorado butterfly plant	<i>Gaura neomexicana ssp. coloradensis</i>	T	Subirrigated, alluvial soils on level floodplains and drainages between 5,000 to 6,400 feet	No, habitat on-site not conducive to establishment of this species
Ute ladies'-tresses orchid	<i>Spiranthes diluvialis</i>	T	Moist to wet alluvial meadows, floodplains of perennial streams, springs and lakes below 6,500 feet	No, habitat on-site not conducive to establishment of this species
Western prairie fringed orchid**	<i>Platanthera praeclara</i>	T	Moist to wet prairies and meadows	No depletions anticipated

*T = Federally Threatened Species, E = Federally Endangered Species.

**Water depletions in the South Platte River may affect the species and/or critical habitat in downstream reaches in other counties or states. Source: Service 2016.

Critical Habitat

The project area contains no designated or proposed critical habitat for any listed species (Service 2016).

Consultation Standard

Section 7(a)(2) of the ESA requires that all federal agencies, “in consultation and with assistance” of the Service, “insure that any action authorized, funded, or carried out by such agency...is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat for such species, which is determined...to be critical.”

The regulations implementing Section 7(a)(2) specify that the purpose of consultation is to allow the Service to:

- a) evaluate all relevant information provided by the “action agency” (Corps) and to conduct an on-site inspection to gather such information;
- b) determine the current status of the listed species or critical habitat;
- c) assess the effects of the action on the listed species or critical habitat;
- d) formulate a “biological opinion” as to whether the action, in this case the authorization under a Nationwide Section 404 permit, is likely to jeopardize the continued existence of listed species; and
- e) discuss the availability of reasonable and prudent alternatives in the case of issuance of a jeopardy opinion. 50 C.F.R. §402.14(g).

South Platte River Species

The interior least tern, piping plover, whooping crane, pallid sturgeon, and western prairie fringed orchid are species found in habitat provided by the Platte River system. The interior least tern, piping plover, and whooping crane may migrate through Colorado or may occasionally nest on wide sandy shores of reservoirs, typically in eastern Colorado. The pallid sturgeon is a fish found in the Missouri and middle Mississippi Rivers. The western prairie fringed orchid is a plant species found in tallgrass prairie ecosystem habitats west of the Mississippi River.

Potential Habitat

Suitable habitat for the interior least tern, piping plover, whooping crane, pallid sturgeon, and western prairie fringed orchid is not found in the project area.

Effects of the Proposed Action

Because of the absence of suitable habitat, the proposed project would have no direct effect on the interior least tern, piping plover, whooping crane, pallid sturgeon, or western prairie fringed orchid.

With regard to possible water depletions to the Platte River system, project elements that could result in depletions include dust-abatement activities from construction and water use from the commercial development. As currently proposed, these elements would not result in depletions, because water used for dust abatement and for the commercial development would be obtained from municipal

sources from Larkspur. Larkspur uses deep aquifer water that is nontributary to the South Platte River; therefore, the proposed improvements would not result in depletions and would have no indirect effects on the interior least tern, piping plover, whooping crane, pallid sturgeon, or western prairie fringed orchid.

Mexican Spotted Owl

Species Background

The Mexican spotted owl (spotted owl) is listed as threatened under the ESA. Threats include habitat loss and fragmentation. The population trend is probably downward because of past and continuing loss and fragmentation of habitat, especially due to even-age timber management. The spotted owl is threatened in some areas by the potential for catastrophic fire. The total spotted owl population was about 800 to 1,500 in the early 1990s (NatureServe 2010).

The spotted owl is found from Colorado to Utah; throughout portions of New Mexico, Arizona, and Texas; and south to central Mexico. In Colorado, the spotted owl typically inhabits areas with steep, exposed cliffs; canyons that are characterized by piñon-juniper; and old-growth forests mixed with Douglas fir, ponderosa pine, and white fir (Andrews and Righter 1992; Service 1995). Designated critical habitat for the spotted owl occurs in the Pike National Forest in western El Paso and Douglas Counties and eastern Teller and Fremont Counties (69 FR 53182 [August 31, 2004]).

Suitable Habitat and Effects of the Proposed Action

There is no suitable habitat for the Mexican spotted owl in the project area. The project area does not contain any steep cliffs or canyons. Also, the project area is not near any designated critical habitat. The nearest critical habitat for this species is in the Pike National Forest in western Douglas and El Paso Counties. Based on these reasons, the spotted owl is unlikely to occur in the project area, and the proposed project would have no effect on the Mexican spotted owl.

Greenback Cutthroat Trout

Species Background, Habitat Requirements, and Distribution

This federally and state-threatened trout is a native of the Front Range of Colorado and is found in isolated headwaters of mountain streams. The greenback cutthroat trout inhabits clear, cold, and well-oxygenated streams with gravel to rocky substrate and abundant riparian vegetation (USFS 1997). It requires instream cover, and it does best in waters where other competing trout species are absent (USFS 1997). The greenback cutthroat trout is threatened due to overfishing; stocking of rainbow, brook, brown, and Yellowstone cutthroat trout in their habitat; and loss of high-quality trout stream habitat due to logging, livestock overgrazing, water diversions, and municipal and industrial pollution (CROW 2006).

Suitable Habitat and Effects of the Proposed Action

No greenback cutthroat trout are known to be present in the project area. The proposed action would not impact greenback cutthroat trout, because this species is not present in the project area.

Pawnee Montane Skipper

Species Background

The Pawnee montane skipper (skipper) was first federally listed on September 25, 1987. It is currently designated as threatened in the entire range (52 FR 36176). The skipper is a small brownish-yellow butterfly with a wingspan just over 1 inch and occurs in dry, open ponderosa-pine woodlands at elevations from 6,000 to 7,500 feet above msl. Blue grama, the primary larval food plant, and prairie gayfeather (*Liatris punctata*), the primary nectar plant, are necessary components for skipper habitat. The skipper occurs only in portions of Jefferson, Douglas, Teller, and Park Counties on the Pikes Peak Granite Formation in the South Platte River drainage system (Proctor 1998).

Potential Habitat and Effects of the Proposed Action

The project area is outside of the Pikes Peak Granite Formation and does not contain prairie gayfeather, a species necessary for skipper habitat. The Pawnee montane skipper is unlikely to occur at the project area; therefore, the proposed project would not affect this species.

Colorado Butterfly Plant

Species Background

The Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*, CBP) is federally listed as threatened under the ESA and is found within a small area in southeastern Wyoming, western Nebraska, and north-central Colorado (NatureServe 2010). On August 6, 2004, critical habitat for CBP was proposed in southeastern Wyoming, southwest Nebraska, and Larimer County in northeast Colorado (Service 2004). In January 2005, the Service designated 3,538 acres of critical habitat along approximately 50 stream miles within Platte and Laramie Counties in Wyoming (70 Federal Register 1940).

The CBP is a short-lived perennial herb found in moist areas of floodplains. It occurs on subirrigated alluvial soils on level or slightly sloping floodplains and drainage bottoms at elevations from 5,000 to 6,400 feet above msl. Colonies are often found in low depressions or along bends in wide, active, meandering stream channels that are periodically disturbed. Historically, the main cause of disturbance was probably flooding (Service 2004). The CBP flowers from June to September and produces fruit from July to October (Spackman et al. 1997).

Suitable Habitat and Effects of Proposed Action

The Service has not established formal survey guidelines for the CBP but has indicated that areas similar to, and slightly drier than, Ute ladies'-tresses orchid (orchid) habitat should be assessed. The project area is above the 6,400 feet elevational limit for CBP. In addition, there is no potential habitat for CBP

along this reach of East Plum Creek. The wetland areas in the project area contain dense stands of sandbar willow and reed canarygrass, likely preventing establishment of CBP. The project area does not contain moist areas along the floodplain where CBP would likely establish. For these reasons, ERO believes that Colorado butterfly plant habitat is not present in the project area, and the proposed project would not affect this species.

Ute Ladies'-Tresses Orchid

Species Background

The orchid (*Spiranthes diluvialis*) is a federally threatened species that occurs at elevations below 6,500 feet in moist to wet alluvial meadows, in floodplains of perennial streams, and around springs and lakes (Service 1992). Generally, the preferred vegetative cover for the orchid is relatively open; dense, overgrown sites are not conducive to establishment of the species. Where the orchid is found, soils are typically alluvial deposits of sandy, gravelly material that are saturated to within 18 inches of the surface for at least part of the growing season.

The main reason for this species' decline appears to be drastic modification of riparian habitat by urbanization and stream channelization. Because of this decline, the Service listed this species as threatened under the ESA in 1992 (Service 1992). When listing occurred, the orchid was found only in Colorado, Utah, and Nevada. Since then, the species has been found in Wyoming, Montana, Nebraska, and Idaho. The largest known population occurs in Colorado (NatureServe 2010).

Suitable Habitat and Effects of the Proposed Action

The project area is above the 6,500-foot upper elevation limit of the species. Additionally, there is no suitable orchid habitat in the project area. Wetland areas in the project area contain dense stands of sandbar willow and reed canarygrass, likely preventing establishment of this species. Smaller wetland areas in the project area are likely frequently scoured away during storm events, making it unlikely that a viable orchid population could establish. Furthermore, the vegetation in the riparian areas is dominated by species not typically found with the orchid. The proposed project would have no effect on Ute ladies'-tresses orchid, because no suitable habitat is present in the project area.

Preble's Meadow Jumping Mouse

Species Background

Preble's was listed as a federally threatened subspecies under the ESA in May 1998 (63 FR 26517 [May 13, 1998]). Critical habitat has been designated along portions of the North Fork of the Cache la Poudre River, the Cache la Poudre River, Buckhorn Creek, and Cedar Creek in Larimer County; along West Plum Creek and Cherry Creek in Douglas County; along the Upper South Platte River in portions of Douglas County, Jefferson County, and Teller County; along Ralston Creek in Jefferson County; along South Boulder Creek in Boulder County; at Rocky Flats in Jefferson County; and along Monument Creek in El Paso County (75 FR 78430 [December 15, 2010]).

Habitat

Along Colorado's Front Range, Service survey guidelines recommend evaluating areas for potential Preble's habitat below 7,600 feet above msl, generally in lowlands with medium to high moisture along permanent or intermittent streams. Preble's typically inhabits areas characterized by well-developed plains riparian vegetation with relatively undisturbed grassland and a water source nearby (Armstrong et al. 1997). Previous studies have suggested that Preble's may have a wider ecological tolerance than previously thought and that the requirement for diverse vegetation and well-developed cover can be met under a variety of circumstances (Meaney et al. 1997). Radio-tracking studies conducted by the Colorado Parks and Wildlife (CPW) have documented Preble's using upland habitat adjacent to wetlands and riparian areas (Shenk and Sivert 1999). Additional research by the CPW has suggested that habitat quality for Preble's can be predicted by the amount of shrub cover available at a site (White and Shenk 2000).

In 2006, Douglas County completed a Habitat Conservation Plan (DCHCP) for Preble's that permits "take" of the species when the take is incidental with certain otherwise legal activities specified in the DCHCP. As part of the DCHCP, Douglas County delineated riparian areas and adjacent upland habitats in Douglas County with a high likelihood of supporting Preble's and established a Riparian Conservation Zone (RCZ) that protects riparian habitat values for Preble's and numerous other species that are not the subject of the DCHCP. The RCZ was developed to:

- be biologically defensible by using the best scientific and commercial data available; and
- delineate potential habitat to include areas needed for all aspects of Preble's life cycle (e.g., water, cover, nesting, breeding, foraging, movement, and hibernation).

Distribution

Preble's is found along the foothills of southeastern Wyoming and southward along the eastern edge of the Colorado Front Range to Colorado Springs (Clark and Stromberg 1987; Fitzgerald et al. 1994). The semiarid climate in southeastern Wyoming and eastern Colorado limits the extent of riparian corridors and, therefore, restricts Preble's range, which is associated with these corridors. In Douglas County, Preble's has been primarily found along East Plum Creek, West Plum Creek, Cherry Creek, and their tributaries. Previous trapping surveys confirmed that Preble's occupy East Plum Creek, with the closest capture near the State Highway 18 bridge.

Affected Environment

To quantify the effects of the proposed project on Preble's habitat and describe conditions following project construction, ERO mapped and quantified Preble's habitat in the project area.

Habitat Mapping

ERO mapped suitable Preble's habitat within the project parcel for a previous property owner following habitat categories agreed to in the field with Peter Plage of the Service. In 2016 ERO visited the parcel and confirmed these habitat designations within the project area limits (ERO 2016). Site-specific habitat

mapping was landscape based and included all habitat components essential for the biological needs of reproducing, rearing young, foraging, sheltering, hibernation, dispersal, and genetic exchange (Figure 3).

Vegetation community types were the key elements used to determine the outer extents of suitable Preble's habitat in the project area. In general, Preble's habitat in the project area includes riparian shrub and tree habitat and immediately adjacent uplands. Roads, bare ground, and large patches of monoculture noxious weeds were not included as habitat. ERO used field surveys, 2016 aerial photography, Google Earth imagery, and topographic mapping to assign quality ratings to the habitat based on the type and amount of vegetation cover, proximity to East Plum Creek, and proximity to suitable habitat. The objective of habitat mapping is to identify all potentially suitable Preble's habitat and movement corridors likely to be directly or indirectly impacted by the proposed project. For this reason, habitat mapping was overly inclusive. The quality of Preble's habitat was based primarily on the field survey and the wetland mapping that was conducted in the project area, and then aerial photography was used to refine field mapping. Habitat-quality mapping was overly inclusive due to including small and degraded patches of habitat.

Habitat

Preble's mice have been captured within and near the Plum Creek drainage, and the entire creek, including East Plum Creek and adjacent uplands extending 300 feet from the 100-year floodplain, is considered by the Service to be Preble's occupied habitat (DeBerry 2016, Appendix A). A total of 9.76 acres of Preble's habitat was identified within the project area limits, consisting of 8.36 acres of upland foraging habitat, 0.29 acres of riparian shrubs that provide overall habitat, and 1.11 acres of Gambel oak and upland shrubs that provide security habitat (Figure 3). The types of habitat found in the project area are discussed below.

- **Overall Habitat** includes wetland or riparian vegetation and areas adjacent to East Plum Creek with at least 50 percent cover of woody vegetation such as sandbar willow, small plains cottonwood, chokecherry, snowberry and alder. The percent cover of herbaceous vegetation varies, but native species are dominant, and there is minimal to no disturbance from pedestrian trails or other activities. Overall habitat provides most of the primary constituent elements of critical habitat.
- **Forage Habitat** includes open grassland patches within the riparian corridor, and upland benches west of East Plum Creek. Little to no woody vegetation is present with a sparse to moderate herbaceous cover (20 to 70 percent) consisting mostly of smooth brome, western wheatgrass, and blue grama. These upland areas provide areas for foraging and some connectivity for dispersal and genetic exchange.
- **Security Habitat** includes mesic and upland shrublands, such as three-leaf sumac and Gambel oak. These areas provide woody vegetation that can provide protection from overhead predators during foraging or dispersal activities, but lacks understory vegetation for foraging. Security habitat can provide suitable sites for hibernation.

Effects of the Action

Direct Effects

The proposed commercial development would result in direct and indirect impacts on Preble's and its habitat. Potential direct effects on Preble's from the project include inadvertent mortality or injury to Preble's, hibernacula being crushed by machinery, and disruption of normal dispersal, foraging, breeding, or hibernation behaviors during construction and the permanent loss of 8.36 acres of forage, 0.29 acres of overall habitat, and 1.11 acres of security habitat (Figure 3). The remainder of the areas within the limits of construction (0.30 acres) consists of noxious weeds and other areas of nonhabitat. Disruptions to normal behaviors may result in death or reduced productivity. ERO has taken a conservative estimate and assumed all impacts are permanent, even though some of the areas disturbed may be reseeded with native seed mixes. These direct disturbances to Preble's habitat would adversely impact Preble's. Measures proposed to avoid, minimize, and offset potential impacts to Preble's and its habitat, including compensatory mitigation, are discussed in the Conservation Measures section.

Indirect Effects

Ongoing indirect adverse effects on Preble's and its habitat may result from increased traffic and human encroachment to the area from the gas station and commercial development. The design would include signs and fences to discourage pedestrians from leaving the commercial development, as discussed under Conservation Measures. Indirect effects may also include inadvertent mortality or injury to Preble's, displacement from habitat, and disruption of normal Preble's behavior by increased activity within the area. Although the proposed project would increase noise levels adjacent to Preble's habitat, the increase in noise levels would be minimal when compared to the surrounding environment. Noise levels currently occur due to the presence of Interstate 25 directly north and east of the project area (~63,774 vehicles per day); a northbound railroad 300 feet east that blows its warning horn at Upper Lake Gulch Road; a southbound railroad 100 feet west that has a high volume of coal trains daily; and Upper Lake Gulch Road (~2,958 vehicles per day) and Spruce Mountain Road (~3,015 vehicles per day), which border the project area. Therefore, the additional noise from proposed commercial development would likely have a minimal incremental effect on Preble's.

Stormwater runoff from the proposed commercial development may have an adverse effect on Preble's because of the increased amount and timing of water entering East Plum Creek, which could cause changes to Preble's habitat downstream. A GESC and SWMP have been prepared for the project and would be implemented during grading/filling operations. The stormwater runoff during construction would be controlled, and the outlet from the sediment basin would not exceed current runoff rates and therefore would not cause any erosion or indirect impacts to Preble's habitat abutting the project area.

Cumulative Effects

Cumulative effects are the potential effects of the proposed action in combination with past actions and future actions. Cumulative effects are defined "as the impact on the environment which results from

the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the action area. Cumulative impacts can result from individually minor, but collectively significant actions taking place over time” (40 CFR 1508.7).

The analysis of cumulative effects requires identification of past actions that have influenced the environment, the direct and indirect effects of the proposed action, and reasonably foreseeable future actions that if implemented also would contribute to cumulative effects. The cumulative effects analysis includes those environmental resources of particular concern in the study area that may be affected by the proposed action. A time frame and geographic area are also established for the cumulative effects analysis. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the ESA.

Activities that destroy or fragment the habitat of threatened, endangered, and candidate species may adversely affect the species. Such activities include livestock grazing, residential development, recreation, and habitat degradation by nonnative plant species.

There may be adverse cumulative impacts to threatened, endangered, or candidate species as a result of future development activities in Douglas County. Recreation and development are likely the most serious threats to any threatened, endangered, or candidate species in Douglas County. This discussion of cumulative impacts focuses on Preble’s, but most of the discussion applies to the other species as well.

Recreation

Douglas County adopted the 1998 Parks, Trails, and Open Space Master Plan (Open Space Master Plan) to provide a strategic framework for the development and management of parks and trails and conservation of open space (Douglas County 1998). As an element of the Douglas County Master Plan, the Open Space Master Plan serves as a guide and policy document for county staff, officials, and the public regarding park and trail opportunities and open-space conservation.

Ongoing recreation facility development, as outlined in the Open Space Master Plan, identifies the potential for development of a regional trail along East Plum Creek. This trail currently runs from Castle Rock to The Meadows development. Long-term trail plans include extending the trail to the south toward Larkspur. A right-of-way for trail development on the west side of the Larkspur Travel Center has been identified and dedicated to Douglas County. Any direct and indirect effects of the trail would be covered and mitigated through the Douglas County Regional HCP.

Effects of recreational activities on Preble’s may be influenced by several factors, such as the type and quality of habitat in which the activity occurs, the time of year for the activity, the type of activity, and the pattern, frequency, and intensity of activity.

Development

There are several measures or ordinances in place or under consideration to regulate and plan for growth in Douglas County. These measures are described below.

Zoning Ordinances

The City of Larkspur has a zoning ordinance that directs all development in the city with review and the planning commission and Town Council. The Douglas County Zoning Resolution (Resolution) outlines zoning districts in unincorporated Douglas County, the type of development that is allowed in each zoning district, and the review process required prior to development.

Douglas County Comprehensive Master Plan

The 2035 Douglas County Comprehensive Master Plan (Douglas County Planning Commission 2014) serves as a policy guide for decisions that affect the physical and socioeconomic development the county. Douglas County Plan policies lay the foundation for development regulations and guidelines outlined in the Resolution.

The Douglas County Plan Land Use Map outlines existing land uses throughout the county. The Larkspur Municipal Planning Area map depicts most undeveloped land north of Larkspur and much of the land south of the Larkspur Planning Area as Open Space, severely restricting future development, particularly East Plum Creek. Upland parcels located between the project site and downtown Larkspur are zoned for commercial development. Parcels containing wetland and riparian vegetation communities between the project site and downtown are proposed for protection through deed restrictions.

Livestock Grazing

Livestock potentially compete for forage with Preble's and reduce the amount of cover available to Preble's. Grazing historically occurred in the project area and has been substantially reduced in the last ten years. Limited grazing still occurs on private parcels east and west of the project area on tributaries to East Plum Creek, and has the potential to occur on private parcels along the East Plum Creek corridor.

Habitat Degradation by Nonnative Plants

Douglas County has locally severe infestations of nonnative and noxious species, including diffuse knapweed (*Acosta diffusa*). Nonnative and noxious species do not pose a significant threat to Preble's habitat, but they may reduce the amount of desirable forage.

Designated Open Space

Habitat preserved in designated open space, including County Open Space, State Wildlife Areas, and State Parks, benefits the long-term survival sustainability of threatened and endangered species. The project site is bordered on the north, south, and east by designated Douglas County Open Space or Conservation Easement.

Conservation Measures

Conservation measures are elements of the proposed project that would be implemented to avoid and minimize adverse effects and further the recovery of Preble's. Conservation measures in the proposed project area include impact minimization and habitat preservation. The following objectives were established for mitigating the effects of the proposed project on Preble's and its habitat:

- Avoid and minimize adverse impacts on Preble's habitat to the maximum extent practicable within engineering requirements for the project.
- Preserve 58.11 acres of property outside of the project footprint in a permanent Conservation Easement, deed restriction, or management plan dedicated to conserving wildlife habitat values.
- Use retaining walls to minimize habitat disturbance and noise impacts on Preble's habitat.
- Use retaining wall, fencing, and signage to restrict humans from entering the riparian zone.
- Develop and implement best management practices (BMPs) that will minimize indirect effects (as described below).
- Develop and implement a restoration plan that will restore the temporarily disturbed areas within Preble's habitat to preconstruction conditions or better.
- Develop and implement an integrated weed management plan.
- Install orange barrier fencing around the perimeter of disturbance areas to prevent access to nearby areas not being disturbed during construction. A proposed equipment staging area has been designated in currently disturbed uplands, and construction access has been limited to existing areas of low-quality habitat as much as possible.
- Minimize impacts on the existing woody vegetation by pruning the aerial portions of trees and shrubs that hang over the project area or interfere with equipment, and trimming willows to ground level in temporarily impacted areas to promote regeneration of the root structure following construction.

Best Management Practices

Erosion-, stormwater-, and pollution-control BMPs would be implemented during construction to minimize indirect impacts on the stream channel and riparian and upland areas. Standard BMPs that would be implemented during construction include:

- Revegetating all temporarily disturbed areas with native seed mixes to avoid erosion.
- Trimming willows within the temporary access areas for access, but the willows would not be removed.
- Retaining topsoil from those areas where willows occur so that portions of the root mass can be salvaged.
- Installing sediment- and erosion-control devices, such as silt fence, to minimize surface runoff in disturbed areas.
- Locating equipment refueling and staging areas in upland areas away from wetlands and riparian areas.
- Placing biodegradable erosion-control blankets on newly seeded steep slopes to control erosion and promote vegetation establishment.

Compensatory Mitigation

The project proponent is working with the Town of Larkspur and private landowners to protect seven parcels of land totaling 58.11 acres (Figure 4). All seven parcels contain East Plum Creek and its associated high-quality habitat, characterized mostly by overall Preble's habitat with smaller amounts of foraging and security habitat. The 58.11 acres of high-quality riparian vegetation that provides overall, foraging, and security habitat would offset the 9.76 acres of habitat loss of mostly foraging habitat. These six parcels provide about 1.3 miles of continuous habitat and connect to Douglas County open space and existing conservation easements, totaling more than 4.5 miles of continuous stream channel and unfragmented habitat. Furthermore, protection of these seven parcels leaves just a small 0.3-mile gap of unprotected property between these 4.5 miles of habitat and another 21 miles of completely connected and protected habitat within the Greenland Ranch and other Douglas County open spaces. Protection of these seven parcels aligns with the goals and objectives of the 2016 Draft Preble's Meadow Jumping Mouse Recovery Plan by completing or expanding on the Douglas County large population identified in the plan.

Figure 4. Proposed Mitigation

In addition to placing deed restrictions on these properties that would prevent residential or commercial development into perpetuity, conservation measures such as managing noxious weeds per the Colorado Weed Management Act and limiting human access will be implemented, as described above. Parcels owned by the City of Larkspur would also be accessible to the Service or some designated third party acceptable to the Service and city for habitat and population monitoring.

Conclusion and Determination

The on-site and cumulative impacts of the Larkspur Travel Center commercial development and all associated construction and mitigation activities addressed in this BA would adversely impact Preble's and its habitat. The project would have no adverse impacts on other threatened and endangered species protected under the ESA. Approximately 9.76 acres of Preble's habitat would be impacted by the proposed project. The disturbed habitat represents a small fraction of the habitat available for Preble's in the East Plum Creek watershed; therefore, the direct and indirect effects are expected to be minor but discernable. The proposed project would result in no adverse modification of critical habitat.

The combination of avoidance, minimization, and conservation measures would reduce the potential for the incidental take of Preble's associated with the proposed project. The proposed mitigation would likely provide a net benefit to Preble's and other wildlife by protecting 1.3 miles of East Plum Creek as a travel corridor and protecting 58 acres of the East Plum Creek corridor as designated open space. The ability of the East Plum Creek riparian area to function as a Preble's travel corridor would be enhanced by instituting protective measures that buffer and minimize human impacts. Fencing to control human access will buffer the travel corridor and discourage human encroachment. Interpretive signage will explain the benefits of preserving wildlife habitat.

Based on the current project plans, including proposed conservation measures, ERO has preliminarily determined that the proposed project may affect, and is likely to adversely affect, Preble's and its habitat over the short term, and would likely have a negligible to minor adverse effect over the long term. Because of the lack of habitat in or near the project area, the proposed project would have no effect on other federally listed species (Table 2).

Table 2. Preliminary effects determination for federally threatened, endangered, and candidate species.

Species	Preliminary Conclusion
Canada lynx	No effect
Preble’s meadow jumping mouse	May affect, likely to adversely affect
Preble’s meadow jumping mouse critical habitat	No adverse modification
Interior least tern	No effect
Mexican spotted owl	No effect
Piping plover	No effect
Whooping crane	No effect
Pallid sturgeon	No effect
Pawnee montane skipper	No effect
Colorado butterfly plant	No effect
Ute ladies’-tresses orchid	No effect
Western prairie fringed orchid	No effect

References

- Andrews, R., and R. Righter. 1992. Colorado Birds. Denver Museum of Natural History. Denver. 442 pp.
- Armstrong, D. M., M. E. Bakeman, A. Deans, C. A. Meaney, and T. R. Ryon. 1997. Report on habitat findings of the Preble’s meadow jumping mouse. Boulder, Colorado. Report to the U.S. Fish and Wildlife Service and Colorado Division of Wildlife.
- Clark, T. W., and M. R. Stromberg. 1987. Mammals in Wyoming. University of Kansas, Museum of Natural History.
- Colorado Division of Wildlife (CDOW). 2006. Pocket Guide to Native Fish of Colorado’s Eastern Plains. Colorado Division of Wildlife, Denver, CO.
- Douglas County. 1998. Parks, Trails, and Open Space Master Plan. Prepared by Community Development Division. 100 Third Street, Suite 220, Castle Rock, CO 80104.
- Douglas County Planning Commission. 2014. Douglas County 2035 Comprehensive Master Pan. Adopted June 16. Available at: <http://www.douglas.co.us/documents/full-cmp.pdf>. Last accessed: December 8, 2016.
- ERO Resources Corporation (ERO). 2016. Natural Resources Assessment – Larkspur Truck Stop Property, Douglas County, Colorado. May 23.
- Fitzgerald, J. P., C. A. Meaney, and D. M. Armstrong. 1994. Mammals of Colorado. Denver Museum of Natural History and University Press of Colorado. 467 pp.
- Meaney, C. A., A. Deans, N. W. Clippenger, M. Rider, N. Daly, and M. O’Shea-Stone. 1997. Third year survey for Preble’s meadow jumping mouse (*Zapus hudsonius preblei*) in Colorado. Under contract to Colorado Division of Wildlife. Boulder, CO.
- NatureServe. 2010. NatureServe Explorer. Available at: <http://www.natureserve.org/explorer/servlet/NatureServe>.

- Proctor, B. 1998. Pawnee Montane Skipper Butterfly Recovery Plan. U.S. Fish and Wildlife Service Region 6, Denver, CO.
- Shenk, T. M., and M. M. Sivert. 1999. Movement patterns of the Preble's meadow jumping mouse as they vary across time and space. Colorado Division of Wildlife. Fort Collins, CO.
- Spackman, S., B. Jennings, J. Coles, C. Dawson, M. Minton, A. Kratz, and C. Spurrier. 1997. Colorado Rare Plant Field Guide. Prepared for the Bureau of Land Management, U.S. Forest Service, and U.S. Fish and Wildlife Service by the Colorado Natural Heritage Program.
- U.S. Fish and Wildlife Service (Service). 1992. Interim Survey Guidelines for *Spiranthes diluvialis* (Ute ladies'-tresses orchid). November 23.
- U.S. Fish and Wildlife Service (Service). 1995. Recovery Plan for the Mexican Spotted Owl. December.
- U.S. Fish and Wildlife Service (Service). 2004. Designation of Critical Habitat for the Colorado Butterfly Plant, proposed rule. Federal Register 50 CFR Part 17, August 6, 2004. Volume 69, No. 151. Pp. 47834–47861.
- U.S. Fish and Wildlife Service (Service). 2016. Endangered, Threatened, Proposed and Candidate Species, Colorado Counties. Available at: <http://ecos.fws.gov/ipac/>. Last accessed: October 1, 2016.
- U.S. Forest Service (USFS). 1997. Final environmental impact statement for Arapaho and Roosevelt National Forests and Pawnee National Grasslands. Fort Collins, CO.
- White, Gary C., and Tanya M. Shenk. 2000. Relationship of Preble's Meadow Jumping Mouse Densities to Vegetation Cover. Colorado Division of Wildlife Report.

Appendix A Agency Correspondence

Appendix B Construction Plan Set