DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS ALBUQUERQUE DISTRICT REGULATORY DIVISION
SOUTHERN COLORADO BRANCH, FORT CARSON OFFICE
6082 MCGRATH, BLDG 1359
FORT CARSON, CO 80913

January 14, 2025

Regulatory Division

SUBJECT: Nationwide Permit Verification (SPA-2024-00474)

El Paso County-Dept. of Public Works
Attn: John Lantz
3275 Akers Drv
Colorado Springs, CO 80922
JohnLantz@elpasoco.com

Dear Mr. Lantz:

We are responding to your preconstruction notification (PCN), dated December 2, 2024, submitted to us for verification of authorization under Nationwide Permit (NWP) for the North Gate/Struthers Permanent Water Quality Pond project. The project site is located on Air Force Academy Property within Smith Creek and adjacent wetlands immediately south of North Gate Blvd and between the north and south bound lanes of Interstate-25 (I-25) at Latitude 39.0261, Longitude -104.8337; Section 12, Township 12 South, Range 67 West; Colorado Springs, El Paso County, Colorado.

Based on the information provided, we have determined that the North Gate/Struthers Permanent Water Quality Pond project involves the discharge of dredged or fill material into waters of the United States, subject to Section 404 of the Clean Water Act. The specific activity that requires Department of Army authorization is the construction of a stormwater outfall and associated rock riprap apron. The project will permanently impact approximately 169-square feet of streambed below the ordinary high-water mark (OHWM) of Smith Creek, temporarily impact approximately 402-square feet of streambed below the OHWM of Smith Creek, and temporarily impact approximately 202-square feet of wetlands adjacent to Smith Creek and will be conducted as described in the referenced PCN.

We have determined that activities associated with the project are authorized by 2021 NWP–43, Stormwater Management Facilities. A summary of this NWP and the Colorado Regional Conditions are available on our website at www.spa.usace.army.mil/reg/nwp. Failure to comply with all terms and conditions of this NWP may result in the suspension or revocation of this authorization. As required by General Condition 30, you shall sign the enclosed Compliance Certification (Enclosure 1) and return it to this office within 30 days after completion of the authorized work. For specific information regarding compliance with water quality certification (WQC) requirements, please refer to our website at www.spa.usace.army.mil/reg/wqc. In addition, the work must comply with the following **special condition:**

1. This Corps permit does not authorize you to take an endangered species, in particular Prebble's meadow jumping mouse (Zapus hudsonius preblei). In order to legally take a listed species, you must have separate authorization under the Endangered Species Act (ESA) (e.g., an ESA Section 10 permit, or a Biological Opinion (BO) under ESA Section 7, with "incidental take" provisions with which you must comply). The enclosed U.S. Fish and Wildlife Service (USFWS) BO (Project Code: 2023-0010148, dated May 5, 2023), contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that is also specified in the BO. Your authorization under this Corps permit is conditional upon your compliance with all of the mandatory terms and conditions associated with "incidental take" of the attached BO, which terms and conditions are incorporated by reference in this permit. Failure to comply with the terms and conditions associated with incidental take of the BO, where a take of the listed species occurs, would constitute an unauthorized take, and it would also constitute non-compliance with your Corps permit. The USFWS and/or the NMFS is/are the appropriate authority to determine compliance with the terms and conditions of its/their BO, and with the ESA.

Our review of this project also addressed its effects on threatened and endangered species and historic properties in accordance with General Conditions 18 and 20. The lead federal agency for the project is the U.S. Air Force Academy (USAFA). The lead federal agency has determined that this project is *likely to adversely affect* the Prebble's meadow jumping mouse (*Zapus hudsonius preblei*) and would have *no effect* to all other listed species. As a result, USFWS issued a BO which included an incidental take statement. Additionally, the USAFA determined the project will have *no adverse effect* to historic properties. The Corps concurs with these effect determinations. However, these determinations may be invalidated if the project is not completed as authorized or you did not provide accurate information in your PCN.

This permit verification is valid until March 14, 2026, unless the NWP is modified, suspended, reissued, or revoked prior to that date. Continued confirmation that an activity complies with the terms and conditions, and any changes to the NWP, is the responsibility of the permittee. Activities that have commenced, or are under contract to commence, in reliance on an NWP will remain authorized provided the activity is completed within 12 months of the date of the NWP's expiration, modification, or revocation.

This letter does not constitute approval of the project design features, nor does it imply that the construction is adequate for its intended purpose. This permit does not authorize any injury to property or invasion of rights or any infringement of federal, state, local, or tribal laws or regulations. The permittee and/or any contractors acting on behalf

of the permittee must possess the authority and any other approvals required by law, including property rights, to undertake the proposed work.

The landowner must allow Department of Army representatives to inspect the authorized activity at any time deemed necessary to ensure that it is being, or has been, accomplished in accordance with the terms and conditions of the permit.

We would appreciate your feedback on this permit action including your interaction with our staff or suggestions for improving our program. For more information about our program or to complete our Regulatory Program national customer service survey, visit our website at https://www.spa.usace.army.mil/Missions/Regulatory-Program-and-Permits/.

Please refer to identification number SPA-2024-00474 in any correspondence concerning this project. If you have any questions, please contact me by email at Daniel.i.Delgado@usace.army.mil, or telephone at (505) 231-4187.

Sincerely,

Daniel Delgado
Senior Project Manager

Enclosure

cc:
Tim DeMasters, CORVUS Environmental Consulting, tdemasters@CORVUSenv.com
Brian Mihlbachler, U.S. Air Force Academy, brian.mihlbachler@us.af.mil

COMPLIANCE CERTIFICATION

Action Number: SPA-2024-00474

Name of Permittee: El Paso County-Dept. of Public Works, Attn: John Lantz

Permit: NWP–43, Stormwater Management Facilities

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the following address:

U.S. Army Corps of Engineers, Albuquerque District
Regulatory Division-Fort Carson Office
PO BOX 12611
Colorado Springs, CO 80902

OR

Daniel.i.Delgado@usace.army.mil

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with this permit, you are subject to permit suspension, modification, or revocation.

Please enclose photographs showing the completed project.

I hereby certify that the work authorized by the above-referenced permit has been completed in accordance with the terms and conditions of the said permit, and required mitigation was completed in accordance with the permit conditions.

Date Work Started _____

Date Work Completed _____

_____ _____
Signature of Permittee Date

Encl 1

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Mountain-Prairie Region
134 Union Blvd, Suite 670
Lakewood, Colorado 80228-1807

IN REPLY REFER TO:
FWS/R6/ES

Project code: 2023-0010148

May 5, 2023

Brian Mihlbachler
U.S. Fish and Wildlife Service/US Air Force Academy Natural Resources Lead
8120 Edgerton Drive, Suite 40
USAF Academy, Colorado 80840

Dear Brian Mihlbachler:

The U.S. Fish and Wildlife Service (Service) received your request for formal consultation and biological assessment on March 29, 2023, regarding the North Gate/Struthers Permanent Water Quality (PWQ) Pond Project (project) in El Paso County, Colorado. The project proponent is El Paso County (County), and the project area is located on property owned by the U.S. Air Force Academy (USAFA) on land that is managed by the Colorado Department of Transportation (CDOT) through an easement. USAFA is the lead federal agency for the project which will also require a Clean Water Act section 404 permit for impacts to regulated wetlands and/or waters of the U.S. The purpose of the project is to construct a permanent water quality pond, storm collection network, and a regional extended detention basin at the Interstate 25 (I-25)/North Gate Boulevard (Blvd) interchange (Exit 156), at the northern end of the City of Colorado Springs. Your email initiated formal consultation for the federally threatened Preble's meadow jumping mouse (*Zapus hudsonius preblei*) (Preble's mouse) and determined that the proposed project is likely to adversely affect the species. The limits of disturbance do not extend into designated critical habitat; therefore, none will be affected.

This letter transmits our biological opinion regarding the proposed project in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq*.) and the Interagency Cooperative Regulations (50 CFR 402).

In this biological opinion, we find that the proposed project may affect the Preble's mouse and that the actions carried out pursuant to the proposed project are not expected to jeopardize the continued existence of the species. We base this biological opinion on the October 25, 2022, biological assessment prepared by CORVUS Environmental Consulting, LLC (CORVUS), as well as any additional clarifying correspondence.

Consultation History

Events relating to the consultation history for this formal consultation are as follows:

- On June 29, 2020, we (Kristin Salamack) attended a virtual meeting in which the project was introduced.

- On August 4, 2020, we met at the project site with Dr. Brian Mihlbachler (Service/USAFA), Jennifer McCorkle (USAFA), and CORVUS to discuss potential impacts, habitat quality, mitigation options and mitigation ratios.

- On December 7, 2021, CORVUS and Dr. Mihlbachler discussed the state of the current USAFA and Service Preble's mouse Habitat Restoration Conservation Agreement which was set to expire in 2020 but was extended pending an updated agreement and biological opinion which is currently in progress.

- On December 29, 2022, we received a draft of the biological assessment.

- On March 29, 2023, we received your final biological assessment and request for formal consultation.

- On April 10, 2023, we received additional, clarifying information from our review of the biological assessment.

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BIOLOGICAL OPINION

1. DESCRIPTION OF THE PROPOSED ACTION

El Paso County is proposing to construct a permanent water quality (PWQ) pond, storm network, and extended detention basin (EDB) that would convey surface runoff from approximately 55 acres in a network of underground pipes and inlets that would outfall into the proposed 12 acre-feet EDB. The EDB is intended to serve as a regional water quality and detention basin. The project would include nearly 3,000 linear feet of underground concrete pipe and would provide storm network connections to the existing subdivisions in the area. The EDB would be dry in normal conditions and would hold and slowly release stormwater for up to 48 hours following precipitation events. Proposed construction activities include grading, temporary access to stream outfall, riprap spillway construction, and construction of access roadways, forebay, detention basin, and trickle channel.

Most of the proposed action consists of underground pipes; however, the portion of the project that would be visible would be the EDB contained within the I-25 median. Most of the EDB would be located within the USAFA-designated Preble's Mouse Conservation Zone. Water discharged from the EDB would be piped underground to Smith Creek near its culvert that carries water westward under I-25 toward its confluence with Monument Creek.

The EDB would collect sediments from incoming stormwater and would be designed to have a sinuous, non-engineered look to be harmonious with the existing natural setting. The County would construct gravel roads for EDB access and maintenance (e.g., haul away sediments). Equipment would access the project area directly from North Gate Blvd. and a staging area would be located within the median in upland grasslands, outside of riparian habitat (Figure 1).

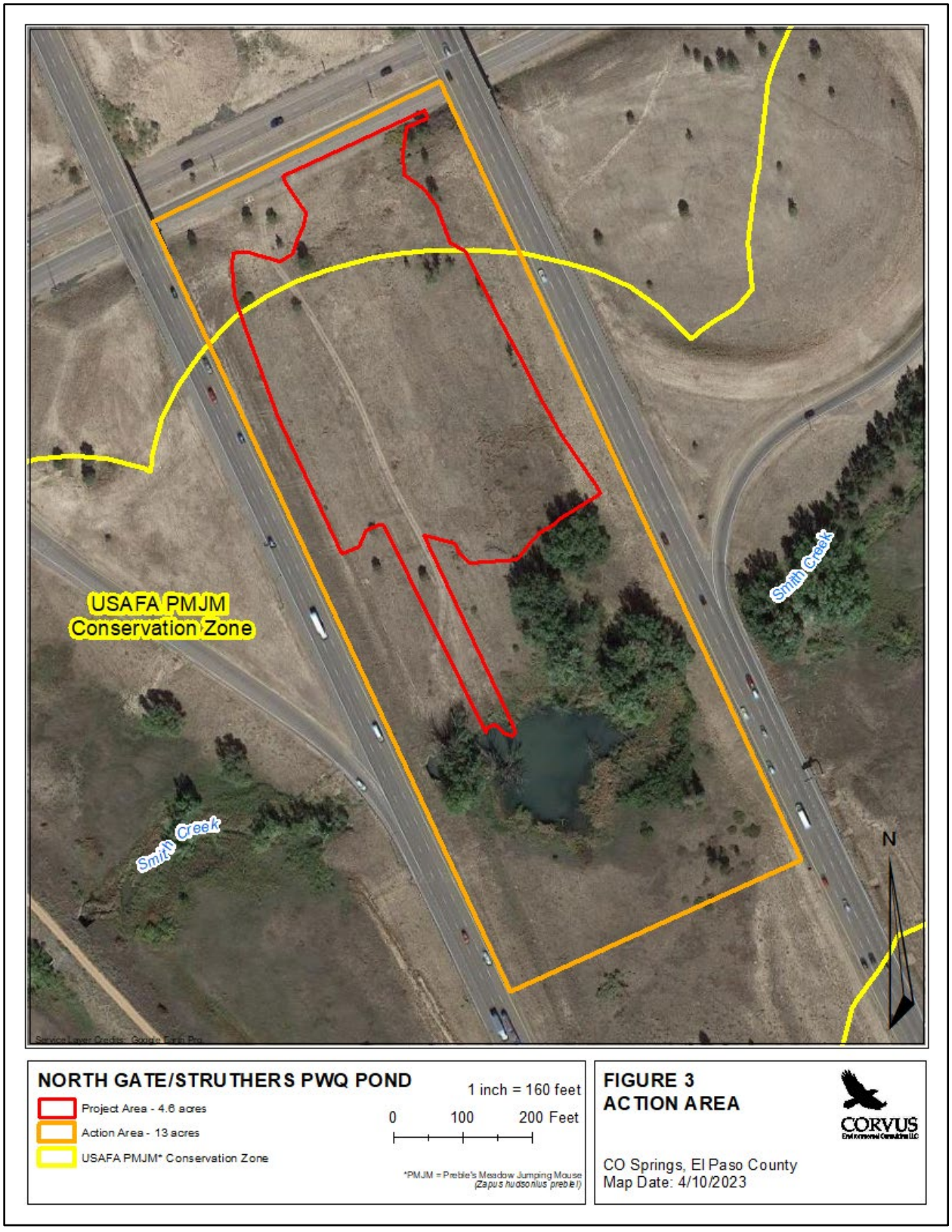

Figure 1. North Gate/Struthers PWQ Pond Project Area and Action Area, Colorado Springs, Colorado.

1.1. Mitigation

The project will mitigate for temporary and permanent impacts within habitat mapped as low-quality uplands at a 1:1 ratio while habitat mapped as high-quality riparian will be mitigated at a 1.5:1 ratio for temporary impacts and a 2:1 ratio for permanent impacts. This will result in a total of 3.54 acres of mitigation (Table 1).

Impacts to Preble's mouse habitat will be mitigated by restoring and enhancing disturbed habitat via native seeding, containerized plantings of shrubs and forbs, or willow staking. Mitigation for permanent impacts will occur within the action area to restore Preble's mouse habitat near areas that would be directly disturbed by the project (Figure 2). Mitigation for temporary impacts includes habitat restoration and enhancement to 1.66 acres of low-quality Preble's mouse habitat and 0.01 acre of high-quality Preble's habitat (total of 1.67 acres) in-place where disturbance occurs within the project area. Onsite mitigation for permanent impacts is proposed along Smith Creek within the action area and includes habitat restoration and enhancement to offset 1.87 acres of low-quality Preble's mouse habitat (Figure 3).

Table 1. Proposed Habitat Mitigation for the North Gate/Struthers PWQ Pond Project.

	Temporary Impacts		**Permanent Impacts**		
Preble's mouse Habitat Type	**Low-quality (Uplands)**	**High-quality (Riparian)**	**Low-quality (Uplands)**	**High-quality (Riparian)**	**Total (acres)**
Impact Acreage	1.66	0.01	1.87	0	**3.54**
Proposed Mitigation Ratio (N:1)	1:1	1.5:1	1:1	2:1	-
Adjusted Mitigation Acreage[1]	1.66	0.02	1.87	0	**3.55**
Acres Restored In-Place[2]	1.66	0.01	0	0	**1.67**
Mitigation Needed in Addition to In-Place Mitigation[3]	*0*	*0.01*	*1.87*	*0*	***1.88***

[1]Adjusted mitigation acreage is the updated acreage after applying the mitigation ratio.
[2]Restore in place (restoration) is the area that will be restored/revegetated in the project area once construction and temporary impacts are completed. This will result in no long-term loss of function to Preble's mouse habitat after successful completion.
[3]Mitigation that would not occur in-pace for temporary impacts. This mitigation is proposed to be within the action area.

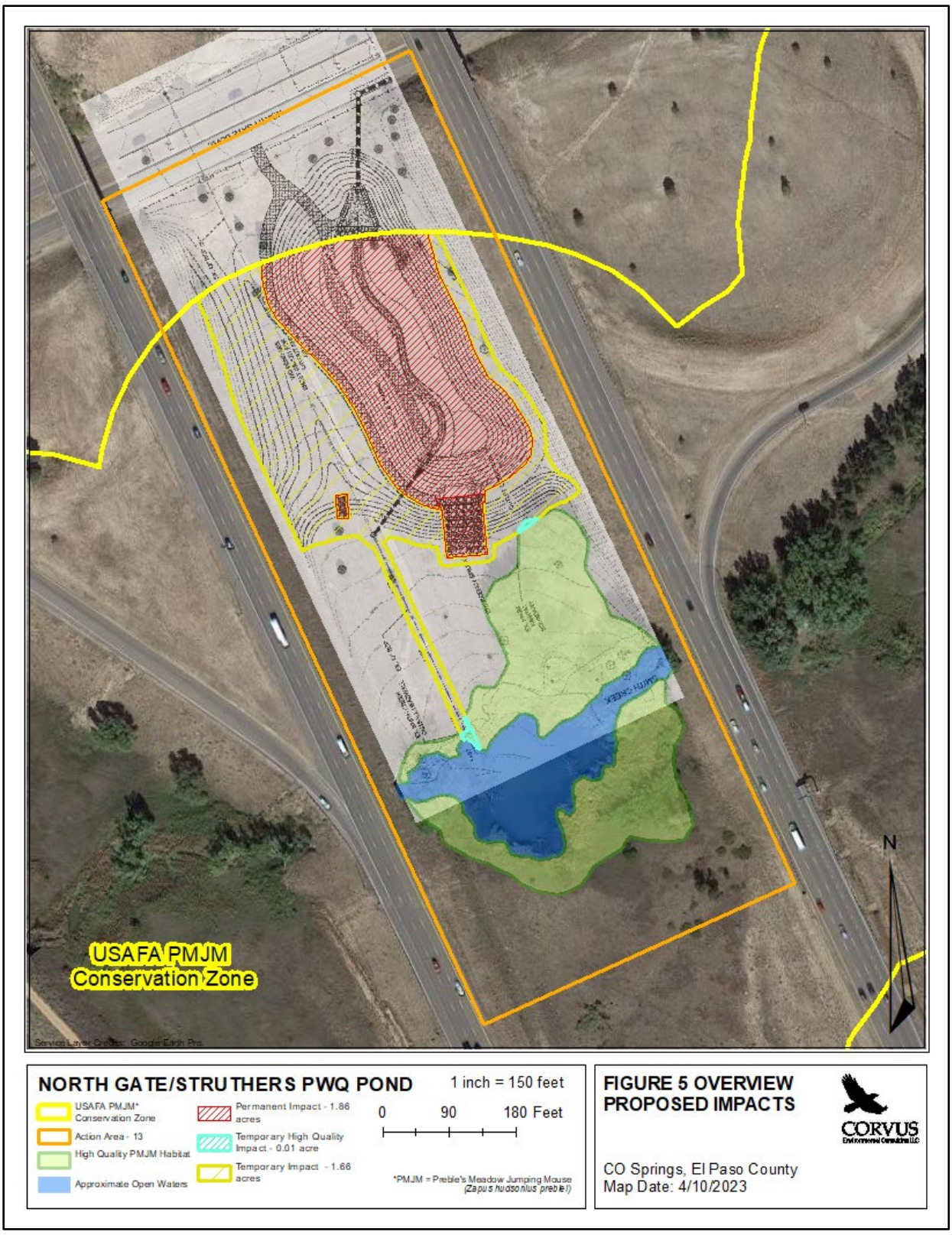

Figure 2. North Gate/Struthers PWQ Pond Overview of Proposed Impacts Colorado Springs, Colorado.

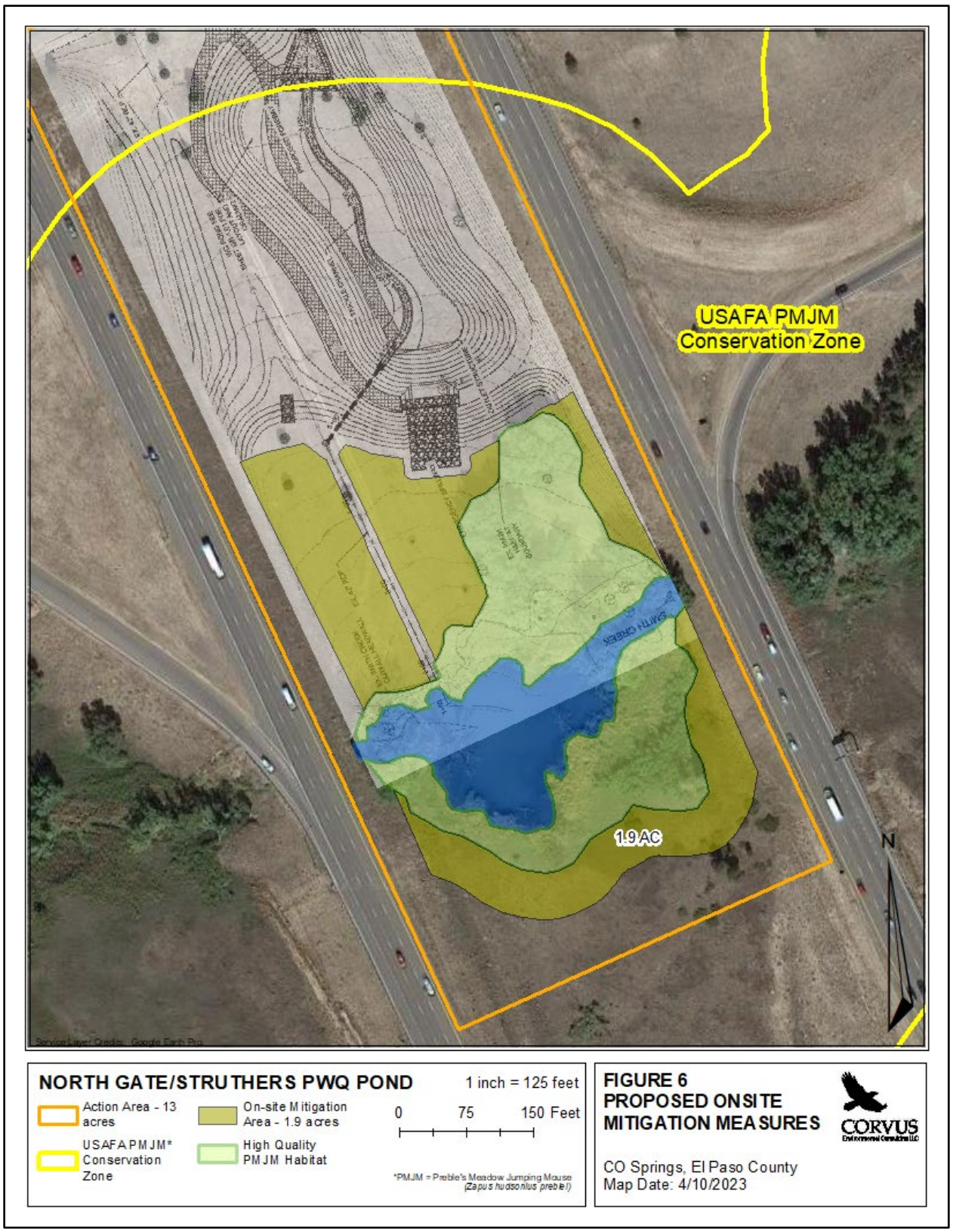

Figure 3. North Gate/Struthers PWQ Pond Proposed Onsite Mitigation Measures, Colorado Springs, Colorado.

Areas which undergo temporary disturbance will be restored using native vegetation once construction is complete. Restoration of disturbed areas will replace existing habitat with vegetation communities that provide higher quality habitat for the Preble's mouse. Restoration will consist of revegetating disturbed areas with native seed mixes and plantings (containerized or willow stakes) designed to enhance Preble's mouse habitat. The purpose for restoring and enhancing habitat through seeding, plantings, and noxious weed control is to increase Preble's mouse habitat cover, hibernation areas, and foraging opportunities as well as increase habitat connectivity. Proposed plant and seeding tables, quantities, and locations (depending on finalized mitigation locations) are provided in Appendix D of the revegetation plan accompanying the biological assessment.

1.2. Monitoring

Protocols for post-restoration and habitat enhancement monitoring have been established to ensure that the Preble's mouse mitigation has been properly implemented, evaluate the success of the planting efforts by identifying problems that could prevent or interfere with the establishment of self-sustaining restoration and enhancement areas, and suggest recommendations to remedy the problems. Monitoring will evaluate the status of the restoration and enhancement measures, including plant composition, density, and site hydrology. It will be the proponent's responsibility (El Paso County) to monitor or contract a qualified biologist to monitor for successful establishment of habitat restoration, enhancement, and noxious weed control.

Mitigation monitoring will occur within the following parameters:

- A qualified ecologist or landscape architect will supervise the implementation of restoration and enhancement.
- Annual mitigation monitoring will be conducted during the growing season and an annual monitoring report will be submitted to USAFA and the Service before December 1 of each year and will extend for five years after completion of the mitigation installation or until project regulators determine that the success criteria have been met.
- Problems that could prevent or interfere with the establishment of the mitigation area will be brought to the attention of the project engineer and project regulators.
- The project engineer will review and approve alterations to the mitigation area design necessary for successful mitigation.
- All recommended remedial actions will be communicated to the project team and will be implemented after they have been approved by the project regulators.

1.3. Success Criteria for Temporary Impact Restoration and Compensatory Habitat Mitigation

Results of the vegetation monitoring efforts will be assessed annually to determine the success of Preble's habitat restoration. Restoration and/or mitigation of Preble's mouse habitat at the project area will be considered successful under the following specifications:

- Site preparation for seeding and planting will use a high-quality topsoil and/or similar amendment (no fertilizer will be applied to the site) consistent with the *USAFA Erosion Control, Revegetation, and Tree Care Standards*.
- At least 50 percent total herbaceous cover of both the temporary impact restoration and compensatory mitigation areas (i.e., habitat enhancement) will be established with native plant species and will be growing without signs of stress or the continued need for irrigation. This requirement is independent of the stormwater construction permit.
- At least 80 percent of planted shrubs will survive.
- Noxious weeds and other invasive species will be controlled in restored and enhanced areas and weed control will be conducted for five years or until it is considered successful when 0 percent of Colorado Department of Agriculture (CDA) designated List A species and less than 5 percent of List B species and 10 percent of list C species are found in overall plant cover from ocular estimates.
- Absolute vegetative cover will be consistent with the surrounding undisturbed habitats.

1.4. Conservation Measures

Conservation measures are actions outlined in the project description that the project proponent will implement to reduce the environmental impacts of the action or promote the recovery of threatened and endangered species. The Service considers the beneficial effects of these conservation measures during the jeopardy and adverse modification analyses. Conservation measures are part of the proposed action, and their implementation is required under the terms of this consultation.

El Paso County worked during the design phase to reduce the pond footprint to result in the most minimal impact to high-quality Preble's mouse habitat. Conservation measures include impact minimization during final design planning, construction phase access limitations, seasonal constraints, limited night-time work, the use of best management practices (BMPs) during project construction, and habitat restoration and enhancement for areas where direct effects to Preble's mouse habitat are anticipated as either temporary or permanent impacts.

Additional conservation measures specific to the Preble's mouse include:

- If feasible, riparian vegetation in the "permanent impact" areas will be mowed or cut to a height of 4-6 inches above the ground during the active season, while Preble's mice are still active and can move away (May-August). This will create a less desirable habitat for hibernation, which usually starts by late September.

- Areas of temporary disturbance will be reseeded with the seed mixes provided by USAFA (as described in the BA).

- Habitat areas, specifically high-quality Preble's mouse habitat such as dense willow areas, will be identified and impacts to these areas will be fully minimized. Native seed mixes and vegetation will be used in all revegetation efforts to reduce erosion and replace habitat value, and the site will be promptly revegetated.

- The contractor will limit areas where bare ground exists. If these areas are temporary impacts, reseeding will be promptly initiated.
- Noxious weeds will be controlled by the contractor in all disturbed habitat areas.
- Erosion and sediment will be controlled using silt fencing and erosion logs or other acceptable BMPs.
- Construction access in Preble's mouse habitat will be confined to areas identified as impact areas.
- Construction access in Preble's mouse habitat will be confined to areas identified as impact areas.
- No construction staging will be allowed in high-quality Preble's mouse habitat.
- Preble's mouse habitat adjacent to construction zones will be fenced to prevent constructions equipment and other disturbances from occurring in these areas.
- A qualified ecologist or landscape architect shall provide a briefing to the contractor prior to ground disturbance to discuss the project and ensure understanding of avoidance and minimization measures.

Conservation measures are thoroughly described on page 11-12 of the biological assessment.

2. ACTION AREA

The action area is not only the immediate area involved in the action, but also includes all areas to be affected directly or indirectly by the federal action (50 CFR § 402.02). The action area contains the most far-reaching potential effects of the federal and non-federal actions on the species being discussed. The action area is defined by measurable or detectable changes in land, air, and water or to other measurable factors that would result from the proposed action. In other words, the action area is not limited to the "footprint" of the action, but rather encompasses the biotic, chemical, and physical impacts to the environment resulting directly or indirectly from the action.

We describe the action area as including not only the project area, which is defined by the limits of the project's disturbance (temporary and permanent impacts), but also the downstream reaches of the affected drainages for a distance of 3.0 miles to conservatively define the action area's downstream limit along a drainage, based on the 2.3-mile maximum recorded dispersal distance for the Preble's mouse.

2.1. Analytical Framework for the Jeopardy Determination

In accordance with regulation (see 84 FR 44976), the jeopardy determination in this Biological Opinion relies on the following four components:

1. The Status of the Species, which evaluates the species' current range-wide condition relative to its reproduction, numbers, and distribution; the factors responsible for that condition; its survival and recovery needs; and explains if the species' current range-wide population is likely to persist while retaining the potential for recovery or is not viable;
2. The Environmental Baseline, which evaluates the current condition of the species in the action area relative to its reproduction, numbers, and distribution absent the consequences of the proposed action; the factors responsible for that condition; and the relationship of the action area to the survival and recovery of the species;
3. The Effects of the Action, which evaluates all future consequences to the species that are reasonably certain to be caused by the proposed action, including the consequences of other activities that are caused by the proposed action, and how those impacts are likely to influence the survival and recovery role of the action area for the species; and
4. Cumulative Effects, which evaluates the consequences of future, non-Federal activities reasonably certain to occur in the action area on the species, and how those impacts are likely to influence the survival and recovery role of the action area for the species.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the consequences of the proposed Federal action in the context of the species' current range-wide status, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the species in the wild. The key to making this finding is clearly establishing the role of the action area in the conservation of the species as a whole, and how the effects of the proposed action, taken together with cumulative effects, are likely to alter that role and the continued existence (i.e., survival) of the species.

3. STATUS OF THE PREBLE'S MEADOW JUMPING MOUSE

Status of the species is based on an analysis of appropriate information on the species' life history, habitat and distribution, and other data on factors related to its survival and recovery. This analysis considers the effects of past human and natural activities or events that have led to the current condition of the species. This information is usually presented in listing documents and refined in recovery plans (Service and NMFS 1998).

The Service added the Preble's meadow jumping mouse to the List of Endangered and Threatened Wildlife in 50 CFR 17.11 as a threatened species on May 13, 1998 (63 FR 26517). As discussed in more detail under the Environmental Baseline section, previous trapping surveys and habitat evaluations confirm that the species occupies the action area.

3.1. Taxonomy

The Preble's meadow jumping mouse is a member of the family Dipdidae (jumping mice) with four living genera, two of which, *Zapus* and *Napaeozapus*, are found in North America (Hall 1981). The three livig species within the genus *Zapus* are *Z. hudsonius* (the meadow jumping mouse), *Z. princeps* (the western jumping mouse), and *Z. trinotatus* (the Pacific jumping mouse). Edward A. Preble (1899) first documented the meadow jumping mouse limited to Colorado and

Wyoming. Taxonomic authorities recognize the Preble's mouse subspecies as one of 12 subspecies of meadow jumping mouse (Hafner et al. 1981).

A September 2013 publication in *Molecular Ecology* further evaluated the genetic relationship between jumping mice, including the Preble's mouse. This study broadly evaluated the entire *Zapus* genus, including all 12 subspecies of meadow jumping mice (*Z. hudsonius*) and confirmed that the Preble's mouse is distinct from neighboring subspecies that were previously proposed to be taxonomically synonymized (*Z. h. campestris* and *Z. h. intermedius*). However, the study concludes that Preble's mouse is closely related to two meadow jumping mouse subspecies that are found in Alaska and Canada (*Z. h. tenellus* and *Z. h. alascensis*), which the study refers to as the "northern lineage" of meadow jumping mice (Malaney and Cook 2013).

Although the study suggests that the Preble's meadow jumping mouse is genetically similar to two subspecies of jumping mice found in Alaska and Canada, it does not propose to revise the formal taxonomy of Preble's mouse or any of the other subspecies of jumping mice. Specifically, the study conclude, "additional tests will be required before hypotheses of infraspecific taxonomic synonymy can be implemented…[and that] a revised taxonomy of the group is needed but is outside the context of this study" (Malaney and Cook 2013).

Although the Preble's mouse may be genetically similar to two other subspecies found more than 800 miles away in Alaska and Canada, the study confirms that the Preble's mouse is genetically isolated from its neighbors found in Wyoming and New Mexico (Malaney and Cook 2013). Therefore, even if the Preble's mouse were to be taxonomically synonymized into a "northern lineage," the Preble's mouse appears to be both (1) distinct, due to the significant geographic separation from the two other subspecies of the "northern lineage" and (2) significant, because the loss of this southernmost population along the Front Range would represent a range retraction of more than seven latitudinal degrees to the north, likely resulting in a significant gap in the range of the taxon. Therefore, the best available information continues to indicate that the Preble's mouse is a valid subspecies of meadow jumping mice (SEI 2006).

3.2. Physical Description

The Preble's mouse is a small mouse with an extremely long tail, large hind feet, and long hind legs, which enable jumping mice to make prodigious leaps (Figure 4). The long tail is bicolored, lightly furred, and twice as long as the body. The large hind feet are three times as large as those of other mice of similar body size. Preble's mice have a distinct, dark, broad stripe on its back that runs from head to tail and is bordered on either side by grey to rusty, orange-brown fur. The hair on the back of all jumping mice appears coarse compared to other mice. White hairs on the underside are finer.

Figure 4. The Preble's meadow jumping mouse, or Preble's, has an extremely long tail, large hind feet, and a distinctive dark stripe running along its back. Unlike deer mice or voles, the Preble's makes incredible jumps to escape predators. Left photo: The Preble's is in "torpor," or cold-induced hibernation/sleep. (USFWS)

Adult Preble's mice are approximately seven to 10 inches long and the tail is four to six inches long (Krutzsch 1954; Fitzgerald et al. 1994; Fitzgerald et al. 2011). The average weight of 120 adult Preble's mice captured early in their active season prior to June 18 was 0.6 ounces; included were 10 pregnant females weighing more than 0.8 ounces (Meaney et al. 2002).

3.3. Preble's meadow jumping mouse Life History

3.3.1. Habitat

Preble's meadow jumping mice live in well-developed, plains riparian vegetation with adjacent, relatively undisturbed grassland communities and a nearby water source (Figure 5). The well-developed, plains riparian vegetation typically includes a dense combination of grasses, forbs, and shrubs; a taller shrub and tree canopy may be present (Bakeman 1997). When a taller canopy is present, the shrub canopy is often willow (*Salix* spp.), although other shrub species, including snowberry (*Symphoricarpos* spp.), chokecherry (*Prunus virginiana*), hawthorn (*Crataegus* spp.), Gambel's oak (*Quercus gambelli*), alder (*Alnus incana*), river birch (*Betula fontinalis*), skunkbrush (*Rhus trilobata*), wild plum (*P. americana*), lead plant (*Amorpha fruticose*), dogwood (*Cornus sericea*) and others may also occur (Bakeman 1997, Shenk and Eussen 1998).

Figure 5. Preble's habitats feature dense riparian vegetation, such as willows and cottonwoods, and adjacent grassy uplands within 300 feet of the 100-year floodplain, with an open water source nearby. (USFWS)

Preble's mice have rarely been trapped in uplands adjacent to riparian areas (Dharman 2001; Hansen 2006). However, Preble's mice feed and rest in adjacent uplands (Shenk and Sivert 1999a; Schorr 2001) as far out as 328 feet beyond the 100-year floodplain (Ryon 1999; Shenk and Sivert 1999a; Schorr 2001). Adjacent uplands used by the Preble's mouse are extremely variable ranging from open grasslands to ponderosa pine (*Pinus ponderosa*) woodlands (Corn et al. 1995; Pague and Grunau 2000).

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

During the active season, Preble's mice construct day nests composed of grasses, forbs, sedges, rushes, and other available plant material. Day nests may be globular in shape or simply raised mats of litter, and are most commonly above ground but may also be below ground. Day nests are typically located under debris at the base of shrubs and trees, or in open grasslands (Ryon

2001). Mice may have multiple day nests in both riparian and grassland communities (Shenk and Sivert 1999b) and may abandon a nest after approximately one week of use (Ryon 2001).

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

3.3.2. Hibernation

The Preble's mouse is a true hibernator, usually entering hibernation in September or October and emerging the following May, after a long hibernation period of seven to eight months. Adults enter hibernation first before young of the year because they accumulate the necessary fat stores more quickly. Similar to other subspecies of meadow jumping mouse, Preble's mice do not store food for hibernation. Instead, while hibernating, the Preble's mouse persists on fat stores accumulated prior to hibernation (Whitaker 1963).

Hibernacula (hibernation nests) of Preble's mouse have been located both within and outside of the 100-year floodplain of streams (Shenk and Sivert 1999b; Ryon 2001; Schorr 2001). Those hibernating outside of the 100-year floodplain would likely be less vulnerable to flood-related mortality. Fifteen apparent Preble's mouse hibernacula have been located through radio telemetry, all within 260 feet of a perennial streambed or intermittent tributary (Bakeman and Deans 1997; Shenk and Sivert 1999b; Schorr 2001).

Hibernacula have been located under willow, chokecherry, snowberry, skunkbush, sumac (*Rhus* spp.), clematis (*Clematis* spp.), cottonwoods (*Populus* spp.), Gambel's oak, thistle (*Cirsium* spp.), and alyssum (*Alyssum* spp.) (Shenk and Sivert 1999b). At the Academy near Colorado Springs, four of six likely hibernacula found by radio-telemetry were located in close proximity to coyote willow (*Salix exigua*) (Schorr 2001). The one excavated hibernaculum at Rocky Flats south of Boulder, was found 30 feet (9.1 meters) above the streambed, in a dense patch of chokecherry and snowberry (Bakeman and Deans 1997). The nest was constructed of leaf litter 12 inches below the surface in coarse textured soil.

3.3.3. Movements and Home Range

Radio telemetry and mark-recapture data provide insight into the Preble's mouse home ranges and dispersal capabilities. At Plum Creek in Douglas County, Colorado, the Preble's mouse home ranges averaged 1.24 acres based on radiotelemetry (Trainor et al. 2012). In the Pike National Forest of Colorado, travel distances averaged 1,357 feet with an approximate home range size of 1.02 acres (Hansen 2006). At the Academy in El Paso County, Colorado, home ranges were between 0.42 to 9.49 acres, with an average home range of 3.48 acres. During this study, the farthest distance moved by individual Preble's mouse ranged from 43 to 3,176 feet, with an average maximum travel distance of 1,188 feet (Schorr 2003). An earlier study documented a Preble's mouse moving as far as 0.7 miles in 24 hours (Ryon 1999). However, compared to radio telemetry data, mark-recapture data suggest that the Preble's mouse may have

longer dispersal capabilities. Mark-recapture data between active seasons identified mice traveling more than 4 kilometers (2.3 miles) along a linear riparian system (Schorr 2003; Schorr 2012).

3.3.4. Reproduction and Lifespan Habitat

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

Although Preble's mice are long-lived compared to other small rodents, the annual survival rate is low. Preble's survival rates appear to be lower over the summer than over the winter. Over-summer survival rates ranged from 22 to 78 percent and over-winter survival rates ranged from 56 to 97 percent (Shenk and Sivert 1999a; Schorr 2001; Meaney et al. 2002). Higher overwintering survival rates indicate that predation or other factors impact Preble's mice during the active season.

3.3.5. Causes of Mortality

Known predators of the Preble's mouse include garter snakes (*Thamnophis* spp.), prairie rattlesnake (*Crotalus viridus*), bullfrog (*Rana catesbiana*), red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), house cat (*Felis catus*), long-tailed weasel (*Mustela frenata*), and red-tailed hawk (*Buteo jamaicensis*). Drowning and vehicle collisions also kill Preble's mice (Shenk and Sivert 1999b; Schorr 2001). Other causes of death include starvation, exposure, disease, and insufficient fat stores for hibernation (Whitaker 1963).

3.3.6. Diet

Although fecal analyses provide the best data on Preble's mouse diet, they overestimate the components of the diet that are less digestible. Preble's mouse diets shift seasonally, consisting primarily of insects and fungi after emerging from hibernation, and shifting to fungi, moss, seeds, and pollen during mid-summer (July through August), with insects again added in September. The shift in diet along with shifts in mouse movements suggests that Preble's mouse may require specific seasonal diets, perhaps related to the physiological constraints imposed by hibernation (Shenk and Sivert 1999b).

3.4. Preble's Abundance and Trends

Due to the difficulty of implementing long-term trapping studies needed to assess population sizes, quantitative studies designed to estimate Preble's mouse populations have occurred at only a few sites in Colorado. As a result, we lack a reliable regional, statewide, or rangewide population estimate for the Preble's mouse.

In Colorado, we have several population estimates, but little trend information from Preble's mouse populations. In addition, because jumping mouse population sizes in a given area vary significantly from year to year (Quimby 1951; Whitaker 19724), short-term studies may not accurately characterize abundance. In one ongoing trapping study, population highs of 24 and 69 Preble's mice per site were estimated for two control sites in 1999; a subsequent trapping in 2002, during regional drought conditions, found no Preble's mice at either site (Bakeman 2006). Over four years, Preble's mouse populations varied widely and were absent at certain sites during some seasons, suggesting that 10 or more years of study might be necessary to assess the full extent of variation in Preble's mouse populations (Meaney et al. 2003).

Because the Preble's mouse occupied linear riparian communities, researchers estimate abundance as the number of mice per kilometer (or mile) of riparian corridor. Estimates of linear abundance range widely, from three to 107 mice per mile (two to 67 mice per kilometer) with a mean of approximately 44 nice per mile (27 mice per kilometer) (Shenk 2004). These above abundance estimates, coupled with sufficient knowledge of occupied stream miles, may provide a rough indicator of Preble's mouse numbers within a stream reach or drainage, but may overestimate actual population size (Hayward 2002). The Recovery Team used the 44 mice per mile (27 mice per kilometer) population estimate (Shenk 2004) to approximate the number of stream miles required to support varying sized populations of Preble's mice (Service 2003).

As with abundance estimates, the difficulty of implementing long-term trapping studies limits the availability of population trend data for the Preble's mouse. Since 1998, there have been few attempts to characterize changes in Preble's mouse populations over time. One long-term study at the Academy in El Paso County, Colorado, provides the most thorough estimate of population trends for the subspecies. Mark-recapture data over seven years at the Academy suggested that populations were declining (Schorr 2012).

3.5. Preble's Status and Distribution

The Preble's mouse lives along the foothills in southeastern Wyoming, southward along the eastern edge of the Front Range of Colorado to Colorado Springs, El Paso County (Hall 1981; Clark and Stromberg 1987; Fitzgerald et al. 1994; Fitzgerald et al. 2011). Knowledge about the current distribution of the Preble's mouse comes from collected specimens, and live-trapping locations from both rangewide survey efforts and numerous site-specific survey efforts conducted in Wyoming and Colorado since the mid-1990s. The Denver Museum of Nature and Science houses recently collected specimens. Trappers file survey reports with the Service's Field Offices in Colorado in Wyoming.

In Wyoming, capture locations of mice confirmed as the Preble's mouse, and location of mice identified in the field as Preble's mice and released, extend in a band from the town of Douglas southward along the Laramie Range to the Colorado border, with captures east to eastern Platte County and Cheyenne, Laramie County. The Preble's mouse does not likely extend west past the crest of the Laramie Range in Wyoming (Bowe and Beavais 2012). In Colorado, the distribution of the Preble's forms a band along the Front Range from Wyoming southward to Colorado Springs, El Paso County, with eastern marginal captures in western Weld County, western Elbert County, and north central El Paso County.

The Preble's mouse is likely an Ice Age relict (Hafner et al. 1981; Fitzgerald et al. 1994; Fitzgerald et al. 2011). Once the glaciers receded from the Front Range of Colorado and the foothills of Wyoming and the climate became drier, the Preble's mouse was confined to the riparian systems where moisture was more plentiful. The semi-arid climate in southeastern Wyoming and eastern Colorado limits the eastern extent of riparian corridors and restricts the range of the Preble's mouse. The Preble's mouse has not been found east of Cheyenne in Wyoming or on the extreme eastern plains in Colorado. The dry shortgrass prairie defines the eastern boundary for the subspecies and may present a barrier to eastward expansion (Beauvais 2001).

Higher elevations along the Laramie Range and the Front Range likely impose the western boundary of the Preble's mouse. The Service has used 7,600 feet (2,300 meters) in elevation as the general upward limit of Preble's mouse habitat in Colorado (Service 1998). Recent morphological examination of specimens has confirmed Preble's to an elevation of approximately 7,600 feet (2,300 meters) in Colorado (Meaney et al. 2003). In a modeling study of habitat associations in Wyoming, Keinath (2001) found suitable habitat predicted in the Laramie Basin and Snowy Range Mountains (west of known Preble's captures) but very little suitable habitat predicted on the plains of Goshen, Niobrara, and eastern Laramie counties (east of known Preble's mouse captures).

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

Although there is little information on historic distribution and abundance of the Preble's mouse, surveys identified various locations where the subspecies was historically present but is now absent (Ryon 1996). Despite numerous surveys, the Preble's mouse has not recently been found in the Denver or Colorado Springs metropolitan areas and is believed to be extirpated from these areas because of extensive urban development. Since at least 1991, the Preble's mouse has not been found in Denver, Adams, or Arapahoe counties in Colorado. Its absence in these counties is likely due to urban development, which has altered, reduced, or eliminated riparian habitat (Compton and Hugie 1993; Ryon 1996).

3.5.1. Preble's Occupied Range in Colorado

A map layer, "Preble's mouse occupied range," developed by Colorado Parks and Wildlife (CPW 2007), estimates the acres of habitats occupied by the Preble's mouse in Colorado. CPW developed this occupied range layer by drawing habitat polygons around points where trappers

have captured Preble's mice. Based on the trapping records, CPW estimated that Colorado supports approximately 89,771.7 acres of occupied Preble's mouse habitats.

However, CPW's mapping effort underestimates the actual acres of potentially occupied habitats in Colorado because it incorporates only habitats where mouse trapping has occurred. The point data used to draw the *occupied range* polygons records only Preble's mouse captures, but trappers have not trapped all the potential or likely occupied Preble's mouse habitats in Colorado. Although CPW's occupied range map is an estimate, it is the best available estimate of acres of occupied habitat for the Preble's mouse in Colorado. The layer overestimates potential habitats elsewhere, by including areas of non-habitat.

3.6. Threats to the Preble's

Below we summarize threats to the Preble's mouse. Our most recent 12-month status review for the Preble's published in the **Federal Register** on May 23, 2013, provides more detail and analysis regarding threats (78 FR 31679; https://federalregister.gov/a/2013-12387).

3.6.1. Agricultural Land Conversions

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

3.6.2. Recreational Trails

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

3.6.3. Habitat Fragmentation

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

3.6.4. Hydrologic Changes

Hydrology of a waterway influences the structure and function of the corresponding riparian ecosystems. Water development and management may facilitate development of lush riparian vegetation by maintaining more moisture in the riparian areas for longer periods, particularly during drought. However, changes in timing and abundance of water may also alter the channel structure, riparian vegetation, and the adjacent floodplain, which may be detrimental to the persistence of Preble's mice. Increased development and impervious surface within a drainage can result in more frequent and severe flood events and prevent the maintenance of riparian communities. Bank stabilization, channelization, and other measures to address flooding and storm water runoff have increased the rate of stream flow, straightened riparian channels, and narrowed riparian areas (Pague and Grunau 2000). Riprap and other stabilization structures designed to reduce erosion can destroy riparian vegetation, while preventing or prolonging its reestablishment. Erosion control measures can adversely alter the hydrologic processes and riparian plant communities such that Preble's mouse populations can no longer persist.

3.6.5. Aggregate Mining

Alluvial aggregate extraction may produce long-term changes to Preble's mouse habitat by altering hydrology and removing riparian vegetation. Extraction removes and often precludes reestablishment of habitat components required by Preble's mice, such as vegetation for feeding and sheltering and deposits of alluvial sands and gravels that may be important hibernation locations for hibernation.

3.6.6. Transportation Corridors

Transportation and utility corridors frequently cross Preble's meadow jumping mouse habitat and may negatively affect populations. Road construction and maintenance degrades, destroys, and fragments Preble's mouse habitats. Roads and bridges also may act as barriers to dispersal. Accidents within or near riparian areas may spill chemicals, fuels and other substances into wetlands and waterways that may impact the Preble's mouse and its habitat. Sewer, water, communications, gas, and electric lines cross Preble's mouse and contribute to habitat disturbance and fragmentation through new construction and periodic maintenance. Impacts related to construction are often temporary if adequate rehabilitation and reclamation actions are implemented.

3.6.7. Noxious Weeds

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

3.6.8. Pesticides and Herbicides

Pesticides and herbicides are used within the range of the Preble's mouse. Inappropriate use of these chemicals may harm the Preble's mouse directly or when ingested with food or water.

Overall, an integrated pest management approach (use of biological, chemical, and mechanical control) may help reduce the threat of chemicals but allow for the control of target species.

3.6.9. Floods

Floods occur throughout the Preble's mouse range in the Wyoming and Colorado foothills and plains. Preble's mice and their streamside habitats evolved under historic flood regimes, so populations and habitats naturally respond to floods. While floods may affect Preble's mouse populations by killing individuals and destroying riparian and adjacent upland habitats, the effects to vegetation are usually temporary. Vegetation typically reestablishes quickly after floods, although larger floods may delay recovery. Routine flooding may help maintain the vegetative communities that provide suitable habitat for the Preble's mouse. Preble's mice that hibernate outside the 100-year floodplain are less likely to drown in a flood.

However, manmade increases in impervious surfaces and the loss of vegetation caused by human activities or catastrophic wildfire can result in an increased frequency and severity of flood events. Flooding is often a byproduct of wildfires and may act synergistically to alter the composition and structure of riparian ecosystems for many years (Ellis 2001). Therefore, extreme floods may prevent the re-establishment of the Preble's favored riparian vegetation, forcing mice to disperse until habitats recover. Although an extreme flood can eliminate an entire Preble's mouse population in an affected stream reach, floods are less likely to eliminate the Preble's from an entire drainage system if populations extend into side tributaries or headwaters unaffected by the flood. Therefore, maintaining the connectivity of riparian habitats between stream reaches is crucial to maintaining the security of Preble's mouse populations faced with an increased incidence of flooding.

In September 2013, heavy rains in Colorado flooded streams and inundated many riparian and upland habitats occupied by the Preble's in Larimer, El Paso, Boulder, and Weld Counties. By drowning Preble's mice, scouring vegetation, removing topsoil, and depositing debris, early estimates suggest that the flood disaster affected approximately 60 percent of the Preble's mouse occupied range and approximately 70 percent of its designated critical habitat in Colorado.

Many Preble's mice may have drowned where the flash floods were large, unpredictable, or destructive. Throughout the flood disaster zone, especially in more mountainous (montane) habitats of the Front Range foothills, the flash floods completely inundated the Preble's mouse habitats, with the fast-moving floodwaters often extending far beyond the limits of the floodplain. Many Preble's mice in these high intensity flash flood areas may not have been able to escape the floodwaters and washed downstream or drowned. Preble's mouse densities were low before the flood disaster, especially in the montane habitats at the westernmost extent of the Preble's mouse range, so the floods may have significantly reduced range wide population numbers.

Trapping surveys, habitat evaluations, and remote imagery will be necessary to gauge the full effect of the flood disaster on the Preble's mouse. Although population and habitat losses were likely significant across approximately 60 percent of the Preble's occupied range, some Preble's mice may have survived. Survivors will be critical to the Preble's mouse recovery in the flood disaster zone.

3.6.10. Wildfire

Fire, particularly catastrophic fires, can alter habitat dramatically and change the structure and composition of the vegetation communities such that the Preble's mouse may no longer persist. In addition, precipitation falling in a burned area may degrade Preble's mouse habitat by causing greater levels of erosion and sedimentation. Controlled use of fire may be one method to maintain appropriate riparian floodplain, and upland vegetation within Preble's mouse habitat. However, over the past several decades, as human presence has increased throughout the Preble's mouse range, significant effort has been made to suppress fires. Long periods of fire suppression may result in a build-up of fuel and result in a catastrophic fire that significantly impacts Preble's mouse habitats by burning vegetation or increasing catastrophic floods.

3.6.11. Predation

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

3.6.12. Climate Change

Climate change may negatively affect the Preble's meadow jumping mouse and its habitat, primarily by causing changes in stream flows resulting in reduced quality and quantity of riparian habitats. Trends of warming in the mountains of western North America could decrease snowpack, hasten spring runoff, and reduce summer flows. While fewer cold days and nights could result in increased plant biomass yield in colder environments, increased summer heat may increase the frequency and intensity of wildfires, decrease the productivity of riparian vegetation, and increase the frequency and duration of droughts (IPCC 2007). Stream-flow reductions or seasonal changes in flow due to climate change will probably cause a greater disruption in watersheds with a high level of human development (Hurd et al. 1999) where human demands for water resource are greatest.

4. ENVIRONMENTAL BASELINE

Regulations implementing the ESA (50 CFR 402.02) define the environmental baseline as the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline.

The project area is approximately 4.6 acres in size and is defined as the limits of disturbance associated with the project. Most of the project is located within CDOT's easement from USAFA, between the northbound and southbound lanes of I-25 at Exit 156, at the northern end of the City of Colorado Springs. The USAFA Preble's Mouse Conservation Zone overlaps most of the project area. The location for the proposed PWQ detention pond currently consists of an open field with sparse native brush that thickens towards Smith Creek.

The topography of the project area ranges from flat to hilly. Upland vegetation at the project area surrounds a highway interchange, has been regularly disturbed because of infrastructure developments and contains a mix of both native and invasive species. Dominant species observed in the upland habitat areas include fringed sage (*Artemisia figida*), mullein (*Verbascum thapsus*), cheatgrass (*Bromus tectorum*), sand dropseed (*Sporobolus cryptandrus*), diffuse knapweed (*Acosta diffusa*), intermediate wheatgrass (*Agropyron intermedium*), western wheatgrass (*Pascopyrum smithii*), and prairie sandreed (*Calamovilfa longifolia*). Upland terraces along Smith Creek include woody riparian species such as snowberry (*Symphoricarpos occidentalis*) and Wood's rose (*Rosa woodsia*) interspersed between introduced perennial cool season grasses, including smooth brome (*Bromus inermis*), and Kentucky bluegrass (*Poa pratensis*). The upland areas also contain a few scattered ponderosa pine (*Pinus ponderosa*) trees.

There are three different types of wetlands found within the project area: palustrine emergent (PEM), palustrine scrub-shrub (PSS), and palustrine forested (PFO). Common herbaceous wetland species include narrowleaf cattail (*Typha angustifolia*) and broadleaf cattail (*Typha latifolia*), as well as switch grass (*Panicum virgatum*) and arctic rush (*Juncus arcticus*). Shrub species observed included mostly sandbar willow. Tree species observed included peachleaf willow (*Salix amygdaloides*) and plains cottonwood (*Populus deltoides*).

4.1. Status of the Preble's meadow jumping mouse within the Proposed Project and Action Areas

The project area is within known occupied habitat for the Preble's mouse. A Conservation Agreement and Conservation Plan between the Service and USAFA was established in 2000 which provides for the long-term survival and conservation of the Preble's mouse and its habitat within lands owned by USAFA. Designated critical habitat for the Preble's mouse is located outside of the USAFA boundary to the east along Smith Creek and Monument Branch; however, there is no critical habitat in the action area as it lies within the USAFA boundaries. Mice were captured at two locations at the existing pond within the action area by the Colorado Natural Heritage Program; three mice were captured in 2019 and three mice were captured in 2016. Additional trapping locations occur approximately 600 and 900 feet east of the action area along Smith Creek east of northbound I-25 where two mice were captured in 2019 and four mice were captured in 2000, respectively. Two additional trapping locations occur approximately 500 and 530 feet west of the action area west of southbound I-25 where 10 mice were captured in 1995 and three mice were captured in 2019, respectively.

Smith Creek is a tributary to Monument Creek which flows through USAFA and is known to host a robust population of Preble's mice. High-quality Preble's mouse habitat was mapped within the riparian portion of the project area. Low-quality habitat was defined as upland habitat

with little to no shrub cover. According to mapping efforts by CORVUS, there are 0.01-acre of high-quality riparian habitat and 4.59 acres of low-quality upland habitat within the project area.

Smith Creek is within the Monument Creek watershed which is part of the Arkansas River Basin. Preble's mouse populations along drainages in the Arkansas River Basin have likely decreased over time. The project area occurs within the Fountain hydrologic unit code within the South Recovery Unit as defined in the Preble's mouse recovery plan which has a medium-sized potential recovery population (Service 2018).

At this time, we lack a concise population estimate (mice per acre or mice per stream mile) for the Preble's mouse in the project area; therefore, we will rely on work conducted in a similar riparian system located along Monument Creek approximately ½-mile west of the project area. USAFA calculated a Preble's meadow jumping mouse population on site ranging from 1,513 to 4,864 based on trapping surveys for the April 2000 Conservation Agreement. In addition, the conservation boundary, measured as 300 feet from the 100-year floodplain of Monument Creek and its tributaries totals approximately 3,245 acres. Using the high end of the range (4,864 mice) to derive the likely maximum number of mice exposed to project activities, we calculate a population estimate of approximately 1.5 mice/acre with high quality habitat on Monument Creek and its tributaries. Based on this estimate, the 3.54 acres of total impacts may support approximately five mice.

4.2. Regulatory Actions under the ESA Completed by the Service for the Preble's Meadow Jumping Mouse

Since listing the Preble's meadow jumping mouse in May 1998, we have conducted 233 formal consultations pursuant to section 7 of the ESA and issued 23 incidental take permits pursuant to section 10(a)(1)(B) if the ESA for the Preble's in Colorado. In Wyoming, we have completed 13 formal consultations under section 7 of the ESA but have not issued any incidental take permits under section 10(a)(1)(B) if the ESA.

Tables 2 through 5 below summarize the total acres of habitat loss exempted of incidental take permitted by the Service through these actions in Colorado and Wyoming. Throughout the Preble's range, we have permitted take of approximately 4.5 percent of CPW's occupied range for Colorado. We provided this take to a variety of projects, including residential and commercial developments, transportation projects, recreational facilities, and water supply projects.

Table 2. Number of Preble's mouse habitat loss exemptions or incidental take permits issued by the Service under the ESA between May 1998 and April 2023 in Colorado and Wyoming.

Regulatory Authority of the ESA	Colorado	Wyoming
Section 7 (federal consultations)	233	13
Section 10 (non-federal consultations)	23	0
STATEWIDE TOTAL	**256**	**13**
RANGEWIDE TOTAL =	**269**	

Table 3. Total acres of permanent Preble's mouse habitat loss permitted by the Service under the ESA between May 1998 and April 2023 in Colorado and Wyoming.

Regulatory Authority of the ESA	Colorado	Wyoming
Section 7 (federal consultations)	948.94	70.97
Section 10 (non-federal consultations)	428.72*	0.00
STATEWIDE TOTAL	**1,377.66***	**70.97**
RANGEWIDE TOTAL =	**1,448.63**	

*The total acres of permanent take exempted under section 10 does not include the Livermore Habitat Conservation Plan (HCP) in Larimer County, Colorado, completed in January 2004, which exempts up to 3,357 acres of permanent habitat loss. As of June 2020, there are no enrollments in the Livermore HCP and the Service has not completed any section 10 consultations in Wyoming.

Table 4. Total acres of temporary‡ Preble's mouse habitat loss allowed by the Service under the ESA between May 1998 and April 2023 in Colorado and Wyoming.

Regulatory Authority of the ESA	Colorado	Wyoming
Section 7 (federal consultations)	2,288.88	42.69
Section 10 (non-federal consultations)	271.13*	0.00
STATEWIDE TOTAL	**2,560.01***	**42.69**
RANGEWIDE TOTAL =	**2,602.70**	

‡ Project proponents completely restore, and often enhance, habitats that they temporarily impact.
*As of June 2020, the Service has not completed any section 10 consultations in Wyoming.

Table 5. Percent of Preble's mouse occupied range (CPW layer‡) in Colorado affected by habitat loss exemption or incidental take permits issued by the Service under the ESA between May 1998 and April 2023 in Colorado and Wyoming.

Percent Habitat Loss	Colorado
Permanent	1.61%
Temporary	2.90%
STATEWIDE TOTAL	**4.51%**

‡ Colorado Parks and Wildlife (CPW) created their occupied range data layer for Preble's by buffering upstream and downstream habitats around positive capture locations, thereby estimating that there are 89,771.70 acres of occupied Preble's range in Colorado. We lack a similar estimate for Wyoming, so we use the estimate for Colorado as a conservative rangewide estimate.

5. EFFECTS OF THE ACTION

In accordance with 50 CFR 402.02, effects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of all other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (see §402.17).

Effects of the action are a reasonable prediction of the likely reaction of, and biological effect to, individuals of a species to the environmental changes brought about by implementation of the chosen proposed action. It is not an exploration of alternatives to the proposed action. As with any prediction of an animal's response to environmental impacts, there are many uncertainties associated with it. The prediction must be a reasoned prediction that is informed by science (if available). But because scientific literature reports on the results of controlled experiments and purposefully restricts its findings to the conditions and circumstances of the study, its findings can only be used to inform a predicted result from a future proposed action - it cannot determine the outcome with certainty. Therefore, additional information from observations on other species, from other environments and professional judgment from biologists familiar with the species also play a role in arriving at a reasoned prediction.

The proposed project would temporarily disturb a total of 3.54 acres of Preble’s mouse habitat of which 1.67 acres of impact are temporary and 1.87 acres of impact are permanent (Table 6). Temporary ground disturbance in high-quality riparian habitat (0.01 acre of impact) and adjacent low-quality upland habitat (1.66 acres of impact) would adversely affect the Preble’s mouse by temporarily removing hibernation, nesting, and foraging habitat. Temporary habitat impacts would result from grading the temporary access to the stream outfall, and the heavy equipment used to complete restoration activities. Permanent impacts would result from construction of the riprap spillways associated with the PWQ pond and construction of access roadways, forebay, detention basin, and trickle channel. While the pond walls and floor would likely revegetate after construction and could potentially provide better riparian habitat than what currently exists, it is likely the pond would need to be maintained. Therefore, the County is presuming that impacts within the pond footprint would be permanent and not temporary given that regular maintenance could result in future periodic/intermittent disturbance.

Table 6. North Gate/Struthers Road PWQ Pond Impact Summary

Proposed Activity	Low-quality Preble's Mouse Habitat (Uplands)		High-quality Preble's Mouse Habitat (Riparian)		Total Impact per Activity (acres)
	Permanent Impact (acres)	Temporary Impact (acres)	Permanent Impact (acres)	Temporary Impact (acres)	
Grading, temporary access to stream outfall	0	1.66	0	0.01	1.67
Riprap spillways	0.12	0	0	0	0.12
Access roadways, forebay, detention basin, trickle channel	1.75	0	0	0	1.75
Total	***1.87***	***1.66***	***0***	***0.01***	***3.54***

5.1. Effects to the Preble's meadow jumping mouse

Direct effects on the Preble's mouse and their habitat may occur form habitat disturbance during construction, which may injure or kill one or more individuals unable to avoid being crushed by equipment or buried by earthwork. Direct effects may also result from permanently reduced habitat availability following construction, as well as reduced habitat availability in temporarily disturbed areas until seeding and plantings become established during restoration. If breeding or foraging habitat is reduced, there may be an associated reduction in the Preble's mouse reproductive productivity or survivorship. If hibernaculum habitat is disturbed, fewer Preble's mice may survive over the subsequent one-to-two winters.

The project would also result in indirect effects to Preble's mouse and its habitat. Indirect effects to individual mice could occur from increased noise, vibration, and lighting caused by project activities, erosion and sedimentation of soils, dust from construction activities, and potential introduction or spread of noxious weeds. During and after restoration activities, opportunistic weeds may colonize disturbed soils, degrading habitat and hindering the establishment of native species. However, monitoring and weed management should minimize any habitat loss associated with invasive plants.

Because of the short duration of the proposed project (approximately five months), we do not think that climate change will affect the species.

Using the methods provided above in the *Status of the Preble's Meadow Jumping Mouse within the Action Area* section, we anticipate that up to five individual Preble's mice would be taken by completion of the project 3.54 acres of temporary effects x 1.5 mice/acre). Given the amount and type of habitat, we believe that this is a reasonable estimate.

5.2. Cumulative Effects

Cumulative effects are those "effects of future State or private activities, not involving federal activities, that are reasonably certain to occur within the action area" considered in this Biological Opinion (50 CFR 402.02). 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.

Cumulative effects within the action area include ongoing and future urban development within upland areas within and surrounding the action area which would potentially impact Preble's habitat integrity, connectivity, or quality, and include state, local, and private actions. Future residential, mixed-use, commercial, and light industrial development is expected near and within the vicinity of the project area. Once completed, this project would provide adequate flood conveyance in anticipation of an increase in flows within the watershed due to increased development. Nonnative plant species have the potential to degrade healthy vegetative communities essential to the Preble's mouse. The proposed project would include human-made corridors that frequently promote the establishment and spread of this species that are already present in road ditches.

6. CONCLUSION

The Service defines "jeopardize the continued existence of" as to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR § 402.02).

Recovery calls for improvement in the status of listed species to the point at which listing is no longer appropriate under the criteria identified in section 4(a)(1) of the ESA (50 CFR § 402.02).

After reviewing the current status of the affected species, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the action as proposed is not likely to jeopardize the continued existence of the Preble's meadow jumping mouse. We base our conclusion on the following:

- The action area constitutes a small portion of the species' entire range. Although take of the Preble's meadow jumping mouse from project construction is likely to occur, the anticipated level is small in proportion to the size of the population. The restoration of the project area will maintain long-term protected upland and riparian habitat for the Preble's mouse.

- The likelihood of the survival and recovery of the Preble's meadow jumping mouse will not be precluded through implementation of the proposed action.

The conclusions of this biological opinion are based on full implementation of the project as described in the *Description of the Proposed Action* section of this document, including any conservation measures that were incorporated into the project design.

INCIDENTAL TAKE STATEMENT

1. INTRODUCTION

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

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

2. AMOUNT OR EXTENT OF TAKE

The Service anticipates that El Paso County's proposed action will result in incidental take of 3.54 acres of Preble's meadow jumping mouse habitat, of which all 1.67 acres are temporary, and 1.87 acres are permanent, and the incidental take, in the form of *harm*, of no more than five individual mice. This take will be difficult to detect because of the species' small size, solitary nature, and hibernation underground. However, we estimate the amount of take by considering the loss of food, cover, and other essential habitat elements, and disturbance associated with the proposed action.

In the above biological opinion, we determined that this level of anticipated take is not likely to result in jeopardy to the species.

2.1. Reasonable and Prudent Measures

The reasonable and prudent measures, and implementing terms and conditions, minimize the effects of incidental take that might otherwise result from the action. In addition to the Conservation Measures already proposed as part of the project description, the Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of the Preble's meadow jumping mouse:

1. El Paso County will monitor the extent of habitat impacted to ensure that it does not exceed the authorized area or the authorized take limits.

2. El Paso County will monitor all aspects of restoration to assure its completion and success.

3. El Paso County will ensure that best management practices and conservation measures designed to minimize take are implemented and successful.

2.2. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, USACE must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring. These terms and conditions are non-discretionary.

The following terms and conditions implement reasonable and prudent measures:

1. El Paso County shall ensure that proposed conservation measures (outlined above and in the biological assessment), are formally adopted and implemented.

2. El Paso County or their agent will designate a qualified environmental manager or management team to be onsite to inform workers of permit conditions, monitor construction, and assure that habitat avoidance and conservation measures are implemented.

3. El Paso County will ensure that implementation of Preble's meadow jumping mouse habitat restoration will be supervised by a qualified ecologist experienced in habitat restoration. This includes implementation of an approved integrated weed management plan.

4. El Paso County will include as a binding condition of project approval that annual monitoring of onsite restoration and offsite conservation and enhancement efforts, and management of noxious weeds be conducted. Monitoring will extend for at least three growing seasons (or until such a time as USACE and the Service determine that proposed revegetation has been successfully completed. Success criteria were described previously in Section 1.3, *Success Criteria for Temporary Impact Restoration and Compensatory Habitat Mitigation* section on page 11.

5. In the unlikely event a Preble's meadow jumping mouse or any other federally listed species is killed or injured during project activities, notify the Service's Colorado Field Office in Lakewood ((303) 236-4773) within ten (10) days.

The Service believes that the proposed action would adversely affect no more than 3.54 acres of Preble's meadow jumping mouse habitat, resulting in incidental take of no more than five Preble's meadow jumping mice. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action.

If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The USACE must immediately provide an explanation of the causes of the increased level of taking and review with the Service the need for possible modification of the reasonable and prudent measures.

3. CONSERVATION RECOMMENDATIONS

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

We have no conservation recommendations at this time.

4. REINITIATION NOTICE

This concludes formal consultation on proposed federal actions related to the Pine Creek Restoration Reach 2 in El Paso County, Colorado. Reinitiation of this consultation may be required if:

1. The amount or extent of incidental take is exceeded
2. New information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion
3. The agency action is subsequently modified in a manner that causes an adverse effect to the listed species or critical habitat that was not considered in this opinion
4. A new species is listed or critical habitat designated that may be affected by the action

If, at any time, incidental take exceeds the take authorized by this biological opinion, any operations causing such take must cease pending reinitiation. If the Service can be of any additional assistance, please contact Kristin Salamack of the Colorado Field Office by telephone at (303) 236-4748 or by email to kristin_salamack@fws.gov.

Sincerely,

Liisa Niva
Eastern Colorado Supervisor
Colorado Ecological Services Office

cc: Tim DeMasters, CORVUS

Reference: I:\Salamack\USFWS_Project Assignments\2023\0010148_USAFA_North Gate Permanent Water Quality Pond

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