

**Low Effect Habitat Conservation Plan
for Preble's Meadow Jumping Mouse
on the Kettle Creek Ranch
El Paso County, Colorado**

Prepared for:
U.S. Fish and Wildlife Service

On behalf of:
Vintage Companies

Prepared by:
SWCA Environmental Consultants

August 2012

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Prepared for

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EXECUTIVE SUMMARY

This Low Effect Habitat Conservation Plan for the Kettle Creek Ranch development in El Paso County, Colorado, has been prepared to accompany an application for an Endangered Species Act section 10(a)(1)(B) permit for the potential incidental take of the federally threatened Preble's meadow jumping mouse (*Zapus hudsonius preblei*). The intent of this Habitat Conservation Plan is to assure that the proposed project does not reduce the potential for survival and recovery of the mouse in the wild, as mandated by requirements of 50 CFR Part 17.22(b)(1)(iii).

Vintage Companies plans to develop the Kettle Creek Ranch property located on the northwest corner of Old Ranch Road and Chapel Ridge Drive on the north side of Colorado Springs. The plan will convert approximately 38 acres of land currently being used for horse boarding and grazing into a single family and multi-dwelling residential development. The lots will be constructed adjacent to tributaries of Kettle Creek, which is within known habitat for the mouse. A 0.262-acre area of upland Preble's meadow jumping mouse habitat will be removed as a result of the proposed project.

This Habitat Conservation Plan includes mitigation for the “take” of Preble’s meadow jumping mice and their habitat, including wetland and upland disturbances on the property. Approximately 1.601 acres of PMJM habitat would be created or enhanced on the property as mitigation for the 0.262 acre lost (a mitigation ratio of 6:1). Wetland, riparian, and upland habitats will be enhanced through drainage improvement projects, removal of horse grazing pressures, and plantings to providing high quality habitat for the mouse.

1.0 INTRODUCTION AND BACKGROUND

This Low Effect Habitat Conservation Plan (HCP) for the Kettle Creek Ranch development in El Paso County, Colorado, has been prepared to accompany an application for an Endangered Species Act (ESA) section 10(a)(1)(B) permit for the potential incidental take of the federally threatened Preble's meadow jumping mouse (*Zapus hudsonius preblei*) (PMJM). The potential “take” is associated with the otherwise lawful construction of residential housing.

1.1 OVERVIEW/BACKGROUND

Vintage Companies plans to develop the Kettle Creek Ranch property located on the northwest corner of Old Ranch Road and Chapel Ridge Drive on the north side of Colorado Springs (Figures 1 and 2). The plan will convert approximately 38 acres of land currently being used for horse boarding and grazing into a single family and multi-dwelling residential development. The lots will be constructed adjacent to tributaries to Kettle Creek, which is within known habitat for the PMJM.

This HCP has been proposed to minimize the potential “take” of PMJM within the project boundary by enhancing and restoring habitat along a tributary of Kettle Creek. The intent of this HCP is to assure that the proposed project does not reduce the potential for survival and recovery of the PMJM in the wild, as mandated by requirements of 50 CFR Part 17.22(b)(1)(iii).

Vintage Companies has already constructed residences on an adjacent property located east of Chapel Ridge Drive. A stormwater detention pond was created at the intersection of Old Ranch Road and Chapel Ridge Drive to capture and detain the additional runoff from the new neighborhood. Prior to construction of the detention pond, Vintage Companies consulted with the U.S. Fish and Wildlife Service (Service) and U.S. Army Corps of Engineers (Corps) due to potential impacts to PMJM habitat and jurisdictional waters of the U.S. The Service issued permit PRT-704930 and subpermit sp98-40.99 for the potential incidental take of PMJM. In 2000, the Corps issued Vintage Companies a Clean Water Act Section 404 permit (2000-00535) for construction of the detention pond. The detention pond impacted approximately 1.02 acres of jurisdictional waters of the U.S. which was mitigated by wetland creation and enhancement as described in *Mitigation Plan for Waters of the United States on a Portion of the Kettle Creek Ranch Property* (SWCA 2000a) and *Final Tree Mitigation and Noxious Weed-Control Plan for the Kettle Creek Ranch Detention Pond Project* (SWCA 2003).

As Vintage Companies moves forward with the next phase of development, they are reinitiating consultation with the Service for additional impacts to PMJM habitat within the Kettle Creek Ranch property. SWCA met with Adam Misztal of the Service and Vintage Companies on November 13, 2008, to assess the limits of development relative to potential PMJM habitat and to identify new mitigation areas that would enhance the previous mitigation areas created as a result of previous actions. Addition meetings between SWCA and the Service were conducted on May 5, 2011, and February 14, 2012. Vintage Companies and SWCA have been in communication with the Service throughout the development of the conservation measures.

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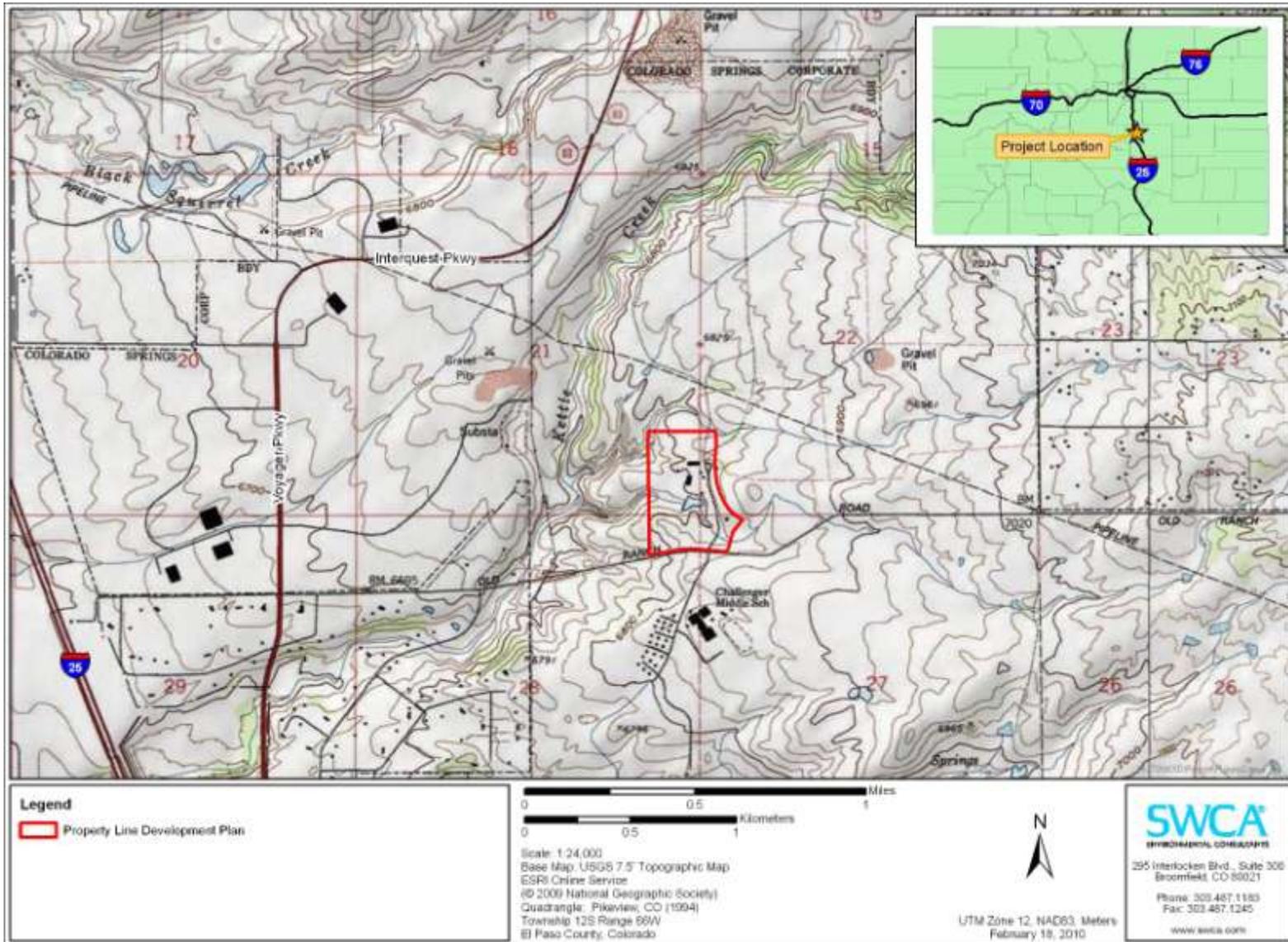


Figure 1. Project Location.

Kettle Creek Ranch
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Figure 2. Kettle Creek Property Development Plan.

1.2 PERMIT HOLDER/PERMIT DURATION

The section 10(a)(1)(B) permit will authorize the incidental take of PMJM along a tributary to Kettle Creek within the area described herein by Vintage Companies (Applicants). The permit will cover the activities associated with the proposed development along Kettle Creek by all officers, members, employees, agents, contractors, and licensees of the Applicants. The Applicants accept and agree to the responsibility for adhering to the requirements and conditions of the proposed incidental take permit (i.e., section 10(a)(1)(B) permit) and for implementing and managing the mitigation plan contained in this HCP.

The duration of the section 10(a)(1)(B) permit will be long enough to allow full implementation of the preferred action and conservation measures. It will allow incidental take of PMJM through the disturbance of actual or potential PMJM habitat during the determined time frame and within the geographical boundaries identified in this HCP. After expiration of the permit, any potential take within the said geographical boundaries not specifically covered by this application would require authorization by the Service, possibly through a subsequent permit application under the ESA. However, the terms and conditions contained in the HCP shall not expire if additional take occurs through a subsequent permit and the terms and conditions of the HCP shall be subject to the enforcement authority of section 11(b) of the ESA.

The duration of the section 10(a)(1)(B) permit is 20 years from the date of issuance.

1.3 PERMIT BOUNDARY/COVERED LANDS

The Kettle Creek Property is located in Section 21 of Township 12 South, Range 66 West. Two tributaries of Kettle Creek extend through the property. Impacts due to housing development would occur only along the southern tributary (Figure 2). Mitigation for these impacts would occur in the southern tributary, immediately upstream from the area of impact.

1.4 SPECIES TO BE COVERED BY PERMIT

The federally threatened PMJM is the only "covered species" related to the section 10(a)(1)(B) permit. PMJM is also listed as threatened by the state of Colorado.

1.5 REGULATORY FRAMEWORK

1.5.1 Federal Endangered Species Act

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibits the "take" of endangered and threatened species, respectively, without special exemption. "Take" is defined as to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct." Harm is further defined by the Service to include "significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering." Harass is defined by the Service as "intentional or negligent actions that create the likelihood of injury to listed species by annoying them 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 an otherwise lawful activity.”

Pursuant to section 11(a) and (b) of the ESA, any person who knowingly violates this section 9 of the ESA or any permit, certificate, or regulation related to section 9, may be subject to civil penalties of up to \$25,000 for each violation or criminal penalties up to \$50,000 and/or imprisonment of up to one year.

Individuals and State and local agencies proposing an action that is expected to result in the “take” of federally listed species are encouraged to apply for an incidental take permit under section 10(a)(1)(B) of the ESA to be in compliance with the law. Such permits are issued by the Service when “take” is not the intention of, and is incidental to, otherwise legal activities. An application for an incidental take permit must be accompanied by an HCP. The regulatory standard under section 10(a)(1)(B) of the ESA is that the effects of authorized incidental take must be minimized and mitigated to the maximum extent practicable. Under section 10(a)(1)(B) of the ESA, a proposed project also must not appreciably reduce the likelihood of the survival and recovery of the species in the wild, and adequate funding for a plan to minimize and mitigate impacts must be ensured.

Section 7 of the ESA requires Federal agencies to ensure that their actions, including issuing permits, do not jeopardize the continued existence of listed species or destroy or adversely modify listed species’ critical habitat. “Jeopardize the continued existence of...” pursuant to 50 CFR 402.2, means 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. Issuance of an incidental take permit under section 10(a)(1)(B) of the ESA by the Service is a Federal action subject to section 7 of the ESA. As a Federal agency issuing a discretionary permit, the Service is required to consult with itself (i.e., conduct an internal consultation). Delivery of the HCP and a section 10(a)(1)(B) permit application initiates the section 7 consultation process within the Service.

The requirements of section 7 and section 10 substantially overlap. Elements unique to section 7 include analyses of impacts on designated critical habitat, analyses of impacts on listed plant species, if any, and analyses of indirect and cumulative impacts on listed species. Cumulative effects are effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area, pursuant to section 7(a)(2) of the ESA. The action area is defined by the influence of direct and indirect impacts of covered activities. The action area may or may not be solely contained within the HCP boundary. These additional analyses are included in this HCP to meet the requirements of section 7 and to assist the Service with its internal consultation.

1.5.2 The Section 10(a)(1)(B) Process – Habitat Conservation Plan Requirements and Guidelines

The Section 10(a)(1)(B) process for obtaining an incidental take permit has three primary phases: 1) the HCP development phase; 2) the formal permit processing phase; and 3) the post-issuance phase.

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Low Effect HCP

During the HCP development phase, the project applicant prepares a plan that integrates the proposed project or activity with the protection of listed species. An HCP submitted in support of an incidental take permit application must include the following information:

- impacts likely to result from the proposed taking of the species for which permit coverage is requested;
- measures that will be implemented to monitor, minimize, and mitigate impacts; funding that will be made available to undertake such measures; and procedures to deal with unforeseen circumstances;
- alternative actions considered that would not result in take; and
- additional measures Service may require as necessary or appropriate for purposes of the plan.

The HCP development phase concludes and the permit processing phase begins when a complete application package is submitted to the appropriate permit-issuing office. A complete application package consists of 1) an HCP, 2) an Implementing Agreement (IA) if applicable, 3) a permit application, and 4) a \$100 fee from the applicant. The Service must also publish a Notice of Availability of the HCP package in the Federal Register to allow for public comment. The Service also prepares an Intra-Service Section 7 Biological Opinion; and prepare a Set of Findings, which evaluates the Section 10(a)(1)(B) permit application as in the context of permit issuance criteria (see below). An Environmental Action Statement, Environmental Assessment, or Environmental Impact Statement serves as the Services' record of compliance with the National Environmental Policy Act (NEPA), which has gone out for a 30-day, 60-day, or 90-day public comment period. An implementing agreement is required for HCPs unless the HCP qualifies as a low-effect HCP. A Section 10(a)(1)(B) incidental take permit is granted upon a determination by the Service that all requirements for permit issuance have been met. Statutory criteria for issuance of the permit specify that:

- the taking will be incidental;
- the impacts of incidental take will be minimized and mitigated to the maximum extent practicable;
- adequate funding for the HCP and procedures to handle unforeseen circumstances will be provided;
- the taking will not appreciably reduce the likelihood of survival and recovery of the species in the wild;
- the applicant will provide additional measures that the Service requires as being necessary or appropriate; and
- the Service has received assurances, as may be required, that the HCP will be implemented.

During the post-issuance phase, the Permittee and other responsible entities implement the HCP, and the Service monitors the Permittees' compliance with the HCP as well as the long-term progress and success of the HCP. The public is notified of permit issuance by means of the Federal Register.

1.5.3 National Environmental Policy Act

The purpose of the National Environmental Policy Act (NEPA) is two-fold: to ensure that Federal agencies examine environmental impacts of their actions (in this case deciding whether to issue an incidental take permit) and to utilize public participation. NEPA serves as an analytical tool on direct, indirect, and cumulative impacts of the proposed project alternatives to help the Service decide whether to issue an incidental take permit (ITP or section 10(a)(1)(B) permit). NEPA analysis must be done by the Service for each HCP as part of the incidental take permit application process.

1.5.4 National Historic Preservation Act

All Federal agencies are required to examine the cultural impacts of their actions (e.g. issuance of a permit). This may require consultation with the State Historic Preservation Office (SHPO) and appropriate American Indian tribes. All incidental take permit applicants are requested to submit a Request for Cultural Resources Compliance form to the Service. To complete compliance, the applicants may be required to contract for cultural resource surveys and possibly mitigation.

1.5.5 Other Relevant Laws and Regulations

Other relevant laws to the ITP process include the Migratory Bird Treaty Act, Clean Water Act, State Endangered Species Act, California Environmental Quality Act, and other state and local legislation.

2.0 PROJECT DESCRIPTION AND ACTIVITIES COVERED BY PERMIT

The project includes residential development of the Kettle Creek Ranch property north of Old Ranch Road and west of Chapel Ridge Drive. There will be two sections of housing separated by the southern tributary of Kettle Creek (Figure 2). The northern neighborhood will include 60 single family home lots on 33 acres accessed from a proposed new road off of Chapel Ridge Drive. The southern area will consist of 16 acres of multi-dwelling housing accessed from a new road off of Old Ranch Road. The existing horse boarding facility and all horses will be removed from the property. The new roads for the neighborhoods would not cross the Kettle Creek tributaries; the northern residential section would be accessed from a new road extending west of Chapel Ridge Drive and the southern residential section would be accessed from a new entrance along the north side of Old Ranch Road.

The section 10(a)(1)(B) permit would cover all activities related to the construction and maintenance of the planned residential development on the Kettle Creek property that may result in “take” of PMJM and its habitat. This includes all construction activities as well as removal of habitat for the housing project and any related infrastructure (e.g., roads and culverts), any erosion control necessary following construction, and mowing of landscaped areas. A 0.262-acre area of PMJM upland habitat lies within the development boundary and would be permanently removed due to the development on the southern side of the southern tributary of Kettle Creek (Photograph 1).



Photograph 1. Area of PMJM upland habitat impact.

An existing gravel ranch road extends from Old Ranch Road northward through the property, bisecting PMJM habitat on the southern tributary. This ranch road crosses the southern tributary and is used to access the existing horse boarding facility and a single residence. A small culvert allows the tributary to continue to drain under the road. Since the proposed project would provide new access to the development outside of existing jurisdictional drainages, the existing ranch road would no longer be needed. However, the existing ranch road would be used during construction of the project before it is removed. The road and culvert removal and subsequent revegetation would serve as compensatory mitigation for the loss of 0.262 acre of PMJM upland habitat. The remaining project footprint is located outside of PMJM habitat.

3.0 ENVIRONMENTAL SETTING AND COVERED SPECIES

3.1 ENVIRONMENTAL SETTING

The Kettle Creek Ranch property is located on the edge of the suburbs north of Colorado Springs in El Paso County, Colorado. The property is approximately 1.5 miles east of Interstate 25 (I-25) along the north side of Old Ranch Road. The Black Forest residential community and regional park is located approximately 1 mile northeast of the property; the U.S. Air Force Academy is located just west of I-25; and Pike National Forest begins approximately 7 miles to the west continues into the Front Range of the Rocky Mountains.

3.1.1 Existing Land Use

The property is located in a relatively rural area that is becoming increasingly developed with new suburban neighborhoods. Existing land uses adjacent to the property include residential development immediately south of Old Ranch Road and immediately east of Chapel Ridge Drive. The land immediately north and west of the property is undeveloped.

The property is current used as a private horse riding and boarding facility and intensive grazing has occurred throughout the majority of the property, including all upland areas adjacent to the two tributaries to Kettle Creek that pass through and along the property. Stables, other ranch structures, and outdoor horse enclosures are present. The extensive grazing within and surrounding the property, in addition to the increasing development upstream of the property, has created a substantial amount of erosion within the stream channels that occur within the property, as evidenced by heavily-incised stream channels. Additional infrastructure on the property includes parking lots for the stable operations and a pump house which supplies water to the small pond located immediately east of the access road leading from Old Ranch Road.

3.1.2 Climate

The average annual maximum temperature in the Colorado Springs area is 62°F and the average annual minimum temperature is 36°F (Western Regional Climate Center 2009). In summer, temperatures range from 55 to 82°F, with an average of 68°F. In winter, temperatures range from 18 to 44°F, with an average of 32°F. Average annual snowfall is 40 inches and total average annual precipitation is 16 inches. Most precipitation falls as rain in late summer into early fall.

3.1.3 Topography/Soils

The property is located on the eastern edge of the Front Range of the Rocky Mountains. Elevations range from approximately 6,750 to 6,825 feet above mean sea level, with uplands gently sloping down to the Kettle Creek drainage. Two soil units are mapped for the property (Natural Resources Conservation Service 2010): Peyton-Pring complex, 8 to 15 percent slopes, and Stapleton-Bernal sandy loams, 3 to 20 percent slopes. A majority of the property is Peyton-Pring complex with some Stapleton-Bernal sandy loam on the west side of the property, particularly along the drainages. These soils are generally deep and developed from arkosic alluvium and residuum, consisting of well drained sandy loams with a moderate to high capacity to move water and neutral to slightly alkaline reactivity.

3.1.4 Hydrology

The property lies within the extreme northeastern portion of the Fountain watershed (HUC 11020003). This watershed is approximately 900 square miles and encompasses all or portions of eight municipalities and three counties. Kettle Creek flows southwest from the Black Forest to areas adjacent to the western edge of the property and empties into Monument Creek which flows south to Fountain Creek and ultimately drains into the Arkansas River at the City of Pueblo in Pueblo County. Two unnamed tributaries of Kettle Creek pass through the property (previously referred to in this HCP as the “northern” and “southern” tributaries). These tributaries are primarily fed by stormwater sheet flow from surrounding roads and neighborhoods. Pondered areas, vegetated with wetland species, have developed along the southern tributary due to a dam and backflow at a faulty culvert. A stormwater detention basin,

as described in Section 1.1 of this HCP, is located on the southeast corner of the property. The property lies outside of the 100-year and 500-year flood zones mapped by the Federal Emergency Management Agency (FEMA 1997).

3.1.5 Vegetation

Habitat on the property consists of open grasslands, narrow riparian corridors along the drainages, and wetlands along the bottom of the drainages. The upland area around the horse facility is dominated by grass species including blue grama (*Bouteloua gracilis*), buffalograss (*Buchloe dactyloides*), wheatgrass (*Agropyron* spp.), mountain muhly (*Muhlenbergia Montana*), smooth brome (*Bromus inermis*), and big bluestem (*Andropogon gerardii*). Some shrubs, such as Gambel oak (*Quercus gambelii*) and mountain mahogany (*Cercocarpus montanus*), are present along with scattered soapweed yucca (*Yucca glauca*) and prickly pear (*Opuntia* sp.). Most of the uplands have been intensely grazed by horses as evidenced by the low biomass observed on herbaceous and shrubby species. However, near the drainages there are a few areas that have not been extensively grazed due to the thick vegetation (i.e., Gambel oak), steeper terrain, and fencing along the upper parts of the drainages that has discouraged horse grazing. Patches of noxious weeds, including diffuse knapweed (*Centaurea diffusa*) and common mullein (*Verbascum thapsus*), are scattered throughout the uplands, as well as other weedy species such as kochia (*Bassia scoparia*).

The high banks above the two tributaries are dominated by Gambel oak, mountain mahogany, thinleaf alder (*Alnus incana* ssp. *tenuifolia*), and ponderosa pine (*Pinus ponderosa*) trees. The stream banks and bottom are dominated by coyote willow (*Salix exigua*), crack willow (*S. fragilis*), peachleaf willow (*S. amygdaloides*), eastern cottonwood (*Populus deltoides*), green ash (*Fraxinus pennsylvanica*), quaking aspen (*Populus tremuloides*), chokecherry (*Prunus virginiana*), western snowberry (*Symphoricarpos occidentalis*), and wild rose (*Rosa* spp.). The existing detention basin and ponded areas along the drainage are vegetated with wetland indicator species such as narrowleaf cattail (*Typha latifolia*), coyote willow, softstem bulrush (*Schoenoplectus tabernaemontani*), curly dock (*Rumex crispus*), American licorice (*Glycyrrhiza lepidota*), wetland grasses, sedges (*Carex* spp.), and rushes (*Juncus* spp.).

3.2 PREBLE'S MEADOW JUMPING MOUSE

Meadow jumping mice (*Z. hudsonius*) have long tails, large hind feet, and long hind legs and are found throughout Canada and much of the United States. The PMJM is a subspecies of meadow jumping mouse found in parts of Wyoming and Colorado. The PMJM has coarser hair on its back along with a distinct, dark stripe that differentiates it from other subspecies.

3.2.1 Status

The PMJM was listed as threatened in 1998 (63 FR 26517) due to threats from habitat loss and degradation and in 2003 Critical Habitat was designated in portions of Colorado and Wyoming (68 FR 37275). In December 2003, Coloradans for Water Conservation and Development and the State of Wyoming's Office of the Governor submitted petitions to remove PMJM from the Federal List of Threatened and Endangered Wildlife and Plants based on data indicating PMJM was not a valid subspecies and new data suggesting the species was no longer threatened or endangered. After its' review, the Service found that the delisting was warranted (70 FR 5404)

based on a taxonomic revision suggested by Ramey et al. (2004), which concluded that PMJM should be synonymized with a neighboring subspecies. However, additional genetic analysis concluded that PMJM should not be synonymized with neighboring subspecies of meadow jumping mice (King et al. 2006; Cryan 2005) and the comment period on the proposed delisting was extended. During that time, the Service reviewed comments submitted by peers and the public as well as a report that analyzed the genetic data (Arbogast et al. 2006). After review of all available information, the Service determined that the taxonomic revision for the PMJM suggested in their proposed delisting rule (70 FR 5404) was no longer appropriate.

In 2008, the final rule was published that amended the listing for the PMJM and specified over what portion of its range the subspecies is threatened. The rule stated that PMJM is not threatened throughout all of its range; populations in Wyoming are more widespread and threats to the subspecies less severe than those known at the time of the 1998 listing. The species' range in Colorado represents a significant portion of the current range where the subspecies should retain its threatened status in order to prevent PMJM from becoming endangered. The portion of Colorado west of 103 degrees 40 minutes West, north of 38 degrees 30 minutes North, and east of 105 degrees 50 minutes West was defined as the significant portion of the range of the subspecies.

In December 2010, the Service revised the designated Critical Habitat located in Boulder, Broomfield, Douglas, El Paso, Jefferson, Larimer, and Teller Counties in Colorado. Critical Habitat was designated along Kettle Creek near the project area. Kettle Creek is in Critical Habitat Unit 11: Monument Creek, El Paso County, Colorado (75 FR 78430). The western boundary of Critical Habitat along Kettle Creek is at the property boundary of the U.S. Air Force Academy and the eastern boundary is upstream at the creek's intersection with a road (39 00 07N 104 45 24W; T.12S., R.66W., Sec. 15). Critical Habitat equals the stream plus 120 meters (m) (394 feet) on each side. Critical Habitat also includes an unnamed tributary from its confluence with Kettle Creek (38 59 06N 104 46 55W, T12S, R66W, Section 21) upstream (to 38 59 14N 104 46 19W, T12S, R66W, Section 22). Critical Habitat along the tributary equals the stream plus 110 m (361 feet) on each side. The project area is not within designated PMJM Critical Habitat.

3.2.2 Distribution

The PMJM is found along the foothills in southeastern Wyoming, southward along the eastern edge of the Front Range of Colorado to Colorado Springs in El Paso County (74 FR 52065). The North Platte River at the City of Douglas in Wyoming marks the northernmost confirmed location for the PMJM. Specimens from Colorado Springs mark the southernmost documented location of the subspecies. In Colorado, the distribution of the PMJM forms a band along the eastern edge of the Front Range from Wyoming southward to Colorado Springs. The eastern boundary for PMJM in Colorado is likely defined by the dry shortgrass prairie and the western boundary appears related to elevation along the Front Range. The PMJM is generally found at elevations between 4,650 to 7,600 feet.

PMJM was historically documented in Adams, Arapahoe, Boulder, Denver, Douglas, El Paso, Elbert, Jefferson, Larimer, and Weld counties in Colorado, and Albany, Laramie, Platte, Goshen, and Converse counties in Wyoming. When listed in 1998, PMJM was known to occur in seven counties in Colorado (Boulder, Douglas, El Paso, Elbert, Jefferson, Larimer, and Weld counties)

and two counties in Wyoming (Albany and Laramie counties). Due to increased trapping efforts since 1998, the PMJM is now known to occur in portions of Albany, Laramie, Platte, and Converse counties in Wyoming; and in portions of Boulder, Douglas, El Paso, Elbert, Jefferson, Larimer, and Weld counties in Colorado.

3.2.3 Habitat Characteristics/Use

PMJM habitat generally consists of well-developed riparian vegetation adjacent to grassland communities and a nearby water source (Service 2009). PMJM commonly use riparian vegetation immediately adjacent to a stream, but also include areas of low moisture, dry gulches, agricultural ditches, wet meadows, and seeps within close proximity to a watershed. Hydrologic regimes that support PMJM habitat range from large perennial rivers, such as the South Platte River, to small drainages only 3 to 10 feet wide. Areas with a wide diversity of plant species determine PMJM abundance, including a high density and cover of both shrubs and grasses (Meaney et al. 1997). Riparian vegetation used by PMJM typically consists of a vertical shrub canopy (most often willows [*Salix* spp.]) with a dense understory of grasses and limited forb cover (Bakeman 1997; Grunau et al. 1999; Keinath 2001; Meaney et al. 2003; Schorr 2003; Shenk and Eussen 1999). Although PMJM rarely use adjacent upland areas, these areas may be used for feeding, resting, and/or hibernation (Dharman 2001; Ryon 1999; Schorr 2001; Shenk and Sivert 1999). In addition, upland vegetation, such as Gamble oak and western snowberry, provides further protection to riparian habitats from disturbance and assists in supporting normal hydrological functions of rivers, streams, and floodplains (Pearce et al. 1998).

Native wetland vegetation near streams and creeks is important for PMJM use, which generally includes wetland shrubs such as narrowleaf cottonwood (*Populus angustifolia*), alder, and willows, and native grasses and grass-like species including sedges and rushes (Trainor, Shenk, et al. 2007). PMJM habitat affinities include areas with high vegetation cover (66%), low shrubs (0.8 m), close proximity to trees (2.8 m), and high plant species richness (5.9 species) (Meaney et al. 1997). Schorr (2001) found that PMJM densities were positively correlated to vertical vegetation density, total grass ground cover, and total number of downed woody debris between 20 and 30 centimeters (cm) in diameter; however, PMJM densities were negatively correlated with the number of large canopy trees in the area. Shade created by an overstory of large trees may further limit establishment of wetland shrubs, thus providing unsuitable vertical shrub cover. Trainor, Shenk, et al. (2007) observed that PMJM high-use areas were closer to the center of creek beds (<25 m) and positively associated with shrub, grass, and woody debris cover. In addition, high-use areas had a greater proportion of wetland shrub and grass cover compared to non-use areas, and grass cover was a stronger predictor than forb cover.

Shrub cover is critical in PMJM habitat for providing shelter, protection, and food. PMJM construct small (~9 cm in diameter) day nests composed of grasses, forbs, sedges, rushes, and other available plant material that individuals use for around three weeks (Bain and Shenk 2002; Ryon 2001; Schorr 2001). The nests are similar to those described for other meadow jumping mice, and are typically found under debris at the base of shrubs and trees. More substantial underground nests are used for rearing young. Hibernation nests of the PMJM have been located both within and outside of the 100-year floodplain of streams and are often located under riparian shrubs (Schorr 2001; Shenk and Sivert 1999); hibernation typically begins in September and ends in mid-May (Meaney et al. 2003). Shrub cover is an excellent source of woody debris

and surface litter, which can enhance forest-floor vertebrate populations by providing refugia and reducing predation risks (Butts and McComb 2000; Manning and Edge 2004; Moses and Boutin 2001). Woody debris inclusion should be considered in PMJM management areas (Trainor, Wilson, et al. 2007), especially when shrub cover requires several years to establish.

PMJM diet consists primarily of insects and fungus after emerging from hibernation; shifts to fungus, moss, grain seeds, and fleshy fruits during midsummer (July–August); then shifts back to insects again in September before hibernation (Smith et al. 2004). Microclimates created by shrub cover provide favorable conditions (e.g., increased soil moisture, relative humidity, and cooler ambient temperatures) that promote grass and forb establishment and sustain terrestrial invertebrate populations (Harris 1985; Trainor, Shenk, et al. 2007). PMJM also consume ectomycorrhizal fungus primarily from the genus *Endogone* (Orrock et al. 2003; Shenk 1999), which is commonly found on the roots of woody vegetation, such as shrubs (Pyare and Longland 2001). Through the consumption and defecation of fungal spores, PMJM disperse fungus throughout high affinity areas (e.g., near shrubs that promote additional fungi growth), thus promoting a positive feedback loop and providing a healthier shrub community (Trainor, Wilson, et al. 2007).

3.2.4 Occurrences within the Project Area

PMJM are known to occur within the two on-site Kettle Creek tributaries. SWCA Environmental Consultants conducted presence/absence surveys (following Service’s 1999 protocols) on and adjacent to the property between 8 and 23 June, 1999 (SWCA 1999, 2000). The surveys resulted in the capture of 47 PMJM with a maximum of 9 mice trapped on a single visit. Trapping transects were located along 2,500 linear feet of the southern tributary of Kettle Creek, approximately 1,600 linear feet of the northern tributary, and 700 linear feet of Kettle Creek itself.

One transect was located along the southern tributary near the area of proposed impact and included 29 traps. During the three nights of trapping, only one PMJM was captured along this transect. Most of the other PMJM were trapped downstream of the area of impact where better quality habitat is located. Capture locations appeared to positively correlate with complex vegetative wetland areas composed of dense and tall patches of coyote willow, sedges, western snowberry, and various grasses. Little to no captures occurred in arid areas, heavily grazed areas, and areas composed primarily of cattails.

In addition to the presence/absence surveys, a vegetation-based evaluation method was used in rating potential habitat values for PMJM on the property (SWCA 2000b). SWCA developed this habitat rating system to compare overall habitat suitability between drainages within PMJM range and evaluate potential impacts on PMJM populations on the property. The ranking system provided separate ratings for riparian areas and the associated adjacent upland areas. Both the riparian and upland areas were assigned a rating of 0 to 6 (with 0 offering no suitability to PMJM and 6 providing the highest value) based on known habitat preferences, such as presence of open water and a high density of herbaceous vegetation with a well developed shrub overstory (Bakeman 1997; Grunau et al. 1999).

Based on the rating system, the deeply incised portions of the on-site drainages provide high-quality riparian PMJM habitat (rated 5 to 6). The best riparian habitat was found in the southern

tributary, downstream from the existing entrance road to the property. These areas support dense stands of willow with an understory of wetland forbs and grasses. Low-quality riparian habitat (rated 1) was found in the southern tributary near the entrance road. Some upland areas with dense Gambel oak and tall, mature grasses along the southern tributary were given a rating of 4 (medium-quality upland habitat), but most uplands were rated as low quality (rated 1 or 2) due to lack of vegetation and grazing pressure.

PMJM habitat quality in many of the areas within and adjacent to Kettle Creek was rated low during the survey in 2000. This indicated that although the Service generally considers areas within 300 feet of Kettle Creek tributaries to be PMJM habitat, much of the area within this buffer is not suitable habitat and has little to no value for PMJM. The Service concurred that overgrazed areas did not represent PMJM habitat due to the lack of vegetation during a site visit with SWCA. The survey also determined that habitat for PMJM extended upstream along the southern tributary to the ranch road leading from Old Ranch Road (the Service and Corps verified suitable PMJM habitat upstream of this access road in the form of clearance letters, a Biological Opinion [dated 12-11-2000], and Corps permit [#2000 0035]).

4.0 POTENTIAL BIOLOGICAL IMPACTS/TAKE ASSESSMENT

4.1 DIRECT AND INDIRECT IMPACTS

Approximately 10.65 acres of PMJM habitat are mapped within the project area (Table 1). A portion of the proposed development overlaps high-quality PMJM habitat within 300 feet of the southern tributary of Kettle Creek. The two lots proposed for development in this area would directly impact 0.262 acre of upland PMJM habitat dominated by low-lying herbaceous grasses, scattered snowberry shrubs, and a few oak trees (Figure 3). The rest of the construction area is low-quality upland habitat that is unlikely to support PMJM. Mortality of PMJM individuals could occur during construction activities and destruction of PMJM habitat. After construction, mortality associated with pets (primarily house cats) and stress and disturbance associated with pedestrian traffic would constitute the indirect project impacts.

Table 1. PMJM Habitat in the Project Area.

Project Area	Action	Acres
Undisturbed PMJM Habitat	None	10.270
PMJM Upland Habitat	Permanent removal for development	0.262
PMJM Wetland and Upland Habitat	Temporary disturbance during mitigation	0.118
Total PMJM Habitat		10.650

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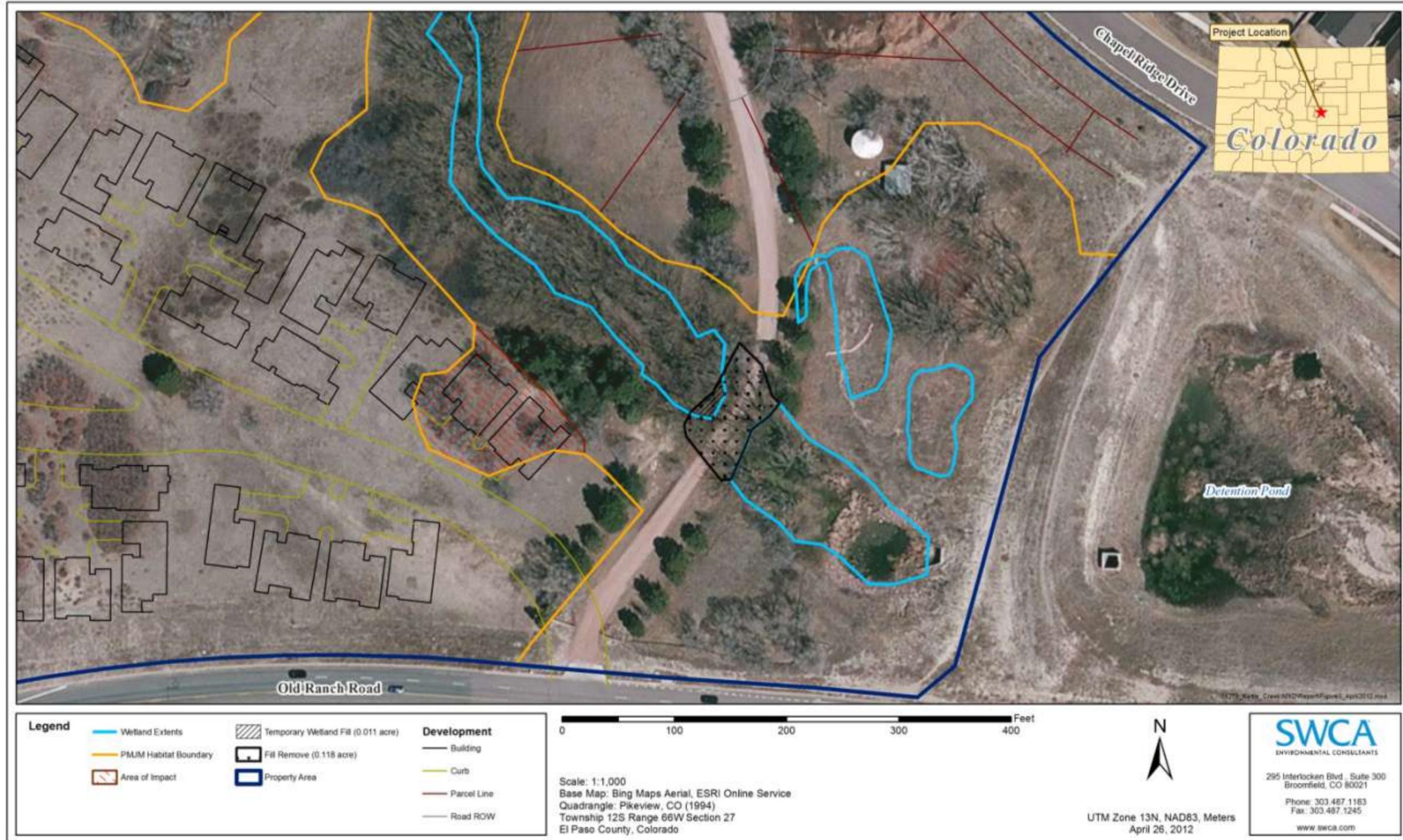


Figure 3. PMJM habitat impacts in the project area.

Additional direct impacts of individual PMJM may occur due to implementation of proposed PMJM mitigation. The removal of the existing ranch road and culvert would cause short-term direct impacts to approximately 0.118 acre of low-quality wetland and upland PMJM habitat (see Figure 3). The embankments of the ranch road (0.107 acre) along with a small portion of wetland habitat (0.011 acre) would be temporarily disturbed during the complete removal of the ranch road and culvert at the southern tributary crossing. The removal of fill would be conducted to match the slope of adjacent undisturbed drainage embankments and wetland substrate elevations. Fill removal areas would be reclaimed per the proposed mitigation plan.

Short-term indirect impacts from construction in areas adjacent to PMJM habitat may include increased sedimentation and erosion and introduction of noxious weeds which can alter the composition, structure, or density of riparian vegetation. Long-term indirect impacts from the change in land use to residential development could include increased disturbance from human presence, increased impervious cover (leading to increased flows from stormwater runoff), alteration of the natural flora/fauna communities, and increased potential for catastrophic fire because of fire suppression activities typically associated with human development (a higher density of vegetation conducive to higher fuel load and fire intensity) (Grunau et al. 1999). Increased runoff from residential yards could also introduce herbicides and pesticides into the drainage; however, the land would be graded so that flows are directed in the following manner: 1) for the portion of the development south of the southern tributary, stormwater runoff would be directed to the south along Old Ranch Road, and 2) for the portion of the development north of the southern tributary, stormwater runoff would be directed to the north and be treated at a detention pond located along the western border of the property. The redirection of sheet flows would minimize secondary and indirect impacts to down-gradient waters associated with Kettle Creek. However, stormwater treated at the detention pond would flow into the northern tributary and ultimately into the main stem of Kettle Creek; stormwater directed away from the southern tributary within the southern portion of the proposed development would also ultimately flow into Kettle Creek by redirection along Old Ranch Road.

The proposed project mitigations may have a positive impact to PMJM populations by the removal of grazing and improving habitat quality in the Kettle Creek drainage. Removing grazing from riparian areas has been shown to increase small mammal abundance and richness (Giuliano and Homyack 2004). Removal of the ranch road and culvert would restore the connectivity of PMJM habitat in Kettle Creek. Removing the culvert would eliminate the ponding upstream of the ranch road, allowing approximately 0.310 acre of wetland and riparian habitat to be enhanced into better quality PMJM habitat (see Section 5.0). The removal of the perched culvert would reduce the velocity of water leaving the outfall and help prevent further scouring of the southern tributary stream channel.

4.2 ANTICIPATED TAKE OF PMJM

The project is anticipated to result in “take” (e.g. harassment, harm, injury, or mortality) of PMJM due to construction activities, loss of habitat, and increased human presence within the project area. According to a 5 year study by Schorr (2003), PMJM habitat supports approximately 6.7 mice per acre. Grunau et al. (1999) state that PMJM use upland habitat

30% of the time. Therefore, removal of 0.262 acre of upland PMJM habitat can be expected to result in the take of 0.53 PMJM.

4.3 EFFECTS ON CRITICAL HABITAT

Critical Habitat is proposed along Kettle Creek (74 FR 52065) and the revision of Critical Habitat is currently being reviewed by the Service. The tributaries within the Kettle Creek Ranch boundary are not part of the proposed critical habitat. Stormwater runoff resulting from the development would be directed in one of two directions, as discussed in Section 4.1 above, both which would ultimately flow into Kettle Creek to the west of the property. Stormwater collected in the northern portion of the property would be treated at a detention pond; stormwater along the southern portion of the property would be directed along Old Ranch Road. Although runoff would be redirected from the property's southern tributary, thus avoiding additional erosion and sedimentation within that tributary and points downstream, the redirected volume of water would provide increased flows to Kettle Creek during storm/runoff events.

4.4 CUMULATIVE IMPACTS

Throughout its range, PMJM has been impacted by human development and human presence, leading to its ESA listing. Housing and commercial development, as well as grazing, in the project vicinity has already led to habitat loss and degradation. Development in the vicinity continues now and in the reasonably foreseeable future, cumulatively impacting PMJM and its habitat. The proposed project would add to these threats to PMJM through development of land adjacent to a drainage occupied by PMJM and through the direct loss of a small area of PMJM habitat. The impact of each project may be minor, but are collectively significant over time.

By implementing the proposed mitigation, existing PMJM habitat on the property will be improved from the current status. The mitigation area is currently low quality PMJM habitat. Through mitigation, the quality of the habitat would increase and would link adjacent areas of higher quality PMJM habitat. Overall, the project, including its mitigation plan, will ultimately improve portions of habitat along a tributary of Kettle Creek through habitat enhancement and restoration, thereby creating better quality and availability of habitat for PMJM.

5.0 CONSERVATION PROGRAM

Due to potential effects to PMJM and its habitat in the project area, the Applicants have prepared a conservation program and mitigation plan that is intended to offset impacts.

5.1 BIOLOGICAL GOALS AND OBJECTIVES

The Applicants' primary goal of the conservation program and mitigation plan is to conserve PMJM habitat and minimize PMJM habitat impacts during project development. The quality of PMJM riparian habitat is associated with proximity to open water, high density herbaceous

vegetation adjacent to a water source, and a well established vertical shrub overstory, while PMJM habitat quality in upland areas is dependent upon adjacency to riparian PMJM habitat (Bakeman 1997; Grunau et al. 1999; Schorr 2003). In the project area, high-quality occupied PMJM habitat exists within the southern tributary of Kettle Creek (SWCA 1999, 2000), downstream of the existing ranch road. Previous mitigations and the construction of the detention pond has created PMJM habitat up gradient of the existing ranch road. PMJM habitat between these two areas has either been heavily grazed, converted to road, or compromised by surface water inundation. These actions have resulted in a decreased quality of riparian habitat along the southern tributary that exhibits three types of degradation: 1) habitat devoid of essential vegetation cover, 2) a habitat with reduced species abundance, or 3) an inundated riparian community that lowers PMJM utilization. To address habitat quality and potential PMJM connectivity along the southern tributary of Kettle Creek, the conservation program and mitigation plan has identified the following objectives:

- Re-establish and protect hydrological properties that are conducive to wetland establishment in the riparian corridor along the southern tributary of Kettle Creek.
- Expand and establish habitat corridors to increase connectivity between fragmented high-quality habitats along the southern Kettle Creek tributary.
- Manage the mitigated area and monitor the overall health through the development of a management plan and preparation of annual monitoring reports on the restoration and enhancement efforts to benefit PMJM.

The objective of the conservation program is to mitigate for those impacts to PMJM habitat that cannot be avoided by restoring and enhancing surrounding habitats. Successful habitat restoration and enhancement is intended to sustain the viability of the existing PMJM population. Through the restoration and enhancement of upland and wetland habitat, the Applicant would both compensate for permanently impacted PMJM habitat, as well as improve and increase the biological value of the adjacent habitat for PMJM. Improving habitat along the southern tributary is intended to promote the colonization of PMJM into the mitigation areas and into suitable habitats located upstream.

5.2 AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES

5.2.1 Measures to Avoid Impacts

The original project plan included developing land within 300 feet of the Kettle Creek tributaries. The Service typically considers the area within 300 feet of drainages to be occupied PMJM habitat. However, in the project area, much of the habitat within that buffer contained low-quality habitat or lacked characteristics of suitable PMJM habitat. Therefore, SWCA and the Service conducted a site visit on November 13, 2008, to assess the limits of development relative to potential PMJM habitat. A boundary was delineated along the southern tributary to depict the interface between suitable PMJM habitat and areas heavily disturbed by grazing. The site plan was then modified so that most housing lots would avoid suitable PMJM habitat. As a result, only two lots of the proposed development would overlap 0.262 acres of suitable PMJM habitat.

5.2.2 Measures to Minimize Impacts

Human activity in the new neighborhoods has the potential to impact PMJM and its habitat. In order to minimize human disturbance of PMJM and its habitat in the project area, permanent fencing (e.g., split-rail) would be installed along the drainages to discourage people from entering PMJM habitat. Signs would be posted along the fence to indicate that the area is protected for habitat restoration and that human entry is prohibited. The existing ranch road that crosses the southern tributary would be permanently closed to traffic and the fill material within the southern drainage would be removed. Fill removal would occur to match adjacent undisturbed riparian embankments and wetland elevations. The balance of the road extending to the edge of the development boundary would be reclaimed and seeded per identified prescriptions and fenced to limit public access.

Site development and construction best management practices (BMPs) would include standard state- and county-imposed practices to minimize erosion into waterways during project construction. A stormwater management plan would be developed to maintain compliance with stormwater regulations. Equipment and personnel would be made aware of PMJM issues and constraints regularly during all phases of construction. Construction equipment, materials staging, fueling, and water fill stations would buffer identified PMJM habitat to the practicable extent possible. All surface disturbances within PMJM habitat would be limited to predetermined areas within the development footprint and mitigation areas. Prior to site preparation and earthwork, all PMJM habitat adjacent to development areas would be delineated by a visual or stormwater barrier such as silt screen and avoided throughout construction.

5.2.3 Measures to Mitigate Unavoidable Impacts

To mitigate for the removal of 0.262 acre of upland PMJM habitat adjacent to the southern tributary, the Applicant would improve wetland and upland PMJM habitat within the southern tributary. In addition to compensating for direct impacts, disturbed and altered habitat on the property would be restored. Stream flow and hydrological processes have been altered and interrupted by a poorly functioning and placed culvert. This culvert has created substantial backflow and inundation of wetland habitat to the point that it is unsuitable for PMJM utilization. Current land use practices, primarily horse grazing, have disturbed downstream wetland and riparian areas, creating areas devoid of understory vegetation. The culvert removal and removal of grazing pressure on the property would address these habitat degradations.

Approximately 1.601 acres of PMJM habitat would be created or enhanced on the property as mitigation for the 0.262 acre lost (a mitigation ratio of 6:1) (Table 2). The mitigation areas are adjacent to the area of impact. Three mesic upland areas (M1, M2, and M3) and three disturbed wetland areas (W1, W2, and W3) within the headwaters of the southern tributary to Kettle Creek would be enhanced through drainage improvement projects, removal of livestock grazing pressures, shrub plantings, and seeding (Figure 4). Upland PMJM habitat (U1, U2, and U3) would be enhanced through the development of upland shrublands (Photograph 2). The ranch road would be removed and seeded (U4) and a large patch of weeds would be treated for upland habitat improvements (U5). In addition to PMJM habitat

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enhancement, fill material associated with the ranch road would be removed from the tributary and drainage, allowing the creation of wetland PMJM habitat (W4).

Table 2. PMJM Mitigation Acreage.

Mitigation Area	Acres	Description
M1	0.026	Mesic upland enhancement; plant riparian shrubs
M2	0.040	Mesic upland enhancement; plant riparian shrubs
M3	0.012	Mesic upland enhancement; plant riparian shrubs
W1	0.290	Wetland enhancement; plant wetland shrubs, tree removal
W2	0.076	Wetland enhancement; plant wetland shrubs
W3	0.024	Wetland enhancement; plant wetland shrubs
W4	0.071	Wetland creation ¹ ; plant wetland shrubs and seed
U1	0.175	Upland enhancement; plant upland shrubs
U2	0.266	Upland enhancement; plant upland shrubs
U3	0.058	Upland enhancement; plant upland shrubs
U4	0.155	Road removal and seeding ²
U5	0.408	Weed control area; chemical control of noxious weeds
Total	1.601	

¹ Wetland creation on stream bottom where fill is removed

² Includes side slopes where fill is removed



Photograph 2. Upland area (U1) that would be enhanced with vegetation utilized by PMJM. View looking northeast toward W1.

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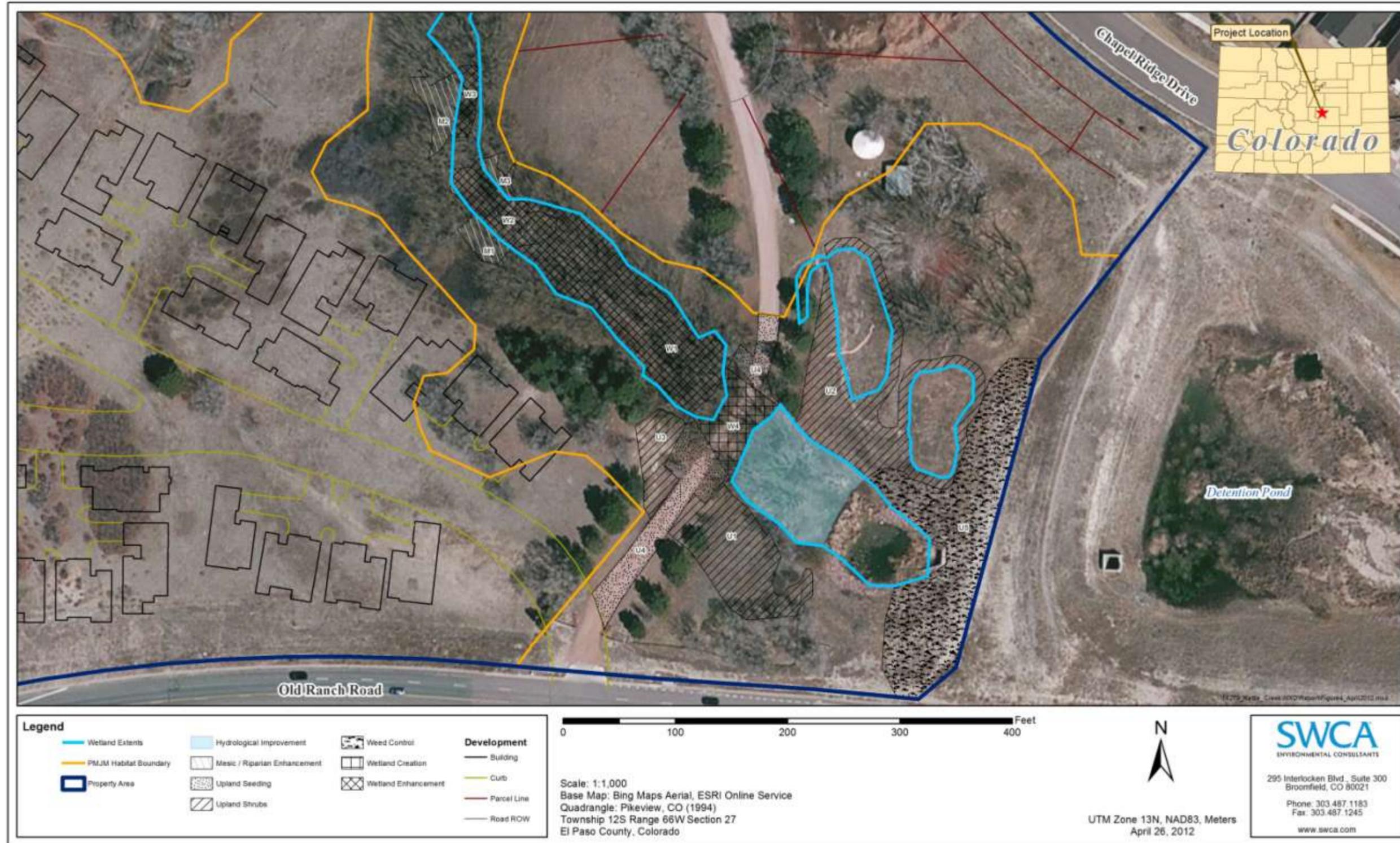


Figure 4. Conceptual design of mitigation area.

Drainage Improvements and Wetland Creation

The stream crossing and culvert under the access road leading from Old Ranch Road would be removed to improve hydrology and habitat in the Kettle Creek tributary (Photographs 3 and 4). The channel and slope embankments would be re-contoured to match adjacent undisturbed slopes and wetland elevations. The created wetland (W5) (0.071 acre) would be seeded and revegetated with herbaceous and shrub wetland species. In addition, the removal of fill would eliminate a physical and habitat barrier allowing for better PMJM movement and riparian connectivity in this area of Kettle Creek. Hydrologic conditions in the wetland area upstream of the faulty culvert would improve by allowing pooled water to flow through the stream; thus improving PMJM habitat (Photograph 5).

Fill removal would occur from the existing road, thus no direct impacts would occur to adjacent habitat. BMPs such as silt screen, straw wattles, and matting would be used to stabilize exposed slopes and prevent sedimentation of adjacent undisturbed areas. BMPs would be installed to visually delineate allowable workspace during road fill removal. BMPs would be periodically inspected and maintained as part of the project's stormwater management plan and applicable NWP authorization.



Photograph 3. A faulty culvert has caused ponding upstream of the access road.



Photograph 4. Downstream hydrology has been impacted by the faulty culvert.



Photograph 5. The ponded area upgradient of crossing is low-quality PMJM habitat that would be converted into higher quality wetland habitat.

Wetland and Riparian Enhancement

The areas of wetland enhancement (W1, W2, and W3) and mesic (riparian) enhancement (M1, M2, M3) would be planted with species that are conducive to providing high-quality habitat for PMJM (Figure 4). Mitigation areas would be enhanced through the removal of grazing pressures, upstream drainage improvements, plantings, and natural plant recruitment. Plantings would include willow cuttings, rootstock and plugs, and 1- or 5-gallon shrubs and trees, while seeding would include a wetland seed mixture (Tables 3 through 5). Planting stock would be sourced locally when possible and installed per industry standards. Typically shrub spacing would vary between 10- and 20-foot centers depending on localized topography and native species.

Currently, the overstory of these wetland and mesic mitigation areas is extremely dense, which limits the amount of adequate sunlight required for the establishment of early seral riparian shrubs and wetland graminoids required by the PMJM. Mitigation measures would include the reduction of overstory cover, primarily in W1, through the removal of several crack willow and green ash trees in these areas. Felled trees would be mulched on site to provide soil cover, which would conserve soil moisture, provide a source of organic matter, and reduce noxious weed establishment. Stumps would be spot treated through the cut stump method (cutting stumps and applying herbicides to the stump to prevent further sprouting and growth) and immediately treated with an aquatic approved herbicide such as Garlon Ultra. An approved herbicide would be non-residual in the soil and degrade quickly in the environment. The herbicide would not bio-accumulate in body tissues and be approved for aquatic or riparian use. Enough trees should remain standing in order to retain shelter, food, and cover to a host of wildlife species, including PMJM, as well as provide ample shade to create a cooler riparian microclimate.

Table 3. Wetland/Riparian Seed Mixture.

Common Name – Variety	Scientific Name	Percent	PLS (lb/ac)
Big bluestem – Bonilla/Kaw/Champ/Bison	<i>Andropogon gerardii</i>	5	1.00
American sloughgrass - Egan	<i>Beckmannia syzigachne</i>	4	0.08
Water sedge	<i>Carex aquatilis</i>	2	0.06
Nebraska sedge	<i>Carex nebrascensis</i>	2	0.08
Common spikerush	<i>Eleocharis palustris</i>	10	0.60
Canada wildrye	<i>Elymus canadensis</i>	8	1.40
Fowl mannagrass	<i>Glyceria striata</i>	5	1.00
Baltic rush	<i>Juncus balticus</i>	10	0.20
Western wheatgrass – Arriba/Rosana	<i>Pascopyrum smithii</i>	6	1.10
Switchgrass – NE28/Greenville/Blackwell	<i>Panicum virgatum</i>	10	0.80
Hardstem bulrush	<i>Scirpus acutus</i>	6	1.00
Softstem bulrush	<i>Scirpus validus</i>	6	0.40
Threesquare bulrush	<i>Scirpus pungens</i>	15	2.00
Prairie cordgrass	<i>Spartina pectinata</i>	8	1.20

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Common Name – Variety	Scientific Name	Percent	PLS (lb/ac)
Yellow Indiangrass – Cheyenne/Holt/Llano	<i>Sorghastrum nutans</i>	3	0.60
Total		100	11.52

PLS = Pure live seed

Source: Western Native Seed 2012

Table 4. Emergent Wetland Plants.

Common Name	Scientific Name	Source
Woolly sedge	<i>Carex lanuginosa</i>	Rootstock/plugs
Nebraska sedge	<i>Carex nebrascensis</i>	Rootstock/plugs
Fox sedge	<i>Carex vulpinoidea</i>	Rootstock/plugs
Creeping spikerush	<i>Eleocharis palustris</i>	Rootstock/plugs
Baltic rush	<i>Juncus balticus</i>	Rootstock/plugs
Torrey’s rush	<i>Juncus torreyi</i>	Rootstock/plugs
Arrowhead	<i>Sagittaria latifolia</i>	Rootstock/plugs
Threesquare bulrush	<i>Scirpus americanus</i>	Rootstock/plugs
Alkali bulrush	<i>Scirpus maritimus</i>	Rootstock/plugs
Softstem bulrush	<i>Scirpus validus</i>	Rootstock/plugs
Giant burreed	<i>Sparganium eurycarpum</i>	Rootstock/plugs
Hard-stem bulrush	<i>Scirpus acutus</i>	Rootstock/plugs

Table 5. Wetland and Mesic Area Native Shrubs and Trees.

Common Name*	Scientific Name	Quantity	Size
Boxelder	<i>Acer negundo</i>	20	5 gal.
Thinleaf alder	<i>Alnus incana ssp. tenuifolia</i>	20	5 gal.
Water birch	<i>Betula occidentalis</i>	5	5 gal.
Red-osier dogwood	<i>Cornus sericea</i>	5	1 qt.
Peachleaf willow	<i>Salix amygdaloides</i>	20	5 gal.
Coyote willow	<i>Salix exigua</i>	45	Bundle
Blue stem willow	<i>Salix irrorata</i>	5	1 gal.
Total		120	

***Bold** print are preferred species

Source: Rocky Mountain Native Plant Company

Upland Enhancement

To compensate for the loss of upland PMJM habitat dominated by western snowberry, three upland (U1, U2, and U3) areas would be enhanced by planting tree and shrub species listed in Table 6. Shrub corridors would be created to connect mitigation areas to existing PMJM riparian habitat downstream and upstream of the fill removal area (see Figure 4). In addition, approximately 0.408 acre upland PMJM habitat (U5) would be enhanced through the chemical control of noxious weeds (predominantly diffuse knapweed).

Following the fill removal associated with the ranch road crossing of the tributary, the rest of the ranch road extending to the edge of the development boundaries would be reclaimed and seeded using a native upland seed mixture (see Table 7). Approximately 0.155 acre of upland habitat will be created by the reclamation of the ranch road (U4).

Table 6. Upland Area Native Shrubs and Trees.

Common Name*	Scientific Name	Quantity	Size
Leadplant	<i>Amorpha canescens</i>	10	1 qt.
Prairie sagewort	<i>Artemisia frigida</i>	5	10 in ³
Ponderosa pine	<i>Pinus ponderosa</i>	5	5 gal.
American Plum	<i>Prunus americana</i>	5	1 gal.
Native chokecherry	<i>Prunus virginiana</i>	10	5 gal.
Golden current	<i>Ribes aureum</i>	20	1 qt.
Wax current	<i>Ribes cereum</i>	5	1 qt.
Wood's rose	<i>Rosa woodsii</i>	20	1 qt.
Western snowberry	<i>Symphoricarpos occidentalis</i>	30	1 gal.
Total		110	

***Bold** print are preferred species

Source: Rocky Mountain Native Plant Company

Table 7. Upland Native Seed Mixture.

Common Name – Variety	Scientific Name	Percent	PLS (lb/ac)
Indian ricegrass – Paloma/Nez Par/Rimrock	<i>Achnatherum hymenoides</i>	8	2.0
Slender wheatgrass – Pryor/San Luis	<i>Elymus trachycaulum</i>	8	1.6
Big bluestem – Bonilla/Kaw/Champ/Bison	<i>Andropogon gerardii</i>	8	1.8
Blue grama – Hachita	<i>Bouteloua gracilis</i>	8	0.6
Sideoats grama – Niner/Pierre	<i>Bouteloua curtipendula</i>	10	1.8
Prairie sandreed – Goshen/Pronghorn	<i>Calamovilfa longifolia</i>	8	1.0
Green needlegrass – Lodorm	<i>Stipa viridula</i>	8	1.6

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Common Name – Variety	Scientific Name	Percent	PLS (lb/ac)
Switchgrass – NE28/Greenville/Blackwell	<i>Panicum virgatum</i>	15	1.2
Western wheatgrass – Arriba/Rosana	<i>Pascopyrum smithii</i>	11	3.7
Little bluestem – Pastura	<i>Schizachyrium scoparium</i>	8	1.2
Yellow Indiangrass – Cheyenne/Holt/Llano	<i>Sorghastrum nutans</i>	8	1.6
Total		100	18.1

PLS = Pure live seed

Source: Western Native Seed 2012

Noxious Weed Management

In addition to the weed control in U5, weeds would be managed throughout the mitigation area. While there are numerous ways to control weeds (e.g., physical, chemical, biological), for the purposes of this conservation plan, chemical application appears to be the most effective and efficient way of reaching the desired goal of weed density reduction. Physical removal may supplement chemical treatment. The Applicant proposes to hire a licensed weed control company to apply the appropriate herbicides as needed to target specific noxious weeds and other undesirable species. When applied at the correct and recommended mixture and during the recommend time of the year, these herbicides can target certain weeds and other non-desirable plants, leaving existing grasses intact.

A qualified biologist or a certified herbicide technician would identify specific locations and species of noxious weeds and other undesirable species in the mitigation areas. For maximum results in controlling and reducing the weeds, the mitigation area would be treated prior to construction and planting, where needed. The herbicide would be applied to areas identified as infested with noxious weeds, using a tractor or a four-wheel drive all-terrain vehicle with an attached tank. Smaller areas would be treated using hand-held and/or backpack sprayers. No matter which herbicide application method is employed, emphasis would be placed on keeping the herbicide off of and away from existing trees and shrubs as well as the existing riparian vegetation along the southern tributary of Kettle Creek. Additional pressure to reduce the weed density would come from the establishment of native grass species after the initial spraying has been completed.

Herbicide re-application during the following growing seasons would be conducted on an as-needed basis, as determined by a qualified biologist or certified herbicide technician, in an effort to achieve a noxious weed density of 5% or less of the total plant composition. Should weed control efforts create excessive bare areas devoid of vegetation in the habitat enhancement area, reseedling would be conducted to a level commensurate with the identified standards of success.

5.3 MONITORING

The Applicants will carry out all mitigation activities pursuant to proposals specified within this HCP and conditions outlined within the anticipated section 10(a)(1)(B) permit. Monitoring of

those activities will be the responsibility of the Applicants through a contractor approved by the Service. Monitoring will include vegetation surveys, photo points, and tree/shrub counts. The hydrology improvements in the drainage will also be checked during annual monitoring. Any patches of weeds will be noted for weed control maintenance.

Monitoring activities will be conducted in the summer (June – August) of each year following construction/planting of the mitigation area. All monitoring efforts will be summarized in an annual report submitted to the Service by December 31 of each calendar year until success is achieved.

5.3.1 Vegetation Transects

Vegetative sampling of the mitigation area will be conducted to assess mitigation progress and to determine maintenance needs. Permanent transect lines will be placed perpendicular to the southern tributary of Kettle Creek throughout the project mitigation sites in wetland and upland mitigation areas (Figure 4). Transects will be permanently marked and mapped using GPS for future reference. A 1-square-meter quadrat would be placed along the downstream side of each transect at 5-m intervals, with the first quadrat placed between the 4- and 5-m mark.

Within each quadrat, a list of identified plant species and percent cover of each would be documented for use in determining species composition. Native species would be categorized as desirable, while noxious weeds or other weeds would be categorized as undesirable. Initially, a baseline vegetation survey would be conducted in the mitigation areas. The vegetation data collected each year along the same transects would be compared with baseline data to determine if mitigation is successful. Vegetative structure and reproductive success should also be noted during the survey.

5.3.2 Photo Points

During the baseline survey, photo points will be established, permanently marked, and mapped using GPS for future reference. Photos will be taken from various angles to wholly represent the mitigation area. Photos will be taken each year from permanently established photo points to document the progress of habitat restoration. The photographs will be included in the annual monitoring report submitted to the Service.

5.3.3 Shrub and Tree Counts

The shrubs and trees planted in the mitigation area will be mapped using GPS points for future reference. During the annual monitoring, the shrubs and trees will be counted and noted as alive or dead. The condition of the shrubs and trees will also be noted so that maintenance measures can be applied where necessary.

5.4 PERFORMANCE AND SUCCESS CRITERIA

Prior to construction and planting of the mitigation site, a baseline survey will be conducted to record existing conditions. Monitoring of the mitigation site will be initiated following the completion of planting. Monitoring results of the annual vegetation surveys will be used to determine if the mitigation has been successful in restoring PMJM habitat. Monitoring will occur

for 3 years from completion of project activities (construction and habitat restoration) or until success criteria is achieved. Success criteria for the mitigation area include:

- At least 75% aerial cover desirable herbaceous vegetation;
- 5% or less aerial cover noxious weeds (25% or less aerial cover of undesirable species);
and
- At least 80% survival of planted shrubs and trees.

Desirable vegetation includes native wetland and upland species and should cover at least 75% of the mitigation area by the third annual monitoring event. Undesirable species and bare ground should cover less than 25% of the mitigation area, with noxious weeds comprising 5% or less. Undesirable vegetation includes noxious weeds and other weedy species (e.g., kochia, Russian thistle [*Salsola kali*], and prickly lettuce [*Lactuca serriola*]). Cattail will also be considered undesirable for this project because of its tendency to form dense stands and reduce diversity. Therefore, attempts to manage cattail to remain at less than 25% of the aerial cover will be conducted. Noxious weeds include those invasive plants listed on the Colorado Noxious Weed List (Colorado Department of Agriculture 2006).

The mitigation area will be deemed successful when the success criteria are met without supplemental watering for two growing seasons, and with final approval from the Service. If success criteria are not met at the time of the third annual monitoring event, monitoring of the mitigation site will continue until success criteria is achieved and approved by the Service; additional measures may be taken to amend the success criteria to reflect conditions typical of the site. At that time, the Applicants will request a termination of the permit. The Service reserves the right to inspect the site to ensure the site meets success criteria for 20 years.

5.5 ADAPTIVE MANAGEMENT

It may be determined that additional seeding and/or replacing shrubs will be required to meet the success standards. The Service will be notified of any necessary remediation activities in the annual monitoring report. The Applicant will be responsible for improving the site (including planting, seeding, and weed control) until it meets the criteria for mitigation compliance. If planted shrubs and trees are not surviving because of lack of water, a temporary irrigation system may be necessary until plants become established.

The Applicant acknowledges that the level of information known about PMJM and the management strategies currently maintained by the Service is ever evolving. If future information regarding possible modifications to management of PMJM develops, the Applicant will adapt appropriate management strategies to the most current practices suggested by the Service, if those practices are deemed pertinent to the project area.

If it is apparent that proposed management techniques and implementation measures of the monitoring and mitigation program for this project are not adequate with respect to success criteria and habitat quality, the Applicant will consult with the Service to identify alternate management strategies that better serve the conservation of the PMJM.

In the event that some catastrophic act of nature and/or human render the proposed mitigation plan unattainable, the Applicant, in consultation with the Service, will implement an adaptive program to assure that mitigation for the proposed impacts is completed. In designing the adaptive program, at no time will the service require additional land compensation above and beyond that proposed in the HCP. In the case that additional measures are required, those measures will not be applicable without the consent of the Applicant.

5.6 REPORTING

All monitoring efforts will be summarized in an annual report submitted to the Service by December 31 of each calendar year until success is achieved. Annual Reports to the Service will include:

- Brief summary or list of project activities accomplished during the reporting year (e.g. this includes development/construction activities, and other covered activities);
- Project impacts (e.g. number of acres graded, number of buildings constructed, etc.);
- Description of any take that occurred for each covered species (includes cause of take, form of take, take amount, location of take and time of day, and deposition of dead or injured individuals);
- Brief description of conservation strategy implemented;
- Monitoring results (compliance, effects and effectiveness monitoring) and survey information (if applicable);
- Description of circumstances that made adaptive management necessary and how it was implemented, including a table summarizing the cumulative totals;
- Description of all adaptive management changes to this conservation plan by reporting period, including a very brief summary of the actions;
- Description of any changed or unforeseen circumstances that occurred and how they were dealt with;
- Funding expenditures, balance, and accrual; and
- Description of any minor or major amendments.

6.0 PLAN IMPLEMENTATION

The monitoring schedule presented in Table 8 would occur after mitigation activities cease. Additional site visits may be necessary to ensure that critical timing issues are addressed, such as plant stress from lack of water, weeds setting seed, etc.

Table 8. Monitoring Schedule.

Timing	Activities	Deliverables
Year 1, Spring	Establish and survey vegetation transects and survey photo points. Baseline vegetation survey.	Baseline Report
Year 1, Spring	Mitigation area construction - seed, plant shrubs and trees; GPS shrub and tree locations.	None (fieldwork)
Year 1, Summer	Summer monitoring event.	First Annual Mitigation Monitoring Report
Year 2, Summer	Summer monitoring event.	Second Annual Mitigation Monitoring Report
Year 3, Summer	Summer monitoring event.	Third Annual Mitigation Monitoring Report

7.0 FUNDING

7.1 COSTS OF HCP IMPLEMENTATION

The following costs are provided as an estimate for actions described in this plan. The Applicant should consult a contractor at the time of mitigation to obtain a more accurate cost estimate. Additional costs may be necessary for materials, site preparation, disposal, mobilization, or other additional tasks.

7.1.1 Wetland Enhancement

These estimated costs include planting and seeding the drainage with vegetation conducive to provide high-quality PMJM habitat. Included is drainage enhancement and ranch road fill removal. Other specific improvements include removal of crack willows and green ash, mulching felled trees, seeding and planting activities (Tables 3 to 5), chemical control of noxious weeds (predominantly diffuse knapweed), and associated labor and equipment costs. Estimated costs are \$7,500 not including the cutting/mulching of trees, which would require further coordination with potential contractors.

7.1.2 Upland Enhancement

These costs include development of mesic upland habitats, which would entail establishing shrub corridors to connect mitigation areas to existing PMJM riparian habitat downstream and wetland

habitat located in the detention pond. Additional seeding and planting activities would occur within the upland enhancement areas (Tables 6 and 7). Estimated costs are \$3,000, which include associated labor and equipment costs.

7.1.3 Noxious Weed Management

For successful mitigation, the conservation plan would include management of noxious weeds and undesirable plants in the mitigation area. The control plan would be designed to prevent any further spread of existing noxious weed species, such as diffuse knapweed and thistle (*Cirsium* spp.), while reducing the density of existing populations with the final goal being total eradication. Herbicide would be applied to noxious weed infested areas using hand-held and/or backpack sprayers and extreme emphasis would be made on keeping the herbicide away from existing trees and shrubs as well as the existing riparian vegetation and open water. Estimated cost for three years of chemical control of weeds is \$6,000 (\$2,000/year average).

7.1.4 Monitoring

All mitigation areas will be monitored using vegetation transects and photo points. The estimated cost associated with monitoring is \$16,000 and assumes four site visits (baseline visit plus 3 years of monitoring) and four reports (baseline and three annual reports to the Service).

7.1.5 Fencing

Signage and appropriate fencing will be required to deter pedestrians from entering restored and enhanced wetland and riparian areas and developed mesic upland habitats. The fence would follow the edge of the northern and southern tributaries within the property, including the detention basin. The estimated cost for 6,500 linear feet of split rail fencing with signs posted approximately every 100 feet is \$10,000.

7.2 FUNDING SOURCES

All funding for mitigation actions and associated monitoring would be provided by Vintage Communities.

7.3 FUNDING MECHANISM AND MANAGEMENT

Funding would be managed through Vintage Communities. The Service, however, reserves the right to inspect the site to ensure it meets successful mitigation criteria throughout the duration of the 20-year permit.

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