

SMITH ENVIRONMENTAL AND ENGINEERING
Delivering Smart Solutions for Planning, Permitting, & Design

BIOLOGICAL ASSESSMENT FOR SEGMENT A
19734 HIGHWAY 105 IMPROVEMENTS

TAILS: 06E24000-2017-I-0242

EL PASO COUNTY, COLORADO



WWW.SMITHDELIVERS.COM

250 Perry Lane Dacono, CO 80514 phone: 720.887.4928 fax: 720.887.4680

BIOLOGICAL ASSESSMENT FOR SEGMENT A – 19734 HIGHWAY 105 IMPROVEMENTS
TAILS: 06E24000-2017-I-0242
EL PASO COUNTY, COLORADO

Prepared for:

US Fish and Wildlife Service
Colorado Ecological Services Field Office
134 Union Boulevard
Lakewood, CO 80228

and

Colorado Department of Transportation, Region 2
5615 Wills Boulevard
Pueblo, CO 81008

On behalf of:

El Paso County Department of Public Works
3275 Akers Drive
Colorado Springs, CO 80922

and

HDR Engineering, Inc.
5555 Tech Center Drive, Suite 310
Colorado Springs, CO 80919

Prepared by:

Smith Environmental and Engineering
250 Perry Lane
Dacono, Colorado 80514
(303) 551-7980

May 6, 2022

TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION	1
1.1 CONSULTATION HISTORY	1
1.2 ACTION AREA	1
1.3 PROPOSED ACTION	3
2.0 SPECIES/CRITICAL HABITAT CONSIDERED.....	4
2.1 FEDERALLY LISTED SPECIES CONSIDERED FOR THE PROPOSED ACTION.....	4
2.2 PREBLE’S MEADOW JUMPING MOUSE.....	5
2.2.1 Current Population.....	6
3.0 ENVIRONMENTAL BASELINE	8
3.1 HABITAT CONDITIONS	8
4.0 EFFECTS ANALYSIS.....	10
4.1 DIRECT EFFECTS.....	10
4.2 INDIRECT EFFECTS.....	11
5.0 CONSERVATION MEASURES.....	16
5.1 AVOIDANCE OF IMPACTS.....	16
5.2 MITIGATION	17
5.2.1 Habitat Restoration.....	17
5.2.2 Habitat Conservation.....	18
5.2.3 Habitat Enhancement	20
5.3 MONITORING PROGRAM AND SUCCESS CRITERIA.....	21
6.0 CONCLUSION AND DETERMINATION OF EFFECT	23
7.0 LITERATURE CITED.....	24

LIST OF FIGURES

Figure 1. Action Area 2
Figure 2. PMJM Habitat and Trapping Results 7
Figure 3. PMJM Habitat Impacts – Western Roadway 12
Figure 4. PMJM Habitat Impacts – Detention Pond 13
Figure 5. PMJM Habitat Impacts – Lake Woodmoor Drive 14
Figure 6. Mitigation Property 19
Figure 7. Proposed Enhancements..... 22

LIST OF TABLES

Table 1. Federally Listed Species Occurring in El Paso County, Colorado 4
Table 2. PMJM Habitat Ratings..... 9
Table 3. Impacts to PMJM Habitat 10
Table 4. Mitigation Requirements 17
Table 5. Mitigation Approach 17
Table 6. Seed Mix for PMJM Restoration..... 18

LIST OF APPENDICES

- APPENDIX A – PHOTOGRAPHS OF THE ACTION AREA
- APPENDIX B – PHOTOGRAPHS OF THE MITIGATION AREA
- APPENDIX C – DESIGN PLANS

1.0 INTRODUCTION

El Paso County (EPC), in coordination with the Colorado Department of Transportation (CDOT), is proposing to construct roadway improvements along approximately 4,700 ft of Highway 105 between the east I-25 off-ramp and Lake Woodmoor Drive (Proposed Action) in El Paso County, Colorado. Funding has been made available from the Federal Highway Administration (FHWA) and is being administered by CDOT. The purpose of this Biological Assessment (BA) is to evaluate the potential direct and indirect effects of the Proposed Action on listed and proposed threatened and endangered species and determine whether any such species or habitat are likely to be adversely affected by the Proposed Action.

1.1 CONSULTATION HISTORY

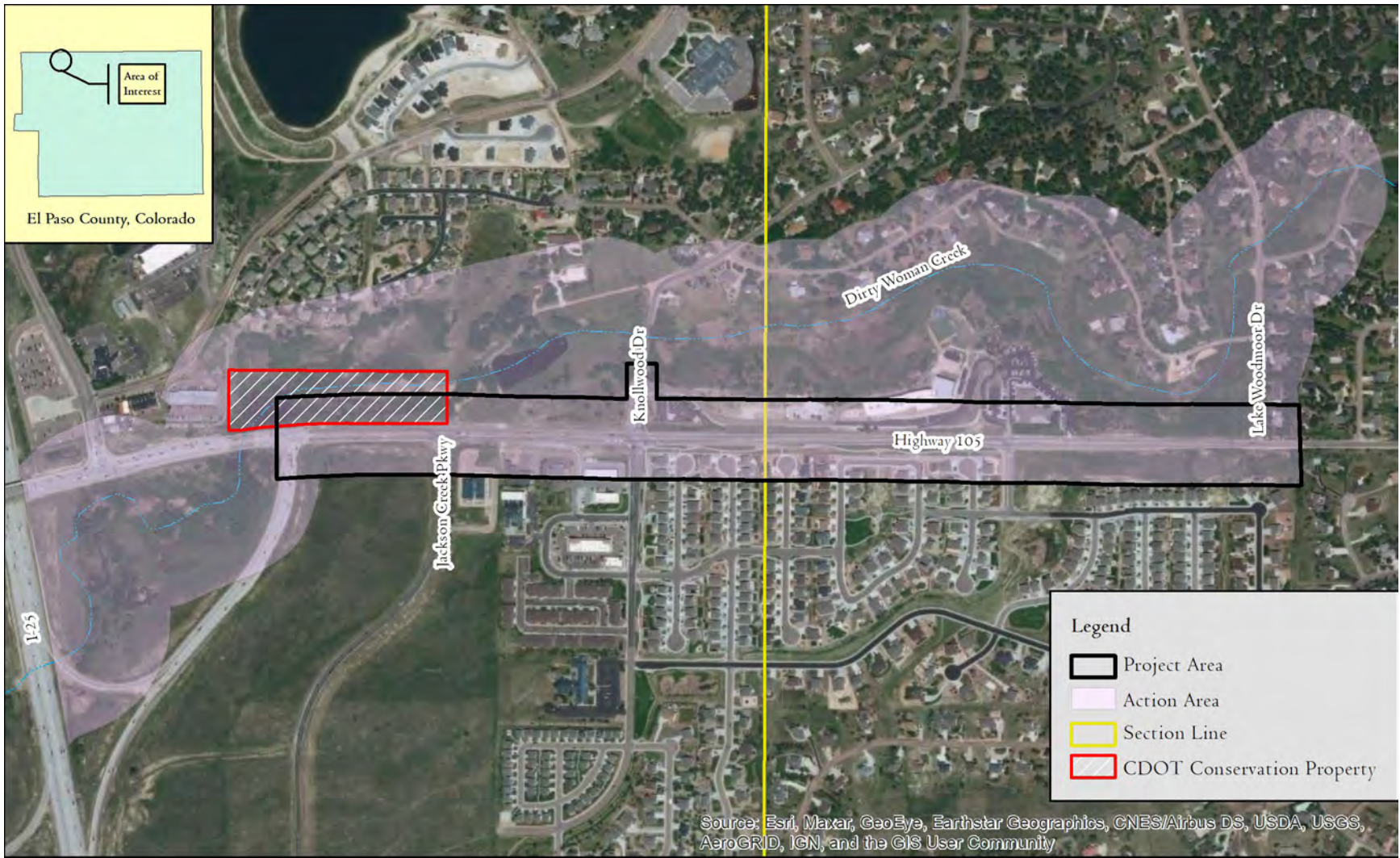
On December 7, 2016, CDOT submitted “Habitat Suitability Assessment for Federally and State-Listed Threatened and Endangered Species for Highway 105 from Woodmoor Drive to Lake Woodmoor Drive, El Paso County, Colorado” to Alison Deans Michael at the US Fish and Wildlife Service (USFWS). On January 10, 2017, an on-site meeting was held with representatives from the USFWS, CDOT, and HDR, the lead project engineer. Following this meeting, the consultation document was revised and resubmitted on January 17, 2017. A letter stating that the Proposed Action was not likely to adversely affect the Preble’s meadow jumping mouse (*Zapus hudsonius preblei*) (PMJM) was issued to CDOT on January 27, 2017.

The Proposed Action was not constructed as anticipated, and a series of delays resulted in the lapsing of the issued clearance letter from the USFWS. In 2021, Proposed Action planning resumed. A site visit between the USFWS, CDOT, EPC, HDR, and Smith Environmental and Engineering (SMITH) was held on November 17, 2021. At that meeting, it was determined that changes to the Proposed Action would require the preparation of a BA with appropriate compensatory mitigation.

1.2 ACTION AREA

For this BA, the terms Action Area and Project Area will be used. Per federal guidance, the Action Area is considered to be all areas affected directly or indirectly. This shall include the Project Area (described below), the adjacent Dirty Woman Creek floodplain, and the 100-meter floodplain buffer used to designate the limits of PMJM habitat (Figure 1). The Action Area does not extend west of I-25. The Project Area shall refer to the potential area of direct effects only. It extends 200 ft north and south of the existing centerline of Highway 105 between the east I-25 off-ramp and Lake Woodmoor Drive (Figure 1). This section of roadway is approximately one mile long and also encompasses the intersection of Knollwood Drive and Village Ridge Point.

The Action Area is located in El Paso County, Colorado just north of the city limits of the Town of Monument on the Monument Colorado USGS quadrangle. The Action Area passes through Sections 13 and 14 of Township 11 South, Range 67 West of the Sixth Principal Meridian. The center of the Action Area is located at 39.093 degrees north, 104.849 degrees west. The elevation in the Action Area ranges from 7,000 ft to 7,160 ft. While much of the Action Area occurs in CDOT and/or EPC right-of-way (ROW), acquisition from private landowners will be necessary. Notably, CDOT owns one parcel in the Action Area specifically for conservation of habitat for the PMJM (Figure 1).

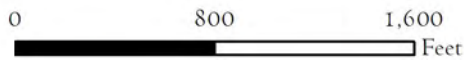


**SMITH ENVIRONMENTAL
AND ENGINEERING**

250 Perry Lane
Dacono, Colorado 80514
(720) 887-4928, (720) 887-4680 (fax)



HIGHWAY 105 - SEGMENT A



Legend

- Project Area
- Action Area
- Section Line
- CDOT Conservation Property

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 1
Action Area
El Paso County, Colorado
March 2022

1.3 PROPOSED ACTION

EPC is proposing to construct improvements along a nearly one mile stretch of Highway 105. The purpose of the Proposed Action is to improve safety and mobility along a vital transportation corridor within the El Paso County region. In the past two decades, the region has experienced significant growth, and the roadway has become increasingly congested. The Proposed Action will increase capacity, create safer conditions, and improve drainage. These improvements will consist primarily of road widening to accommodate two lanes of traffic in each direction, new sidewalks, and an additional acceleration lane. A roundabout is proposed at Knollwood Drive and Village Ridge Point. Stormwater upgrades are proposed throughout the corridor, and a water quality pond will be constructed on private property north of Highway 105 and west of Knollwood Drive with an outfall into Dirty Woman Creek. Retaining walls are proposed north of Highway 105 in the eastern extent of the Project Area to minimize impacts to private property, wetlands, and wildlife habitat. The preliminary design sheets can be found in Appendix C.

Construction for the Proposed Action is anticipated to take roughly 18 months starting around November 2022 and is anticipated to be completed by May 2024. Phasing will be confirmed by the selected contractor but it is anticipated to be done in two phases: westbound and eastbound. The westbound construction will be more involved as it includes two retaining walls and the roundabout on Knollwood Drive. The wall in front of the school and the roundabout will be part of the early action items to minimize conflict with school traffic and future school construction. The eastbound construction will follow and complete the construction.

After construction activities have been completed, disturbed areas will be revegetated using appropriate native seed mixes. Most areas will receive an upland seed mix, but a riparian/wetland mix will be used where appropriate. Additional details on post-construction restoration can be found in Section 5.2 and Appendix C.

2.0 SPECIES/CRITICAL HABITAT CONSIDERED

2.1 FEDERALLY LISTED SPECIES CONSIDERED FOR THE PROPOSED ACTION

The potential for occurrence of all federally listed threatened and endangered species that may occur in the Action Area or that could be directly or indirectly affected by the Proposed Action has been evaluated. Habitat for four of these species does not occur in El Paso County; however, water-related activities or use in the North Platte, South Platte and Laramie River Basins may affect downstream habitats for these species in Nebraska. The Proposed Action will not require water withdrawals from the South Platte River basin, and there will be no effect on the Piping Plover (*Charadrius melodus*), Whooping Crane (*Grus americana*), pallid sturgeon (*Oncorhynchus clarki stomias*), and western prairie fringed orchid (*Platanthera praeclara*). Table 1 discusses the species with potential to be affected by the Proposed Action and their habitat requirements. The PMJM is the only species that could be affected by the Proposed Action. Effects to PMJM and its habitat are discussed in detail in Section 2.2.

Table 1. Federally Listed Species Occurring in El Paso County, Colorado.

Species	Listing Status	Suitable Habitat
BIRDS		
Eastern Black Rail (<i>Laterallus jamaicensis</i> ssp. <i>jamaicensis</i>)	Threatened	The rail occurs in wetlands with dense overhead cover and soils that are moist to saturated interspersed with or adjacent to very shallow water. The rail is known primarily in southeastern Colorado, and breeding status within the state is unknown (Wickersham 2016). The Dirty Woman Creek corridor and associated wetlands could potentially support rails, but because they are not known to occur in the local area, the Proposed Action will have no effect on this species.
Mexican Spotted Owl, <i>Strix occidentalis lucida</i>	Threatened	Suitable habitat for the owl consists of old growth forests and rock outcrops in steep canyon areas. The Action Area does not provide suitable habitat conditions for the owl, and the Proposed Action will have no effect on this species.
FISH		
Greenback cutthroat trout, <i>Oncorhynchus clarki stomias</i>	Threatened	The greenback cutthroat trout is found in cold, clear, oxygenated streams of moderate gradient. Overhanging branches, undercut banks, and eddies behind rubble provide essential feeding and resting habitat. These conditions do not occur in the Action Area or in Dirty Woman Creek. Additionally, recent genetic analysis has shown that the only true population of the trout currently survives in Bear Creek west of Colorado Springs (Metcalf et al. 2012). The Proposed Action will have no effect on this species.
INSECTS		
Monarch butterfly (<i>Danaus plexippus</i>)	Candidate	In late 2020, the monarch butterfly was declined for formal listing under the ESA, but it remains a candidate subject to frequent status review. Monarchs undertake extensive migrations through North America and require milkweed (<i>Asclepias</i> spp.) plants for reproduction. The Proposed Action will occur in roadsides and

Species	Listing Status	Suitable Habitat
		maintained (i.e., mowed) upland areas that do not support milkweed. As such, the Proposed Action is not likely to jeopardize the continued existence of this species.
Pawnee montane skipper (<i>Hesperia leonardus montana</i>)	Threatened	The skipper occurs only in dry, open ponderosa pine woodlands with sparse understory at 6,000 to 7,500 ft. in portions of Jefferson, Douglas, Teller, and Park Counties. The skipper occurs only in the Pikes Peak Granite Formation in the South Platte River drainage system (Vaughan and Shepherd 2005). These conditions do not occur in the Action Area, and the Proposed Action will have no effect on this species.
MAMMALS		
Preble's meadow jumping mouse, <i>Zapus hudsonius preblei</i>	Threatened	Habitat for the mouse includes well-developed plains riparian vegetation with adjacent, undisturbed grasslands and a nearby water source. There is designated critical habitat downstream of the Action Area on Dirty Woman Creek, but minimal trapping has been conducted in this area (Figure 2). This species is discussed below.
PLANTS		
Ute ladies'-tresses orchid, <i>Spiranthes diluvialis</i>	Threatened	The orchid is known to occur in seasonally moist soils and wet meadows between 4,500 and 6,500 ft. The Action Area occurs above this elevation range, and there are no known populations within El Paso County. Additionally, the only historical record was poorly documented (CNHP 1997+). The Proposed Action will have no effect on this species.

2.2 PREBLE'S MEADOW JUMPING MOUSE

The PMJM is a small rodent with large hind feet adapted for jumping, a long bicolored tail, and a distinct dark stripe down the middle of its back bordered on either side by gray to orange-brown fur (Federal Register 1998). The PMJM lives and reproduces in and near riparian areas within grassland, shrubland, forest, and mixed vegetation types where dense herbaceous or woody vegetation occurs near the ground level. Open water must be available during their active season with ample upland areas of sufficient width and quality for foraging, hibernation, and refuge from flooding events (Federal Register 1998). Hydrologic regimes that support PMJM range from large perennial rivers to small drainages only three to 10 ft in width. Periodic flooding helps create a dense vegetative community by stimulating re-sprouting and allows herbs and grasses to take advantage of newly deposited soil.

PMJM usually enter hibernation in September or October and emerge the following May. PMJM are primarily nocturnal or crepuscular. They construct day nests of grasses, sedges, rushes, or other available plant material. Their nests are commonly found under debris at bases of shrubs and trees, or in open grasslands. An individual mouse can have multiple day nests in both riparian and grassland areas and may abandon a nest after approximately a week of use (Federal Register 2003).

The tolerance of PMJM concerning noxious weed species is not well understood. Whether or not noxious weeds reduce PMJM's persistence may be due in large part to whether they create a monoculture, thus out-competing and replacing native vegetation species.

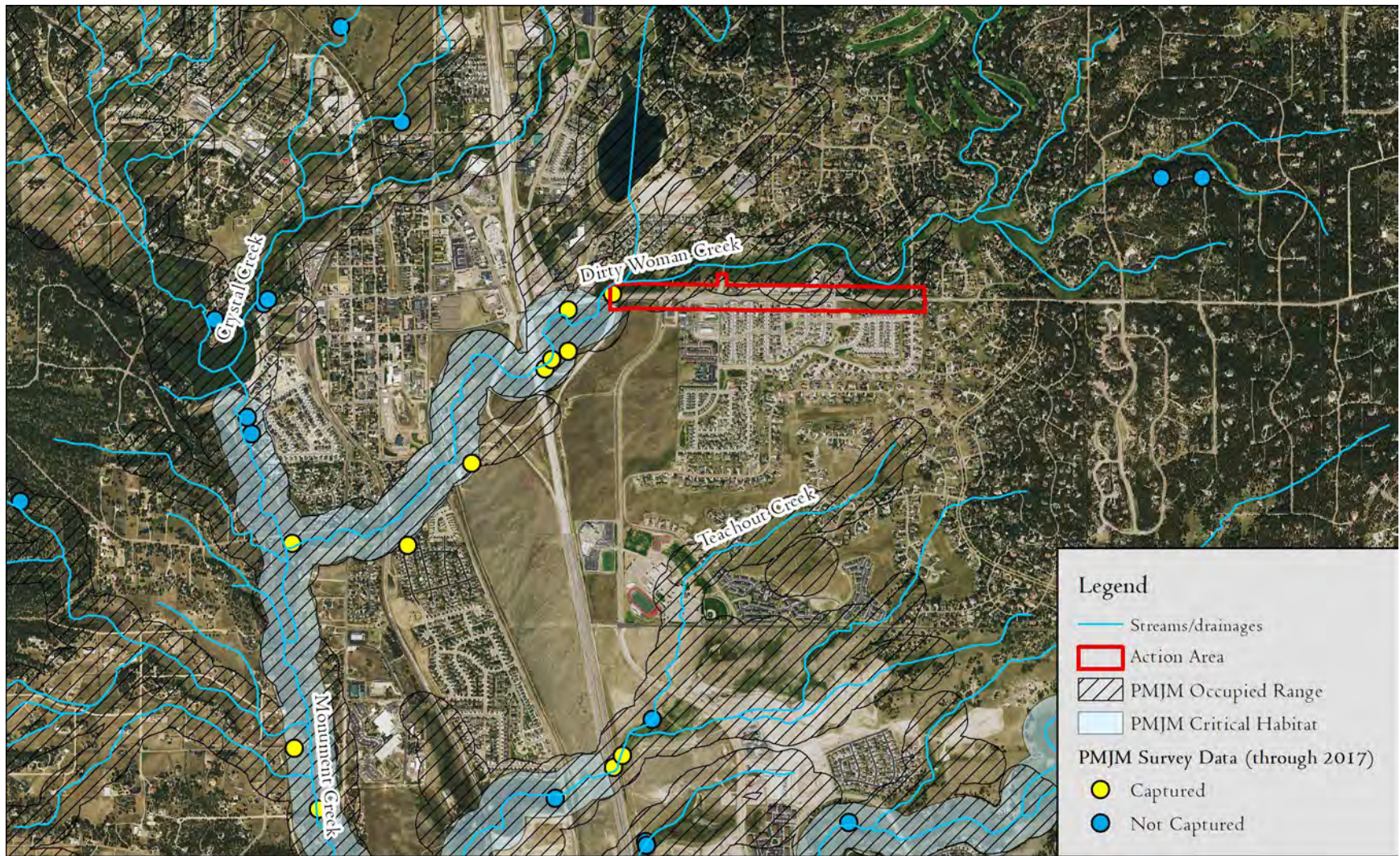
In Colorado, the distribution of the PMJM forms a band along the Front Range from Wyoming southward to El Paso County. The western boundary of their range in Colorado appears related to elevation along the Front Range. The USFWS uses 7,600 ft as the general upward limit of habitat in Colorado (Federal Register 2010).

The PMJM was listed as threatened by the USFWS in May 1998. Because PMJM have been shown to construct hibernacula and day nests beneath shrubs or dense forbs in upland areas (Shenk and Sivert 1999), the USFWS issued survey guidelines in 2004 recommending that projects occurring within 300 ft of the 100-year floodplain of rivers and creeks be assessed for their potential impact on PMJM habitat and subsequent populations.

In 2010, the USFWS issued a final rule designating eleven riparian corridors in Colorado as Critical Habitat for the PMJM (Federal Register 2010). A small part of the Action Area occurs within Unit 11, Monument Creek, which falls within the Fountain Creek Hydrological Unit Code designated from the Recovery Plan (Figure 2, USFWS 2018). Unit 11 includes Monument Creek from the dam at Monument Lake downstream to the northern boundary of the United States Air Force Academy. The Proposed Action will not impact this Critical Habitat area, but impacts to upstream areas will occur.

2.2.1 Current Population

Trapping for the PMJM along Dirty Woman Creek and Monument Creek occurred primarily in the late 1990s and early 2000s (Figure 2). The majority of the captures in this area occurred on CDOT property at the western edge of the Action Area; this area represents the edge of the designated Critical Habitat area on Dirty Woman Creek. Several other captures have been recorded along Monument Creek below Monument Lake, which is also designated as Critical Habitat. Minimal trapping has been conducted upstream along Dirty Woman Creek, likely due to the presence of mostly private property. Furthermore, only one trapping effort has been conducted in this area in the last 15 years.



SMITH ENVIRONMENTAL AND ENGINEERING

250 Perry Lane
 Dacono, Colorado 80514
 (720) 887-4928, (720) 887-4680 (fax)



HIGHWAY 105 - SEGMENT A

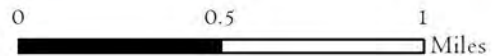


Figure 2
PMJM Habitat and Trapping Results
 El Paso County, Colorado
 March 2022

3.0 ENVIRONMENTAL BASELINE

The topography within the Action Area rises from west to east as Highway 105 approaches the northern extent of the pine forests of the Black Forest area. The elevation in the Action Area ranges from a low point of approximately 7,000 ft near Dirty Woman Creek to 7,160 ft. Dirty Woman Creek flows beneath Highway 105 near I-25, but otherwise flows primarily north of the Project Area. In the eastern extent near Lake Woodmoor Drive, it bends south again. No other drainages are located within the Action Area.

The Action Area consists primarily of Highway 105 and associated ROW and developed areas, including private homes, businesses, a church, and a school. Vegetation is present along the roadsides, in landscaped areas, and in the undeveloped areas. Landscaped areas consist mostly of turf grasses that are mowed frequently, and coniferous and deciduous ornamental trees. The roadside areas consist mostly of upland grasses, including smooth brome (*Bromus inermis*) and blue grama (*Bouteloua gracilis*), and forbs. There are a few areas where wetlands consisting almost exclusively of cattails (*Typha* spp.) occur adjacent to the road.

The vegetation within the undeveloped parcels is strongly influenced by the presence (or absence) of a water source. Wetland and riparian vegetation are abundant along Dirty Woman Creek. Wetlands were delineated and are characterized as Palustrine Emergent (PEM), Palustrine Scrub-Shrub (PSS), and Palustrine Forested (PFO) (SMITH 2021). Species identified include narrowleaf cottonwood (*Populus angustifolia*), sandbar willow (*Salix exigua*), Nebraska sedge (*Carex nebrascensis*), Canada thistle (*Cirsium arvense*), fringed willowherb (*Epilobium ciliatum*), arctic rush (*Juncus arcticus*), wild mint (*Mentha arvensis*), knotweed (*Polygonum persicaria*) and cattails. The undeveloped areas that do not occur near Dirty Woman Creek are primarily grassland areas, though some areas have patches of Gambel oak (*Quercus gambelii*).

The Natural Resources Conservation Service (NRCS) has mapped soils throughout the Action Area. Within the floodplain areas, soils are mapped as Alamosa loam, and the upland areas are Tomah-Crowfoot loamy sands (NRCS 2021). Alamosa loams are poorly drained floodplain soils, while Tomah-Crowfoot soils are well drained hillslope soils. Alamosa loams are hydric soils, and Tomah-Crowfoot soils can include minor components of hydric soils that can support wetlands. However, it should be noted that the NRCS does not delineate soil map units smaller than 7-10 acres; actual soil types within the narrow construction easements may vary.

3.1 HABITAT CONDITIONS

As described in Table 1, habitat for the PMJM includes well-developed plains riparian vegetation with adjacent, undisturbed grasslands and a nearby water source. The Project Area generally does not include all of these elements, but the wider Action Area does encompass more suitable habitat conditions. For purposes of assessing the condition of PMJM habitat within the Action Area, the Action Area has been divided into three categories based on current and proposed land use: the road ROW, the private parcel where the water quality pond is proposed, and the overall Action Area (Appendix C). The specific impacts to these areas will be discussed in Section 4.0, but it is valuable to assess the present condition of these areas as it relates to the PMJM.

A habitat scorecard developed and used by the USFWS (2020a) was used to quantify PMJM habitat within the two use areas and Action Area at large (Table 2). This rating system assigns a value between 0 and 4 to key PMJM habitat elements. The resulting scores can be used to determine what elements are relatively intact and valuable to the species and what elements can be targeted for improvement.

The ROW area, which encompasses designated ROW as well as adjacent areas where disturbance will occur related to sidewalk and roadway expansion, is mostly upland but does include some riparian elements. The ROW experiences significant disturbance, and while there is decent vegetative cover, a significant proportion is nonnative or invasive. The water quality pond is proposed on a property that is currently in private ownership; it has a mowed grass understory with spaced pine trees and minimal shrub growth. It is also entirely located in an upland and therefore was not scored for riparian elements. The scores for these proposed disturbance areas can be compared to the score for the overall Action Area, which generally exhibits more structural diversity and vegetative cover. The final column of Table 2 contains the scores for a property that is proposed as mitigation; this area will be discussed in Section 5.0, but it is included here as a basis for comparison.

Table 2. PMJM Habitat Ratings

Habitat Element	Score by Site*			
	Impact Area ROW	Impact Area Pond	Action Area (overall)	Mitigation Property
<i>Riparian Areas</i>				
Shrub cover	1	-	3	3
Grass and forb cover	3	-	3	3
Shrub vigor	3	-	4	4
Structural layers	2	-	3	3
Invasive species	1	-	0	0
Vegetation diversity	4	-	4	4
Hydrology	1	-	1	1
<i>Upland Areas</i>				
Vegetative cover	3	4	4	4
Invasive species	1	0	0	0
<i>General Conditions</i>				
Disturbance	1	2	2	2
Total Score	20	6	24	24
Average Score	2	2	2.4	2.4
	Fair	Fair	Fair-Good	Fair-Good

*Scores are assigned on a scale of 0-4 based on parameters defined by the USFWS. 0 = None, 1 = Poor, 2 = Fair, 3 = Good, and 4 = Optimal.

4.0 EFFECTS ANALYSIS

4.1 DIRECT EFFECTS

Direct effects are caused by or will result from, and occur contemporaneously with, the Proposed Action (50 CFR §402.02). Five elements of the Proposed Action will occur in the vicinity of Dirty Woman Creek, and therefore may impact the PMJM. The USFWS has defined PMJM habitat as 100 m (328 ft) on both sides of the 100-year floodplain of applicable streams (USFWS 2018). The CPW mapped occupied range (Figure 2) reflects this definition, and therefore it was used to calculate impacts for the Proposed Action. Developed areas, disturbed shoulders, and roads were excluded from habitat calculations. Calculations are based on current available design; final impacts may vary, and the USFWS will be notified of any changes to impact quantities. Effects are summarized in Table 3 and described in detail below; activities are presented approximately west to east as they occur in the Action Area, but some overlapping activities will occur.

Table 3. Impacts to PMJM Habitat

Activity	Permanent Impacts (ac)	Temporary Impacts (ac)	Total
Highway 105 Sidewalk/Road Widening (west end)	0.00	0.21	0.21
Pond Overflow Channel and Outfall	0.16	0.23	0.39
Water Quality Pond and Access Road	1.22	0.21	1.43
Knollwood Round-about	0.11	0.40	0.51
Lake Woodmoor Retaining Wall/Road Widening (east end)	0.26	0.70	0.96
Total	1.75	1.75	3.50

One of the key elements of the Proposed Action is the widening of the roadway and the installation of sidewalks to replace existing, informal footpaths. The limits of disturbance for the roadway and sidewalk expansion will intersect PMJM habitat in two main areas: at the western end within the existing Highway 105 right-of-way (Figure 3) and the eastern end near Lake Woodmoor Drive (Figure 5, discussed in more detail below). The roadside vegetation consists of mowed grasses and weedy shrub, and the existing footpath area has been trampled and consists of exposed bare ground. Vegetation beyond the existing fence is more robust, but the Proposed Action has been designed to avoid impacts to the CDOT conservation property.

The water quality pond, access road, overflow channel, and outfall will result in the greatest extent of impacts for the Proposed Action. These features will be located on the Maguire property near the intersection of Knollwood Drive and Highway 105 (Figures 3 and 4). The Maguire property occurs in an upland area that consists of mostly blue grama grass and spaced ponderosa pine (*Pinus ponderosa*) trees. Although the species composition is primarily native species, the landowner mows the area, decreasing its overall quality for use by the PMJM. At the request of the landowner, the water quality pond has been shifted west from its original location closer to the intersection. As such, a maintenance road will be constructed to provide access from Knollwood Drive. The overflow channel and outfall were designed to remain entirely on the Maguire property, thus avoiding additional impacts to the CDOT conservation property. As the overflow channel approaches the outfall, it widens and flattens to reduce flow velocity, and a riprap check dam at the outfall will further reduce flow velocity and provide sediment and debris collection prior to discharging to Dirty Woman Creek.

East of the Maguire property, the existing intersection of Knollwood Drive and Village Ridge Point will be replaced with a roundabout (Figure 4). Most of the disturbance associated with the roundabout will occur in the ROW, but some vegetated areas will be impacted along the western edge of the roadway. Additionally, a stormwater pipe and outfall will be replaced on the northeast edge of the roundabout. Grasses and forbs, including many weedy species, are dominant in the ROW, though there are some Gambel oak shrubs and sandbar willows on the fringe of the Dirty Woman Creek riparian area that will be impacted. These shrub areas beyond the ROW provide moderate quality habitat as refuge, but disturbance levels here are still currently very high.

As mentioned above, there will be impacts to PMJM habitat at the eastern edge of the Project Area where Dirty Woman Creek curves back to the south towards Highway 105. A broad floodplain area with both wetland and upland grassland vegetation is located northwest of the intersection of Highway 105 and Lake Woodmoor Drive (Figure 5). The Proposed Action will widen Highway 105 in this location to accommodate a right turn/westbound lane. To minimize impacts to PMJM habitat and the wetlands, the Proposed Action will construct a retaining wall along the north side of Highway 105 rather than filling and grading. The wall will be approximately 500 ft long and will be located behind the guardrail along Highway 105. The highest quality habitat in this area is located outside of the limits of disturbance, near the creek channel, and will not be impacted by the wall design.

There are also turn lanes proposed along Lake Woodmoor Drive, extending approximately 400 ft north of Highway 105 (Figure 5). The widening to accommodate the new lanes will be completed by grading the slope, because an extension of the retaining wall was cost prohibitive. However, the roadside embankment and shoulder ROW experiences frequent disturbance, and the mouse would be less likely to occur in these highly disturbed areas. The slope is proposed to be no steeper than 3:1, and most of the habitat impact in this area will be temporary as the area is revegetated.

Lastly, the existing stormwater crossing culvert at the Lake Woodmoor and Highway 105 intersection will be replaced with a network of pipes and manholes to carry the stormwater runoff under Highway 105 and north along Lake Woodmoor Drive. The storm network will outfall to an area lined with riprap to protect the soil surface against erosion and scour. Habitat and wetland habitat impacts in this location will be minimized by placing the drainage network adjacent to the roadway, and ultimately, much of this property is proposed for preservation and will be discussed in Section 5.0.

4.2 INDIRECT EFFECTS

Indirect effects are caused by or result from the proposed agency action, are later in time, and are reasonably certain to occur (50 CFR §402.02). With transportation projects, a common indirect effect can be the facilitation of and access to new areas for land use change and development. This is not a significant concern along this segment of Highway 105, as nearly all developable land has been developed. CDOT owns and maintains one of the larger undeveloped parcels specifically for habitat conservation, and the regulatory floodplain associated with Dirty Woman Creek prevents development of many of the higher quality PMJM habitat areas upstream. The Proposed Action will remove some areas from the pool of potentially developable space, with the construction of the water quality pond west of Knollwood Drive and the establishment of a PMJM mitigation area at Lake Woodmoor Drive.

Figure 3. PMJM Habitat Impacts – Western Roadway.

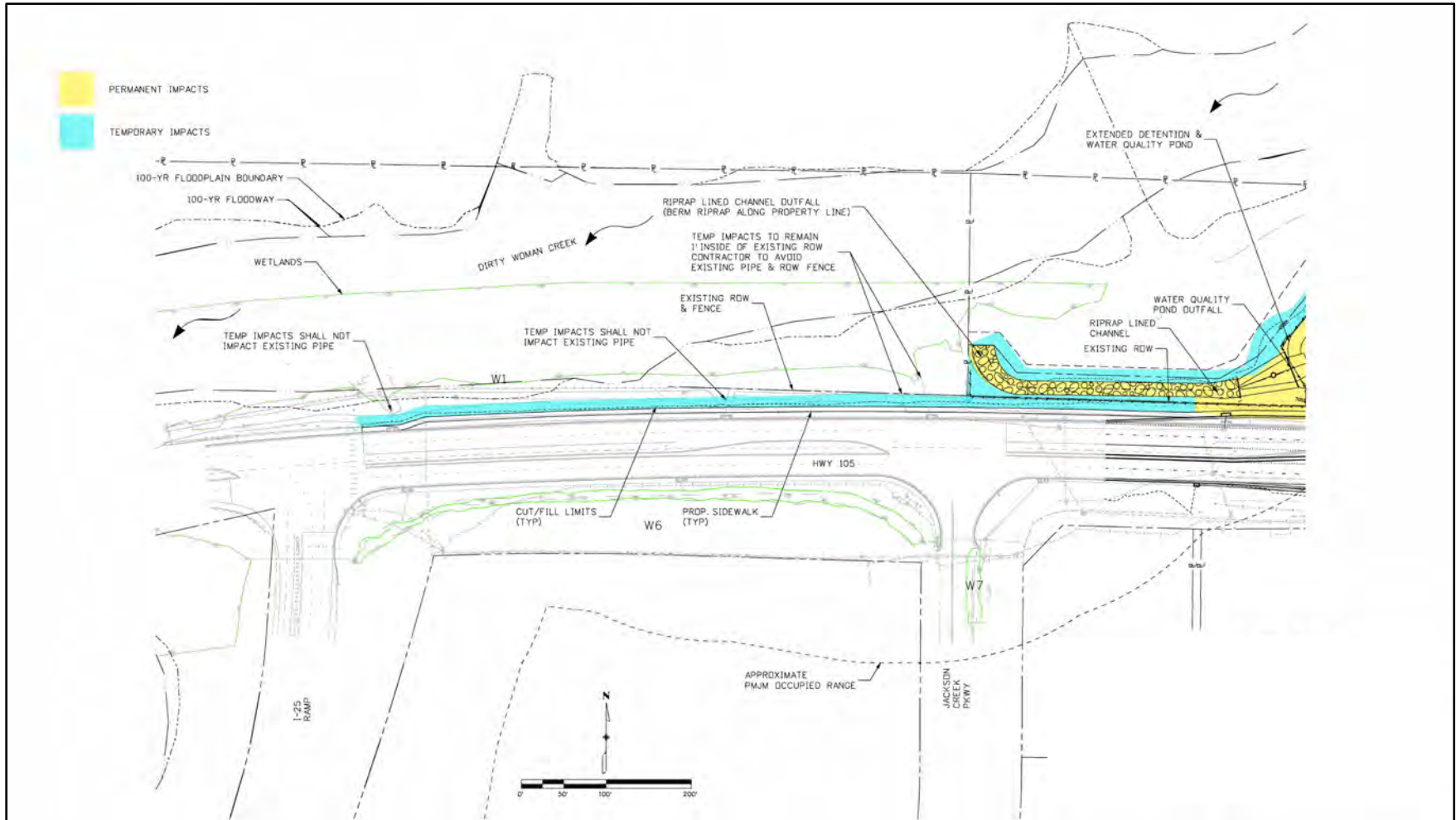


Figure 4. PMJM Habitat Impacts – Detention Pond.

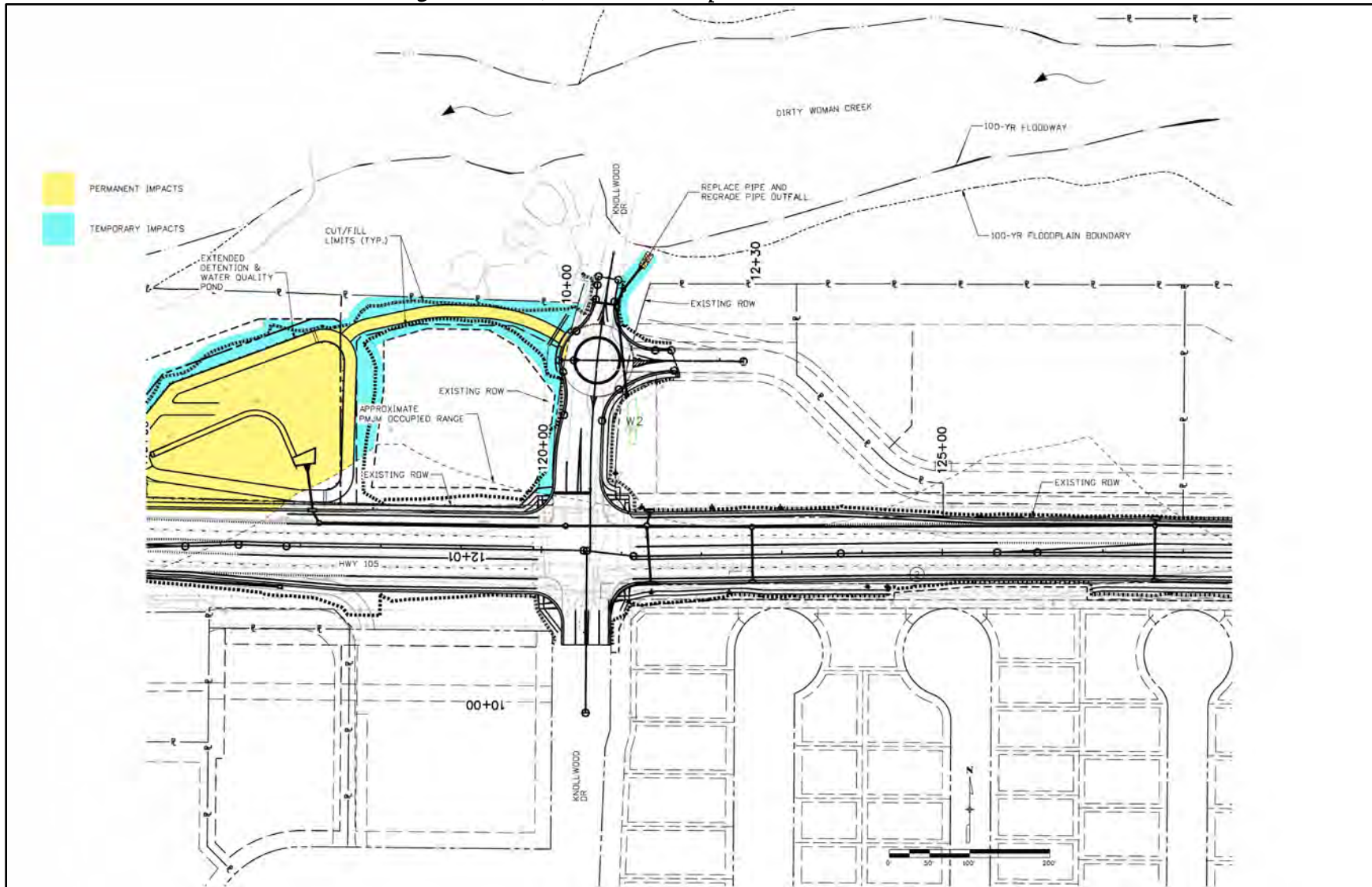
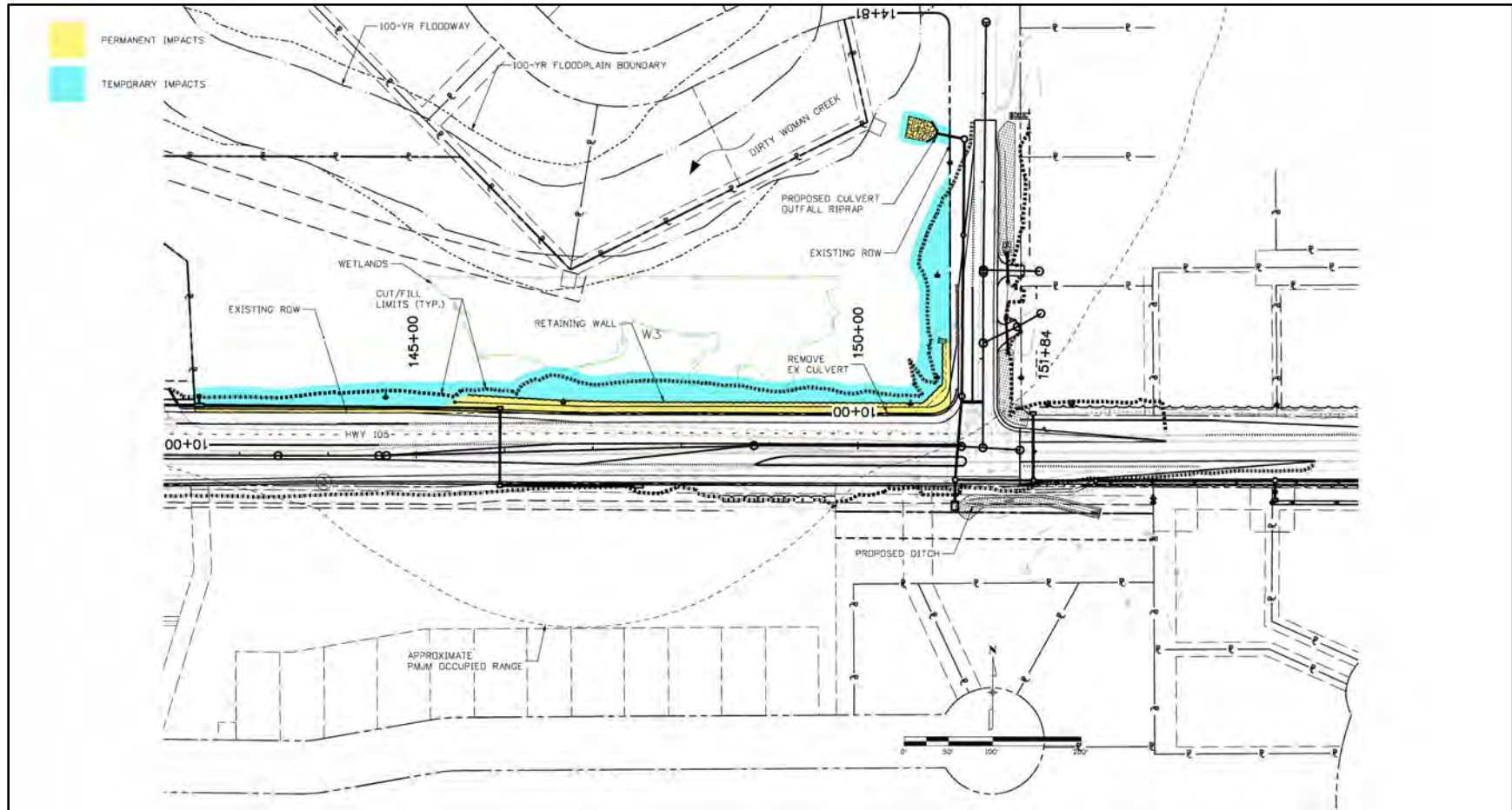


Figure 5. PMJM Habitat Impacts – Lake Woodmoor Drive



The most significant potential for indirect effects from the Proposed Action derives from the increase in impervious surface from widened roadways and sidewalk installations. Stormwater runoff from such surfaces can degrade downstream water bodies by carrying pollutants and sediments and by elevating waterbody temperatures as a product of heat transfer from warmer, urban surfaces. Additionally, stormwater flows, if not managed properly, can yield “flash” flows when runoff that historically would have infiltrated into the soil or spread throughout a floodplain is channeled into drains that ultimately outfall into natural features. Such flows, especially if sediment-laden, contribute to stream channel erosion and subsequent degradation of the riparian habitats upon which the PMJM relies.

Because there is designated critical habitat for the PMJM immediately downstream of the Project Area, effective stormwater management was a key element of the Proposed Action. The water quality pond (discussed above) will serve to slow the “flash” flows associated with storm events and will allow for sediment settling that will significantly reduce downstream scour. The overflow channel that outfalls to the Dirty Woman Creek riparian corridor will only convey flows during 100- year flow events and is lined with riprap to reduce the erosive force of the conveyed flows. The outfall of the culvert at the east end of the Project Area has been similarly designed to reduce the energy of the flow and significantly reduce potential erosion prior to its entry to Dirty Woman Creek.

Lastly, the Proposed Action will be operating under a Colorado Discharge Permit System – Construction Stormwater Discharge Permit (CDPS-SDP) issued through the Colorado Department of Public Health and Environment (CDPHE) and an Erosion and Stormwater Quality Control Permit (ESQCP) issued through EPC that will require design, installation, and maintenance of stormwater management BMPs during construction. The temporary BMPs employed during construction and the permanent water quality infrastructure are sufficient to prevent degradation of downstream habitat for the PMJM.

5.0 CONSERVATION MEASURES

5.1 AVOIDANCE OF IMPACTS

During design of the Proposed Action, a process that has been ongoing since 2011, two significant actions were taken to minimize impacts to PMJM habitat. The outfall for the water quality pond was originally located on the CDOT conservation property but was subsequently relocated to avoid that sensitive area. After additional discussions with CDOT, all permanent and temporary impacts were removed from the CDOT conservation property. Additionally, the retaining wall near Lake Woodmoor Drive was incorporated to substantially minimize the impacts that would have resulted from grading the slope. The wall will create a visual and noise barrier between the roadway and the habitat area, maintaining some seclusion, and discouraging people from entering the area.

Additionally, SMITH and the project team have incorporated the following conservation measures as recommended by the USFWS (2020b):

- Riprap will be buried with soil and seeded with native riparian vegetation.
- The number and footprint of access routes, staging areas, and work areas has been minimized.
- Limits of work fencing, signage, or other visible markers will be used to delineate access routes and work areas and to enforce no-entry zones.
- A preconstruction briefing for onsite personnel will be held to explain the limits of work and other conservation measures.
- The Proposed Action will follow regional stormwater management guidelines and has designed best management practices (BMPs) to control contamination, erosion, and sedimentation during and after construction.
- Utilities will remain along the existing road corridors.
- In vegetated areas that will be impacted during the active season (approximately May 1-October 31), vegetation will be clipped or mowed to ground level one to two weeks prior to initiation of construction to discourage PMJM use. For work that will occur during the hibernation season (approximately November 1 – April 31), shrubs that could provide hibernacula will be removed no later than October to discourage mice from hibernating in future work zones.
- Access routes will consist of constructed vehicle tracking pads to protect roots and the seed bank. Geotextiles or other materials will line the route, which will then be filled with rock or other acceptable material. All materials will be removed upon project completion, and the disturbed areas will be fully restored.
- Areas where equipment will be stored, staged, and refueled will be stabilized and protected by BMPs and a spill protection plan.
- Excavated material, trash and debris will be stored and stockpiled outside the riparian corridor and protected from stream flows or runoff.
- Wildlife-proof garbage containers will be used, and/or waste will be promptly removed to avoid attracting predators.
- Work site lighting will be restricted to the hibernation season (November 1 to April 30). Any temporary lighting installed will use downcast LED full-cutoff fixtures that comply with the International Dark-Sky Association's recommendations for outdoor illumination. Shielding and directing of lighting will be used to minimize light spill off the site.

- Only weed-free certified materials, including topsoil, seed, and mulch will be used.
- Construction activities will be completed in an area before restoration or enhancement activities are initiated in that area.
- All work will stop and the USFWS will be contacted immediately if a PMJM is found alive, dead, injured, or hibernating within the Action Area.

5.2 MITIGATION

Per the USFWS, permanent impacts will be mitigated at a 2:1 ratio, and temporary impacts will be mitigated at a 1.5:1 ratio. This is summarized in Table 4.

Table 4. Mitigation Requirements

Impact Category	Impact Quantity (ac)	Ratio	Required Mitigation (ac)
Permanent	1.75	2:1	3.500
Temporary	1.75	1.5:1	2.625
Total	3.50		6.125

This required mitigation will be achieved through restoration, enhancement, and permanent protection of habitat across multiple properties. First, all temporary impacts will be fully restored in-situ, which will encompass 1.75 acres and achieve a 1:1 mitigation ratio for temporary impacts. The remaining 4.375 acres of required mitigation will consist of permanent habitat protection and enhancement measures conducted on a property that is currently in private ownership but will be acquired by EPC and protected from future development or other land uses. The proposed mitigation activities are described below.

Table 5. Mitigation Approach

Activity	Quantity (ac)
In-situ restoration of temporary impacts	1.750
Conservation and enhancement of mitigation property	4.375
Total	6.125

5.2.1 Habitat Restoration

Once construction is complete, all temporarily disturbed habitat areas (1.75 acres) will be revegetated using the weed-free seed mix shown in Table 6. The wheat and oats included in the upland mix are intended to provide a quick-growing, annual cover crop while the natives establish. The seeds will be a sterile variety to prevent long-term establishment. Seed beds will be disked or raked prior to seeding, and tackifiers, straw, or wood mulch will be applied as needed to boost moisture holding capacity and minimize the risk of seed loss from wind.

Table 6. Seed Mix for PMJM Restoration

Common Name	Scientific Name	Growth Form	Pounds PLS/ac
Sideoats grama	<i>Bouteloua curtipendula</i> var. Vaughn	Grass	2.0

Blue grama	<i>Bouteloua gracilis</i> var. Hachita	Grass	1.5
Little bluestem	<i>Schizachyrium scoparium</i> var. Pastura	Grass	3.0
Western wheatgrass	<i>Pascopyrum smithii</i> var. Arriba	Grass	5.0
Green needlegrass	<i>Stipa viridula</i>	Grass	2.0
Junegrass	<i>Koeleria macrantha</i>	Grass	0.3
Indiangrass	<i>Sorghastrum nutans</i> var. Holt	Grass	3.0
Switch grass	<i>Panicum virgatum</i> v. Nebraska 28	Grass	2.0
Smooth aster	<i>Symphotrichum laeve</i>	Forb	0.1
Purple prairie clover	<i>Dalea purpurea</i>	Forb	0.5
Blanketflower	<i>Gaillardia aristata</i>	Forb	1.0
Blue flax	<i>Linum lewisii</i>	Forb	1.0
Woods' rose	<i>Rosa woodsii</i>	Shrub	1.0
Rabbitbrush	<i>Ericameria nauseosa</i>	Shrub	0.1
Threelaf sumac	<i>Rhus trilobata</i>	Shrub	0.5
Snowberry	<i>Symphoricarpos albus</i>	Shrub	0.5
Chokecherry	<i>Prunus virginiana</i>	Shrub	0.5
Winter wheat (sterile)	<i>Triticum aestivum</i>	Grass - Cover	3.0
Common oat (sterile)	<i>Avena sativa</i>	Grass - Cover	3.0
		Total	30.0

Mechanical and chemical weed management will occur according to CDOT specifications. Herbicides used will be approved by CDOT for use in riparian areas; additional information will be included in the final design set and construction specifications. Weed management will occur in the spring and fall of each year following project completion until the revegetation criteria (discussed below) are met.

5.2.2 Habitat Conservation

The proposed mitigation property (“the property”) is located northwest of the intersection of Highway 105 and Lake Woodmoor Drive (Figure 6). Portions of the property will be impacted by the Proposed Action as described in Section 4.0 above, but the majority of the property will not be disturbed. The property is currently in private ownership, but due to the presence of Dirty Woman Creek and the associated floodplain, it is largely undevelopable.

The property provides habitat for the PMJM and connectivity with downstream habitat areas, including the CDOT conservation parcel and designated critical habitat. It also includes a diversity of habitat types, with riparian vegetation dominated by willows (*Salix* spp.) along the creek corridor, grassland and wet meadow areas extending to the southeast toward the intersection, and upland tree and shrub-dominated areas on the hillside extending towards the church on the adjacent property (Figure 6). This represents a broader diversity of habitat elements than the areas being impacted by the Proposed Action, as the Project Area consists predominantly of grassed roadsides and upland areas. Furthermore, the proposed mitigation property also represents higher habitat quality than those areas being



SMITH ENVIRONMENTAL AND ENGINEERING

250 Perry Lane
 Dacono, Colorado 80514
 (720) 887-4928, (720) 887-4680 (fax)



HIGHWAY 105 - SEGMENT A

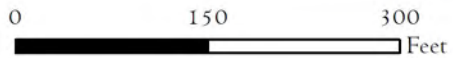


Figure 6
Mitigation Property
 El Paso County, Colorado
 March 2022

impacted. As shown in Table 2, this area has an average habitat score in the Fair to Good range, due largely to the presence and vigor of the shrubs in the riparian corridor.

Protection of the proposed mitigation property would occur through acquisition of the parcel (or a portion with sufficient acreage) by EPC and the placement of deed restrictions on the property or other requested mechanism to prevent future development or uses incompatible to the wellbeing of the PMJM. Recreational uses associated with parks or open lands accessible to the public would not be permitted. The property could be placed into a conservation easement, if necessary, though the easement holder would likely occur at the discretion of EPC. EPC is not permitted to both hold a conservation easement and own the property the conservation easement is on. Once initial environmental clearances have been approved by CDOT, EPC will be allowed to enter into right-of-way and land acquisition negotiations, and the preservation mechanism will be finalized.

The protection of this property provides a unique mitigation opportunity to protect habitat that is not just in the same county or watershed; it is adjacent to the same intermittent drainage and occurs within the Action Area. This would likely have direct, beneficial effects on the same PMJM populations that may be disrupted or displaced by the Proposed Action. Not all mitigation efforts are able to provide this level of in-situ benefit.

5.2.3 Habitat Enhancement

Conserving the mitigation property will protect the habitat area from future development or land use change, but it will have little effect on habitat condition over time without active enhancement actions. As shown in Table 2, the mitigation property currently ranges between a Fair and Good habitat area. The goal of enhancement would be to specifically target lower scores to improve the overall quality of the habitat area to Good or even Optimal. Three habitat enhancement actions – weed management, supplemental vegetation, and trail closure – are proposed to elevate the condition of the habitat without causing significant disturbance to the functioning habitat elements that already exist.

The lowest scores pertain to the hydrologic condition of Dirty Woman Creek as an intermittent water body, which cannot be changed, and noxious weeds. As a private property, it is not currently subject to a noxious weed management plan, and it does not appear to have been managed in recent years. There is a substantial population of Canada thistle, and knapweed (*Centaurea* spp.), common mullein (*Verbascum thapsus*), and common teasel (*Dipsacus fullonum*) were also observed. As such, the development and implementation of a noxious weed management plan is recommended. For the first 3-5 years following project completion, the area will be aggressively managed with mechanical removals and targeted herbicide applications in the spring and fall by a licensed applicator with the Colorado Department of Agriculture. If the monitoring program (discussed below) indicates that success criteria have been achieved, weed management responsibilities will be transferred to the El Paso County weed management program for properties under their jurisdiction.

In general, the structural diversity within the mitigation property is good; there are willows along the creek, grasses and forbs in the adjacent meadow, and Gambel oak and ponderosa pine along the slope. However, incorporating additional shrub species in the grassland area will provide more habitat for PMJM day nests and hibernacula. In the upland areas, golden currant (*Ribes aureum*) and skunkbrush sumac (*Rhus trilobata*) are recommended (Figure 7). Both species are adapted to local conditions and

are known to provide habitat for the PMJM (USFWS 2018). Twenty shrubs (5-gallon size) will be planted in the upland areas, configured in clumps of 2-3 plants with approximately 5-foot spacing between individual plants. Caging may be utilized on planted shrubs to provide protection during establishment from ungulate grazers in the riparian corridor. Temporary supplemental irrigation of the planted shrubs may also be necessary during establishment.

Presently, an informal trail extends the length of the mitigation parcel, from the church parking lot on the west end to Woodmoor Drive on the east end (Figure 7). Since the current roadway network completely lacks sidewalks in this area, this path was a logical connection between the neighborhoods to the north and east and the school and church to the west. Any action to permanently remove (via grading) or permanently formalize this trail would constitute a significant disturbance to the existing habitat, but continued (or potentially increased) human activity in the area is detrimental to the goals of minimizing noxious weeds and reducing disturbance. Therefore, we are proposing a soft or passive trail closure that would utilize signage describing the property's status as habitat for a threatened species and its closure to the public. The signage should make clear that pets are not allowed in the area to protect native wildlife; it may even be beneficial to direct pet owners to local trails or off-leash areas.

At present, fencing is not proposed for the mitigation property, because even specifically designed "wildlife-friendly fencing" acts as a barrier to wildlife movement and contributes to landscape fragmentation. Such fencing is more frequently used in areas where wildlife movements are being directed away from roadways or other dangerous areas, and this need has not been identified in this section of the Highway 105 corridor. However, if the USFWS considers fencing of the property to be an important element of the mitigation effort, it will be incorporated into the site plan.

5.3 MONITORING PROGRAM AND SUCCESS CRITERIA

In the proposed mitigation areas, habitat success will be defined as: 1) obtaining at least 60% cover by shrubs and/or grasses, or a net increase of 30% cover; 2) at least 70% of the cover is native (planted) species; and less than 10% cover by state-listed noxious weeds.

All mitigation areas (restoration and enhancement) will be monitored annually by a qualified ecologist until the success criteria have been achieved and approved by the USFWS. Photo points and transects will be established, and vegetative cover will be evaluated using the point-intercept method at the end of every growing season. The location where quantitative cover evaluations are completed will be photographically documented from the established photo points. Monitoring reports will be submitted to the USFWS annually until the mitigation success criteria have been achieved.

If the monitoring results indicate that the mitigation areas are not on a trajectory to achieve the success criteria, adaptive management techniques should be implemented to identify the source of the failure and develop practicable solutions. Replacement plantings, supplemental irrigation, and wildlife exclusionary devices are some tools that may be utilized as needed. Annual monitoring and reporting will continue until success criteria are met, and then management of the site will be facilitated by El Paso County. Long-term maintenance activities will be minimized to reduce habitat disturbance; the ultimate goal is to promote a self-sustaining mitigation area that requires minimal intervention.



**SMITH ENVIRONMENTAL
AND ENGINEERING**

250 Perry Lane
Dacono, Colorado 80514
(720) 887-4928, (720) 887-4680 (fax)



HIGHWAY 105 - SEGMENT A

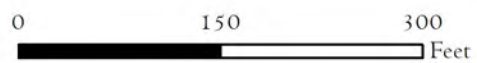


Figure 7
Proposed Enhancements
El Paso County, Colorado
March 2022

6.0 CONCLUSION AND DETERMINATION OF EFFECT

The Proposed Action may affect and is likely to adversely affect the PMJM and its habitat. The Proposed Action will permanently impact 1.75 acres and temporarily impact 1.75 acres of habitat for the PMJM within the Action Area. Most of the impacts will occur in upland areas within the Dirty Woman Creek floodplain and in the Highway 105 ROW. None of the impact areas are located within designated Critical Habitat for the PMJM. Conservation measures will be incorporated into the Proposed Action including avoidance and minimization of impacts, restoration of native vegetation in temporary impact areas, and treatment of noxious weeds. El Paso County intends to purchase a 5.79-acre parcel within the Action Area to fulfill the remaining mitigation requirements. If this parcel is not successfully acquired, El Paso County will purchase a comparable site in this HUC designated as critical habitat. The acquired property will be placed in permanent protection, likely via a deed restriction or other requested mechanism. Additionally, the area will be enhanced through noxious weed management, supplemental vegetation plantings, and the closing of an informal trail through the property. With the addition of this mitigation site, the appropriate mitigation to disturbance ratios will be achieved. The mitigation areas will be monitored for at least three years or until success criteria are achieved.

7.0 LITERATURE CITED

- CNHHP [Colorado Natural Heritage Program]. 1997+. Colorado Rare Plant Guide. Available at: <https://cnhp.colostate.edu/rareplants/>. Latest update: August 30, 2019.
- Federal Register. 1998. Vol. 63, No. 92. Final Rule to List the Preble's Meadow Jumping Mouse as a Threatened Species. Wednesday, May 13, 1998.
- Federal Register. 2003. Vol 68, No. 120. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*), Final Rule. Monday, June 23, 2003.
- Federal Register. 2010. Vol. 75, No. 240. Revised Critical Habitat for the Preble's Meadow Jumping Mouse in Colorado; Final Rule. Wednesday, December 15, 2010.
- Metcalf, J. L., Love Stowell, S., Kennedy, C. M., Rogers, K. B., McDonald, D., Epp, J., Keepers, K., Cooper, A., Austin, J. J. and Martin, A. P. 2012. Historical stocking data and 19th century DNA reveal human-induced changes to native diversity and distribution of cutthroat trout. *Molecular Ecology* 21:21, pp. 5194-5207.
- NRCS. 2021. United States Department of Agriculture, Web Soil Survey. Available online at <http://websoilsurvey.nrcs.usda.gov/>. Accessed December 21, 2021.
- Shenk, T.M. and M.M. Sivert. 1999. Movement Patterns of Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*) as they Vary Across Time and Space. Colorado Division of Wildlife January-March 1999 Quarterly Report.
- SMITH. 2021. Waters of the US Report, Highway 105 - Segment A, El Paso County, Colorado. Prepared for HDR, El Paso County, and CDOT. December 9, 2021.
- USFWS. 2018. Preble's Meadow Jumping Mouse Recovery Plan. Region 6, Lakewood, Colorado. Available online at: <https://www.fws.gov/mountain-prairie/es/species/mammals/preble/RECOVERY%20PLAN/Sept2018FinalRecoveryPlan.pdf>. Accessed January 21, 2019.
- USFWS. 2020a. Draft – Preble's optimal habitat worksheet. Colorado Ecological Services Field Office. December 17, 2020.
- USFWS. 2020b. Recommended Conservation Measures – Preble's Meadow Jumping Mouse. Colorado Ecological Services Field Office, Denver, CO.
- Vaughan, D. M., and M. D. Shepherd. 2005. Species Profile: *Hesperia leonardus montana*. Red List of Pollinator Insects of North America. The Xerces Society for Invertebrate Conservation. Portland.
- Wickersham, L.E., Editor. 2016. The Second Colorado Breeding Bird Atlas. Colorado Bird Atlas Partnership, Co-published by Colorado Parks and Wildlife, Denver, Colorado.

APPENDIX A – PHOTOGRAPHS OF THE ACTION AREA



Photo 1. View looking west along the ROW adjacent to the CDOT conservation property, which is located to the right of the barbed wire fence. The disturbance along the roadside is evident.



Photo 2. View looking north at the CDOT conservation property at the approximate location of an existing outfall which will be improved.



Photo 3. View looking west across the field where the pond outlet channel will be located. The large trees show the location of Dirty Woman Creek where the outfall will be located.



Photo 4. View looking east at the approximate location of the proposed detention pond on the Maguire property.



Photo 5. View looking west at the approximate alignment of the proposed access road for the pond.



Photo 6. View looking north at the Knollwood Drive roundabout and stormwater outfall.



Photo 7. View looking east along the north side of Highway 105 at the location of the proposed retaining wall. The habitat to the north of the wall be protected.



Photo 8. View looking south along Lake Woodmoor Drive toward Highway 105.

APPENDIX B – PHOTOGRAPHS OF THE MITIGATION AREA



Photo 1. View looking southwest along the existing informal trail.



Photo 2. An area within the mitigation property that is densely vegetated with Canada thistle, a state-listed noxious weed.



Photo 3. An area within the mitigation property (just west of Lake Woodmoor Drive) that exhibits little structural diversity. Selective shrub plantings are proposed in this area.



Photo 4. View looking east across portion of the mitigation property that exhibits dense shrub cover.



Photo 5. View looking east across the mitigation parcel.



Photo 6. View looking west across the mitigation parcel.

APPENDIX C – DESIGN PLANS