

DRAFT
ENVIRONMENTAL ASSESSMENT



*Cattleman's Ditches Pipeline Project
Montrose County, Colorado*

Prepared For

**U.S. Bureau of Reclamation
Colorado River Basin Salinity Control Program
and
Cedar Canon Iron Springs Ditch & Reservoir Company**

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Cover Photograph:

Looking northeast from Highway 92 near the foot of Gould Reservoir dam toward a deeply gullied naturalized segment of the existing west lateral of Cattleman's Ditches (October 2014). This lateral is proposed to be decommissioned in place, without backfilling.

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LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|-------------|---|
| BLM | U.S. Department of the Interior Bureau of Land Management |
| BMP | Best Management Practice |
| CAA | Clean Air Act |
| CDOT | Colorado Department of Transportation |
| CDPHE | Colorado Department of Public Health & Environment |
| CFR | Code of Federal Regulations |
| COAHP | Colorado Office of Archaeology and Historic Preservation |
| Company | Cedar Canon Iron Springs Ditch & Reservoir Company |
| CPW | Colorado Department of Natural Resources Division of Parks & Wildlife |
| CWA | Clean Water Act |
| CWCB | Colorado Water Conservation Board |
| EA | Environmental Assessment |
| EPA | U.S. Environmental Protection Agency |
| ESA | U.S. Endangered Species Act |
| GMU | Game Management Unit |
| HQS | Habitat Quality Score |
| HUC | Hydrology Unit Code |
| LLC | Limited Liability Company |
| MOA | Memorandum of Agreement |
| mi | Mile |
| NAAQS | National Ambient Air Quality Standards |
| NEPA | National Environmental Policy Act |
| NPDES | National Pollutant Discharge Elimination System |
| NRCS | U.S. Department of Agriculture Natural Resources Conservation Service |
| PBO | Programmatic Biological Opinion |
| PIP | Plastic irrigation pipe |
| PM | Particulate matter |
| Reclamation | U.S. Department of the Interior Bureau of Reclamation |
| RMP | Resource Management Plan |
| SHPO | State Historic Preservation Office |
| SMPW | Selenium Management Program Workgroup |
| THV | Total Habitat Value |
| UFO | Uncompahgre Field Office |
| U.S. | United States of America |
| USACE | U.S. Army Corps of Engineers |
| USC | U.S. Code |
| USDA | U.S. Department of Agriculture |
| USFWS | U.S. Department of the Interior Fish & Wildlife Service |
| USGS | U.S. Geological Survey |
| VRM | Visual Resource Management |
| WAPA | Western Area Power Authority |

1 INTRODUCTION

This DRAFT Environmental Assessment (EA) has been prepared in compliance with the National Environmental Policy Act (NEPA) to disclose and evaluate the potential environmental effects of Cedar Canon Iron Springs Ditch & Reservoir Company's (the "Company's" or "Applicant's") proposed Cattleman's Ditches Pipeline Project (hereinafter, "Pipeline Project," "Project" or "Proposed Action"). The Proposed Action is located in northeastern Montrose County, Colorado, about 12 miles south of the Town of Crawford, in the Alkali Creek drainage (see Figures 1 and 2 following the main text of this document).

Rare Earth Science, LLC prepared this EA on behalf of the U.S. Department of the Interior Bureau of Reclamation (hereinafter "Reclamation"), which is authorized by the Colorado River Basin Salinity Control Act to provide funding assistance for the Proposed Action. Reclamation awarded a funding agreement to the Company for the Project in July 2013 (Agreement Number R13AC40008, hereinafter, "Funding Agreement").

A portion of the Proposed Action lies on lands administered by the U.S. Department of Interior Bureau of Land Management (BLM). BLM is in the process of reviewing this Draft EA and their comments and required environmental commitments will be included in the Final EA. The Company has simultaneously submitted to BLM an Application for Transportation and Utility Systems and Facilities on Federal Lands (Standard Form 299), for temporary and permanent rights-of-way on BLM lands involved in the Project. This Draft EA supplements information provided in the Application.

If after consideration of comments Reclamation determines that no further study and a Finding of No Significant Impact for the Proposed Action are warranted, this document will be finalized, and an Environmental Impact Statement would not be required before the Proposed Action could be implemented.

1.1 Background

The Colorado River and its tributaries provide municipal and industrial water to about 27 million people and irrigation water to nearly four million acres of land in the United States. The river also serves about 2.3 million people and 500,000 acres in Mexico. The threat of salinity loading in the Colorado River basin is a major concern in both the United States and Mexico. Salinity affects water quality, which in turn affects downstream users, by threatening the productivity of crops, degrading wildlife habitat, and corroding residential and municipal plumbing. An estimated 8.7 million tons of salt flow into the Colorado River annually, and by the year 2025, 1.8 million tons of salt will need to be diverted from the system in order to meet water quality standards in the basin (Reclamation 2005). Irrigated agriculture is a major contributor of salinity in the system. Irrigation increases salinity in the system both by depleting in-stream flows, and by mobilizing salts found in underlying geologic formations into the system, especially during flood irrigation practices.

In June 1974, Congress enacted the Colorado River Basin Salinity Control Act, Public Law 93-320, which directed the Secretary of the Interior to proceed with a program to enhance and protect the quality of water available in the Colorado River for use in the United States and Republic of Mexico. Public Law 104-20 of July 28, 1995, authorizes the Secretary of the Interior, acting through the Bureau of Reclamation, to implement a basinwide salinity control program. The Secretary may carry out the purposes of this legislation directly, or make grants, enter into

contracts, memoranda of agreement, commitments for grants, cooperative agreements, or advances of funds to non-federal entities under such terms and conditions as the Secretary may require.

Reclamation's Basinwide Salinity Control Program funds salinity control projects with a one-time grant that is limited to an applicant's competitive bid. Once constructed, the facilities are owned, operated, maintained, and replaced by the applicant at their own expense. The Company signed a cooperative funding agreement with Reclamation in July 2013 (Agreement Number R13AC40008). The targeted Project completion date is Spring 2016.

1.2 Purpose & Need for the Proposed Action

The Proposed Action focuses on an unlined ditch system located in the lower Gunnison River watershed of the upper Colorado River basin, in soils derived from Mancos Shale. The Mancos Shale is a Cretaceous-age saline marine deposit, which contributes salts to irrigation water.

The Proposed Action will replace the existing system of unlined irrigation ditches with a buried pipe delivery system, which will eliminate ditch seepage and reduce salinity in the Colorado River basin by an estimated 1,855 tons of salt per year. An additional beneficial effect of the Proposed Action is the potential reduction of selenium in the Colorado River basin (SMPW 2011); however, the amount of selenium reduction has not been quantified.

The Proposed Action is consistent with the Colorado River Basin Salinity Control Act and helps fulfill the goals of the Basinwide Salinity Control Program. Salinity reduction in the Colorado River basin will provide benefits for a broad spectrum of downstream water users, as explained in Section 1.1, above.

1.3 Description of Proposed Action & Alternatives

The Proposed Action is located in northeastern Montrose County, Colorado, about 12 miles south of the Town of Crawford, in the Alkali Creek drainage (Figure 1), and entails replacing a total of approximately 8.5 miles of open irrigation ditches of the Cattleman's irrigation system with a total of approximately 6.4 miles of buried irrigation pipe. A Plan of Development, conceptual maps, and construction drawings for the Proposed Action were prepared by Applegate Group, Inc. of Glenwood Springs and Denver, Colorado. The Company proposes to construct the Project between late Summer 2015 and Spring 2016.

The Proposed Action also includes construction of a proposed Habitat Replacement Site, to mitigate for habitat losses which would result from the Project. The Habitat Replacement Site is located in an unnamed tributary to Doug Creek (Figure 2), less than 1 mile northeast of the main Project (Figures 2 and 3). The Habitat Replacement Site will be constructed in an existing wet meadow and will consist of shallow emergent wetlands and riparian tree and shrub plantings.

In accordance with NEPA and the Council of Environmental Quality regulations, a No Action Alternative is presented and analyzed in this EA in order to provide a baseline for comparison to the Proposed Action. Under the No Action Alternative, Reclamation would not provide funding to the Company to pipe the Cattleman's ditches. Seepage from these structures would continue to contribute to salt and selenium loading in the Colorado River basin. Riparian and wetland habitats associated with the ditches would likely remain in place and continue to provide benefits to local wildlife.

The Proposed Action is described in more detail in Section 2.2 and Figures included with this Draft EA.

1.4 Alternatives Considered But Not Carried Forward

Several alignment alternatives were considered during the conceptual design process for the Project, but eliminated from detailed analysis in accordance with 40 CFR 1502.14 because they were determined to be technically challenging, economically prohibitive, and potentially more destructive to existing habitat than the Proposed Alternative.

Initially, the existing ditch alignments were considered as the primary route for the Proposed Action. Deviations from the existing ditch alignment were designed when the ditch alignment encountered one or more of the factors described below. Additionally, where existing ditch alignments were proposed for abandonment, those alignments with one or more of the following factors are proposed for decommissioning by breaching rather than backfilling:

- Extreme topography. Approximately 0.6 miles of the existing west lateral ditch alignment north of Gould Reservoir on BLM land (between Gould Reservoir and the first division structure) is deeply incised and has a high degree of naturalness in terms of terrain and vegetation. To bury a pipe in this alignment or to decommission this alignment by backfilling would be technically challenging, expensive, and destructive to established habitat and the viewshed along Highway 92, a Scenic Byway.
- Presence of utilities. Approximately 0.4 miles of the existing west lateral ditch alignment on BLM land north of the first division structure and the Highway 92 crossing has a low overhead powerline and/or a buried domestic waterline in its immediate vicinity. The overhead and buried obstructions posed by these utilities preclude the use of heavy equipment necessary to bury a pipe in this alignment or to decommission this alignment by backfilling.
- Significant old-growth vegetation. Dense mature pinyon-juniper woodlands and/or mature cottonwoods occupy approximately 1.5 miles of the existing west lateral ditch north of Gould Reservoir (including the same above-described segments that are deeply incised or encroached upon by utilities). Destruction of this old-growth vegetation to either bury a pipe alignment or decommission the ditch by backfilling would create habitat impact requiring significant additional habitat mitigation for the Project. The estimated habitat loss for the Project, if the approximately 1.5 miles of existing ditches proposed to be abandoned by breaching were instead backfilled, would increase by almost 29 percent (calculated according to the criteria set forth in the Basinwide Salinity Control Program's Procedures for Habitat Replacement Manual). Destruction of this vegetation and the associated ground disturbance would also affect the viewshed along Highway 92, which is a Scenic Byway.
- Excessive curvature in the existing ditch alignment. In locations where there was excessive curvature in the existing ditch alignment, efforts were made to straighten the pipeline alignment where the topography would allow.
- Existing ditch alignment using natural creek beds. The existing ditch alignments use segments of the Alkali Creek channel to convey irrigation water. The Project design avoids conveyance of irrigation water in natural drainages.

1.5 Location & Environmental Setting of the Proposed Action Area

The Proposed Action Area lies in the Alkali Creek and Muddy Creek hydrologic units of the Smith Fork of the Gunnison River watershed, about 150 miles southwest of Denver and about 12 miles south of the Town of Crawford, in northeast Montrose County, Colorado (see Figures 1 through 3). The Proposed Action Area extends generally between Clear Fork Road (south of Maher) and Gould Reservoir near Colorado State Highway 92. The general physical location of the Proposed Action is Sections 5, 6, 7, and 8 in Township 50 North, Range 6 West of the 6th Principal Meridian and Sections 31 and 32 in Township 51 North, Range 6 West of the 6th Principal Meridian (Figure 2 and Figure 3). The Habitat Replacement Site is 1.5 miles east of Maher on Hart Double H Ranch in Section 32 (Figures 2 and 3). Surface ownership in the Proposed Action Area is a combination of private and BLM (Figure 2).

The Proposed Action Area is located in the Colorado Plateau physiographic region, and has a semi-arid continental climate characterized by low humidity and moderately low precipitation (averaging about 13 inches annually). The average elevation in the Proposed Action Area is about 7,200 feet above mean sea level (Figure 2). Current uses on these lands in the vicinity are livestock grazing, irrigated agriculture, rural residential, and recreational hunting.

The ditches subject to the Proposed Action are in the Alkali Creek drainage, and are privately owned irrigation conveyances charged by water diverted from Crystal Creek at a location approximately 5 direct miles southeast of the Proposed Action Area (Figure 1). A total of approximately 2,800 acres of grass pasture and hay crops are served by the ditches subject to the Proposed Action. The irrigation season is approximately 150 days long. The system also conveys stock water during the irrigation off-season. On-farm irrigation is accomplished primarily using ditches, gated pipe or sprinkler systems. Drainage from the Proposed Action Area flows back to Alkali Creek which drains eventually to Crawford Reservoir (Figure 1).

Landcover on private lands in the vicinity of the Proposed Action Area consists primarily of irrigated hay meadows and pastures, pinyon-juniper woodlands, and sagebrush or mixed montane shrublands (Figure 4). BLM lands in the Proposed Action Area are mainly in natural vegetation consisting of pinyon-juniper woodlands and sagebrush or mixed montane shrublands. An approximately 8-acre area of BLM lands in the west part of the Proposed Action Area is in irrigated pasture (Figure 4a). Irrigation practices on this area will be vacated as a result of the Proposed Action.

Within the agricultural, woodland, or upland shrub matrix, areas adjacent to ditches and downgradient areas receiving leakage from the ditches have converted to riparian and/or wetland habitats. The existing ditch alignments are vegetated mostly with coyote willow and occasional cottonwoods, but also support scattered stands of common ruderal herbaceous weeds.

On BLM lands in the west part of the Proposed Action Area, certain ditch alignments (the existing west lateral) are deeply incised, and morphologically and ecologically similar to natural watercourses in Mancos Shale badland-type drainages in the region (see the cover photograph on this document and Figure 4a for approximate locations). These areas contain mature narrowleaf cottonwoods and mesic or riparian shrubs, and are not proposed for backfilling, as explained in Section 1.4.

Alkali Creek is a seasonal or intermittent drainage in the vicinity of the Proposed Action Area. Much of the off-season intermittent flow is a stock water right owned by the Company. Three

reaches of the Alkali Creek channel (Figures 2 and 3) are also used by the existing ditch system to convey irrigation water. This practice will be discontinued as part of the Proposed Action.

The Habitat Replacement Site is located in an existing man-made wetland area created by overflow from a Cathedral Domestic Water Company storage tank. Both the tank and the Habitat Replacement Site are located on private land (Hart Double H Ranch). As required by Reclamation, the Habitat Replacement Site is on land protected by a conservation easement. The site is a former pond basin that has silted in and is occupied by cattails, pasture grasses, and arctic rush. The general location of the Habitat Replacement Site is shown on Figures 2 and 3.

1.6 Relationship to Other Projects

Other salinity control projects in progress or recently implemented in the general vicinity include the following (Figure 1a):

- C Ditch Company's C Ditch/Needle Rock Pipeline Project (3 miles north of the Town of Crawford in the Cottonwood Creek drainage)
- Clipper Irrigation Salinity Control Project (2.5 miles southeast of the Town of Hotchkiss in the Cottonwood Creek drainage)
- Grandview Canal Piping Project (just south of the Town of Hotchkiss in the Smith Fork River drainage).
- Rogers Mesa Water Distribution Association's Slack and Patterson Laterals Piping Project (about 3 miles west of the Town of Hotchkiss)
- Minnesota Canal Piping Project (near the Town of Paonia in the North Fork of the Gunnison River drainage)
- Lower Stewart Ditch Pipeline Project (near the Town of Paonia in the North Fork of the Gunnison River drainage)
- Bostwick Park Water Conservation District's Siphon Lateral Salinity Control Project (near the City of Montrose)
- Forked Tongue/Holman Ditch Company's Salinity Control Project (near the Town of Eckert in the Tongue Creek drainage)

1.7 Scoping, Coordination, & Public Review

Scoping for this Draft EA was completed by Reclamation, in consultation with the following agencies and organizations, during the planning stages of the Proposed Action to identify the potential environmental and human environment issues and concerns associated with implementation of the Proposed Action and No Action Alternative:

- U.S. Bureau of Land Management, Uncompahgre Field Office, Montrose, CO
- Colorado Office of Archaeology and Historic Preservation, Denver, CO
- Colorado Parks & Wildlife, Gunnison, CO
- U.S. Fish & Wildlife Service, Ecological Services, Grand Junction, CO

- U.S. Army Corps of Engineers, Colorado West Regulatory Branch, Grand Junction, CO
- Colorado Department of Transportation, Grand Junction, CO
- U.S. Department of Energy, Western Area Power Administration, Montrose, CO
- Southern Ute Tribe, Ute Mountain Ute Tribe, and Ute Indian Tribe (Uintah and Ouray Reservation)

Concerns raised during other similar projects (see Section 1.6, above) also helped identify potential concerns for the Proposed Action.

In compliance with NEPA, this Draft EA will be available for public comment for a 30-day period (via Reclamation's website). This Draft EA is being distributed to Company shareholders, the 34 private landowners within a 0.5-mile radius of the Proposed Action, and the organizations and agencies listed in Attachment A.

Issues determined to be of potential significance, and therefore appropriate for further impacts analysis under this EA, are discussed in Section 3. The following issues were determined to be ***insignificant or not applicable***, and are not analyzed further in this EA:

- Indian Trust Assets and Native American Religious Concerns (not applicable). Indian trust assets may include lands, minerals, hunting and fishing rights, traditional gathering grounds, and water rights. No Indian trust assets have been identified within the Project area. The American Indian Religious Freedom Act was enacted to protect and preserve Native American traditional religious rights and cultural practices. These rights include, but are not limited to, access to sacred sites, freedom to worship through ceremonial and traditional rights, and use and possession of objects considered sacred. No Native American sacred sites are known within the Proposed Action Area. Neither the No Action Alternative, nor the Proposed Action, will have an effect on Indian trust assets or Native American sacred sites. To confirm this finding, Reclamation has provided the Ute tribes with historic presence in the region with a description of the Proposed Action and a written request for comments regarding any potential effects on Indian trust assets or Native American sacred sites as a result of the Proposed Action.
- Environmental Justice & Socio-Economic Issues (not applicable). Executive Order 12898 provides that federal agencies analyze programs to assure that they do not disproportionately adversely affect minority or low income populations or Indian Tribes. The Proposed Action Area does not occur on Indian reservation lands or within disproportionately adversely affected minority or low income populations. The Proposed Action would not involve population relocation, health hazards, hazardous waste, property takings, or substantial economic impacts. Therefore, neither the No Action Alternative, nor the Proposed Action, will have an environmental justice effect.
- Jurisdictional Wetlands & Other Waters of the U.S. (not applicable). The Proposed Action would affect surface and shallow subsurface hydrology supplied to wetland and riparian areas along the Proposed Action alignment, and would require four spans of intermittent streams as well as construction of a Habitat Replacement Site in an existing jurisdictional wetland. As an irrigation maintenance project, the Proposed Action is exempt from requiring a Section 404 Permit pursuant to the Clean Water Act (33 USC 1344). The applicable U.S. Army Corps of Engineers exemptions are for 1) Farm or Stock Pond or Irrigation Ditch Construction or Maintenance, and 2) Maintenance of Existing Structures. Copies of the Section 404 Exception Summaries are provided as Attachment B. The exemptions have been verbally confirmed as applicable by the

Colorado West Regulatory Branch of the U.S. Army Corps of Engineers (USACE). Written concurrence from USACE that the Proposed Action meets the Section 404 Exemptions is currently being sought. The USACE letter will also be provided in Attachment B with the Final EA. Construction of the Habitat Replacement Site will not involve placement of fill in any jurisdictional wetlands; therefore no Section 404 permit for this activity is required.

- Wild & Scenic Rivers, Land with Wilderness Characteristics, or Wilderness Study Areas (not applicable). No Wild and Scenic Rivers, land with wilderness characteristics, or Wilderness Study Areas exist in the Proposed Action Area.

2 PROPOSED ACTION & ALTERNATIVES

As explained in Section 1.3, the alternatives evaluated in this Draft EA include a No Action Alternative and the Proposed Action. The resource analysis contained within this document, along with other pertinent information, will guide Reclamation's decision about whether or not to fund the Proposed Action for implementation. The Proposed Action is analyzed in comparison to a No Action Alternative in order to determine potential effects.

2.1 No Action Alternative

Under the No Action Alternative, Reclamation would not authorize funding to the Company to pipe the Cattleman's Ditches. Irrigation practices and seepage from these structures would continue to contribute to salt and selenium loading in the Colorado River basin. Riparian and wetland habitats associated with the ditches would likely remain in place and continue to provide benefits to local wildlife.

2.2 Proposed Action Alternative

Under the Proposed Action Alternative, part of the Cattleman's Ditches system would be replaced with buried pipe. The ditches involved would be the mainline ditch beginning near Gould Reservoir, and the various Hart, Harris, Polson, and Knott laterals. The generalized locations of the involved ditches, buried pipe alignments, and other Project components are shown on Figures 2 and 3.

Table 1 (below) summarizes the Project components, with a breakdown of components on BLM land vs. private land. The Proposed Action would replace a total of approximately 44,703 lineal feet (8.5 miles) of open irrigation ditch with approximately 33,733 lineal feet (6.4 miles) of buried pipe. Approximately 6,866 feet (1.3 miles) of pipe would be installed in the existing ditch prism, and about 26,867 feet (5.1 miles) of pipe would be installed outside existing ditch alignments. Pipe diameters would range from 6 inches to 40 inches, and pipe materials would be plastic irrigation pipe (PIP). A cast-in-place intake structure would be installed on BLM land near Gould Reservoir (at the start of the Project), and various control structures would be installed throughout the Project Area, as specified by the construction drawings. Approximately 3,610 cubic yards of imported fill (bedding material) would be required for pipeline installation, including approximately 464 cubic yards on BLM lands. No pumping or compressor stations would be associated with the Proposed Action.

Table 1. Summary of Components for the Cattleman's Ditches Pipeline Project

| Component | Total Approx. Length | Approx. Length on BLM Land | Approx. Length on Private Land |
|---|----------------------|----------------------------|--------------------------------|
| Existing irrigation ditches | 44,703 ft (8.5 mi) | 12,634 ft (2.4 mi) | 32,069 ft (6.1 mi) |
| Pipe to be buried in existing ditch alignments | 6,866 ft (1.3 mi) | 2,880 ft (0.5 mi) | 3,986 ft (0.8 mi) |
| Pipe to be buried outside existing ditch alignments | 26,867 ft (5.1 mi) | 0 | 26,867 ft (5.1 mi) |
| Total amount of buried pipe to be installed | 33,733 ft (6.4 mi) | 2,880 ft (0.5 mi) | 30,853 ft (5.8 mi) |
| Abandoned ditch alignments to be decommissioned by backfilling (including culverts) | 22,091 ft (4.2 mi) | 912 ft (0.2 mi) | 21,179 ft (4.0 mi) |
| Abandoned ditch alignments to be decommissioned by breaching (not backfilling) | 15,746 ft (3.0 mi) | 8,851 ft (1.7 mi) | 6,895 ft (1.3 mi) |

Four pipeline crossings of Alkali Creek and one crossing of an Alkali Creek tributary are proposed in locations shown on Figure 4a. The north-most Alkali Creek crossing would be buried under the creek channel. Other crossings would be culverted embankment-fill spans of the creeks—essentially earthen spans supporting the pipelines over the creek at the necessary elevation. Appropriately-sized culverts would be installed through the embankment fills to allow for normal (intermittent or seasonal) creek flow. The width of the embankments would depend on the height of the span, but would generally be approximately 10 feet across the top and approximately 40 feet across the base. The culverted embankment fill method of creek spanning is necessary to maintain proper pipe elevations on the alignments. Pipe crossings buried under the creek channel would not be feasible at these locations because low points beneath the creek channel would require sediment clean-outs that would be impractical to install and maintain. Alternatively, spanning the creek channel with suspended pipe would not be feasible because the pipe would carry stock water in the winter and must be protected from freezing.

A total of approximately 37,837 feet (7.2 miles) of existing unlined irrigation ditch alignments would be abandoned as a result of the Proposed Action. Of these, about 22,091 feet (4.2 miles) would be decommissioned by backfilling and recontouring with ditch prism material, and about 15,746 feet (3 miles) would be decommissioned without backfilling. The ditches not proposed for backfilling would be breached where they are intersected by natural drainage patterns, to allow for stormwater flow. The breach locations will be shown on the construction drawings.

Five construction staging areas have been identified for the Proposed Action (Figures 2 and 3). All staging will take place on private lands in agricultural areas or on previously disturbed ground.

The Proposed Action lies partially on private lands, and partially on public lands administered by BLM (Figure 2). Currently there is no established right-of-way for the Company's ditches on BLM lands in the Proposed Action Area. The existing ditch alignments operate in prescriptive easements on both public and private lands. All private landowners in the footprint of the Proposed Action have agreed to allow the activities of the Proposed Action to be conducted on

their lands. Dedicated easements will be recorded in Montrose County when the surveyed pipe alignments and agreements are completed.

The Company is requesting temporary and permanent rights-of-way on BLM and private lands for construction, construction access, and for ongoing routine maintenance of the Proposed Action. The permanent rights-of-way would be 50 feet wide, and the temporary (construction) rights-of-way would be 20 to 30 feet wide, depending on their location and purpose. The requested rights-of-way for the Proposed Action and their specific locations will be clearly marked on the construction drawings.

All access ways for construction of the Proposed Action will be on county roads or existing private roads, except for access to the east part of the Proposed Action Area, which will be from an existing road crossing both private and BLM land (Figures 2 and 3). This road, approximately 541 feet of which is on BLM land, will require grading to allow for property drainage, safe access of vehicles, and transport of materials and equipment.

The Proposed Action would cause short-term temporary adverse effects consisting of noise, ground disturbance, and vegetation disturbance to property owners and property in the Proposed Action Area. This disturbance would occur incrementally across the Proposed Action Area during late Summer 2015 through early Spring 2016. Construction and access footprints would be limited to only those necessary to safely implement the Proposed Action. Vegetation slash would be hauled off-site to one of the several identified proposed staging areas and chipped or burned at that location. All disturbed areas would be revegetated with appropriate seed mixes and monitored subject to BLM right-of-way permit conditions and agreements between the Company and individual land owners. Best Management Practices (BMPs) would be used to control erosion, and noxious weeds would be controlled in disturbed areas according to right-of-way permit conditions and Montrose County standards (Attachment G).

The Proposed Action would also result in long-term loss of wetland and riparian habitat where ditches are proposed for abandonment or for buried pipe installation. The amount of habitat value lost would be mitigated with a Habitat Replacement Site located less than one mile northeast of the Project. The habitat evaluation and Reclamation-approved Habitat Replacement Plan are discussed in Sections 3 and 4 of this document, and included in their entirety as Attachments C and F.

Construction for the Proposed Action would take place from late Summer 2015 through early Spring 2016. Parts of the Project involving burial of pipelines outside of existing ditch alignments and implementation of the Habitat Replacement Plan could take place starting as soon as the Project receives NEPA clearance (late Summer 2015). Those parts of the Project involving burial of pipelines in existing ditch alignments must occur during the non-irrigation season (Fall of 2015 and/or Winter and early Spring of 2016). The open-cut crossings of the Project across Colorado Highway 92 must be completed prior to regional trailing of livestock, which commences on approximately October 20 in the Fall. Highway 92 at Gould Reservoir is a major regional livestock trailway without an alternate route.

3 AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES

This section discusses resources that may be affected by the Proposed Action and the No Action Alternative. During preparation of this Draft EA, information on issues and concerns was

received from the Company, resource agencies, and other interested parties, as noted in the subsections below.

For each resource, the potentially affected area and/or interests are identified, existing conditions described, and potential impacts predicted under the No Action and Proposed Action Alternatives. This section is concluded with a summary of impacts.

3.1 Water Rights & Use

The Gunnison River basin is approximately 7,800 square miles in size. Information on water rights within the Gunnison basin in general can be found in the report entitled "Gunnison River Basin Information, Colorado's Decision Support Systems" (CWCB 2004).

The Cedar Canon Iron Springs Ditch and Reservoir Company is a privately owned, non-profit, mutually-funded irrigation company incorporated and operating in Montrose County since 1883. The Company holds a 54.6 cubic foot per second (cfs) direct flow water right, appropriated in October 1883, for Crystal Creek, a Gunnison River tributary. A stock right of 5 cfs was appropriated in May 1882 and decreed in August 1936 for use during the non-irrigation season.

The Company's headgate structure on Crystal Creek is about 5 miles south-by-southeast of the Proposed Action Area, and supplies more than 16 miles of irrigation canals that flow generally north, parallel to Highway 92, to ultimate delivery points on either side of the highway between Gould Reservoir and Clear Fork Road, south of Maher. The system irrigates approximately 2,800 acres of hay crops and livestock pasture. Irrigation is primarily accomplished by flood methods directly from ditch laterals, and to a lesser extent with gated pipe and sprinklers.

No Action: The No Action Alternative would have no direct effect on water rights and uses within the Gunnison River Basin. The water delivery system would continue to function as it has in the past.

Proposed Action: Under the Proposed Action Alternative, the Company would have the ability to better manage its water rights with efficiencies gained from eliminating seepage by piping the system. Efficiencies gained may result in more water availability during the irrigation season; however, the proposed action does not include new storage or the irrigation of new lands. Stock water conveyance and distribution through the non-irrigation season would be maintained. Therefore, no direct adverse effects on water rights in the Gunnison River Basin are expected to occur due to implementation of the Proposed Action.

3.2 Water Quality

Irrigation practices in the region and in the Proposed Action Area contribute to high downstream salinity levels and create an adverse effect on the water quality of the Colorado River basin (see Section 1.1). Fish habitat in the Gunnison and Colorado Rivers is also threatened by selenium levels. Selenium is an element that occurs in the region's soils in soluble forms such as selenite, which is leached into rivers by runoff and irrigation practices. Though trace amounts of selenium are necessary for cellular functioning of many organisms, it is toxic in lightly elevated amounts. Selenium loading has not been quantified for the Proposed Action Area, but it is potentially contributing to an adverse effect on the water quality of the Colorado River basin.

The Proposed Action Area is located within the Smith Fork of the Gunnison River watershed, a major tributary of the Colorado River in west-central Colorado. The Proposed Action Area lies in two tributary watersheds of the Smith Fork River (Figure 5): the Iron Creek unit (Hydrologic Unit Code [HUC] 140200021203) and the Muddy Creek unit (HUC 14020021202). Alkali Creek (a seasonal tributary to Iron Creek) drains the majority of the Proposed Action Area. The Habitat Replacement Site is located within the Muddy Creek unit on an unnamed seasonal drainage tributary to Doug Creek. Both the Muddy Creek and Alkali Creek units (and runoff from the Company's irrigation system) ultimately drain to Crawford Reservoir. Crawford Reservoir is tributary to the Smith Fork River, and irrigation withdrawals from Crawford Reservoir are also conveyed north into the Cottonwood Creek and North Fork of the Gunnison River drainages. The water supplying the Company's irrigation system originates in the Crystal Creek unit (HUC 140200021004) to the south, and from runoff in the Iron Creek unit.

Official designated uses for the Smith Fork River and Doug Creek include coldwater aquatic habitat, recreation, water supply, and agriculture. Official designated uses for Crawford Reservoir and all Smith Fork tributaries not on the Gunnison National Forest (and not including Doug Creek) are warmwater aquatic habitat, recreation, water supply, and agriculture (CDPHE 2009, 2013). Maintenance or improvement of water quality in the Smith Fork River drainage and Crawford Reservoir would be of significant importance to users of these water resources.

Currently, none of the hydrologic units named above are on the Colorado Department of Public Health and Environment's (CDPHE's) list of impaired waters in the State of Colorado (CDPHE 2012), with the exception of Crawford Reservoir. Crawford Reservoir has dissolved oxygen (temperature) impairment within the reservoir itself, and this impairment is due to the warm season draw-down occurring on the reservoir by its many irrigation users.

No Action: Under the No Action Alternative, the estimated 1,855 tons of salt annually contributed to the Colorado River basin from this system would continue. Current selenium loading levels would continue.

Proposed Action: The Proposed Action would eliminate seepage from the ditch system, reducing salt loading to the Colorado River basin at an estimated rate of 1,855 tons per year, at a cost-effectiveness value of approximately \$50.37 per ton (as per the Funding Agreement). The Proposed Action is also expected to reduce selenium loading into the Gunnison River basin (a goal of the Gunnison Basin Selenium Management Program [SMPW 2011]); however, these benefits have not been quantified. Improved water quality would likely benefit downstream aquatic species by reducing salt and selenium loading in the Smith Fork, Gunnison, and Colorado rivers. No change in water quality would occur to the Crystal Creek drainage (which is upgradient of the Proposed Action Area) as a result of the Proposed Action. In the short-term, construction activities in waterbodies have the potential to mobilize sediments. Burial of irrigation pipe in existing ditch alignments will occur during the irrigation off-season (while no water is flowing in the ditches). The culverted embankment stream crossings are taking place in seasonal or ephemeral drainages, and are expected to be constructed during late Summer, Fall, or Winter 2015, when no water is flowing in the stream channels. Water quality construction BMPs and permanent stabilization and revegetation of the culverted embankment fills, along with proper sizing of the culverts to allow for seasonal or intermittent flow through the embankments, would be environmental commitments for the Proposed Action. Exemptions from Section 404 the Clean Water Act apply to the Proposed Action and are in the process of being verified in writing by the U.S. Army

Corps of Engineers (see Attachment B); therefore no Section 401 Water Quality Certification is required for the Proposed Action.

3.3 Air Quality

The National Ambient Air Quality Standards (NAAQS) established by the U.S. Environmental Protection Agency (EPA) under the Clean Air Act (CAA) specify limits for criteria air pollutants. Criteria pollutants include carbon monoxide, particulate matter (PM 10 and PM 2.5), ozone, sulfur dioxide, lead, and nitrogen. If the levels of a criteria pollutant in an area are higher than the NAAQS, the airshed is designated as a nonattainment area. Areas that meet the NAAQS for criteria pollutants are designated as attainment areas. Montrose County is in attainment for all criteria pollutants.

No Action: There would be no effect on air quality in the Proposed Action Area from the No Action Alternative. The ditch system would continue to operate in its current configuration and dust and exhaust would occasionally be generated by vehicles and equipment conducting routine maintenance and operation.

Proposed Action: There would be no long-term impacts to air quality from the Proposed Action. Dust from construction activities would have a temporary, short-term effect on the air quality in the immediate Project area. Dust would be generated by excavation activities and the movement of construction equipment on unpaved roads. BMPs would be implemented to minimize dust, and would include measures such as watering the construction site and access roads, as appropriate. Impacts on air quality would be temporary and would cease once construction is complete. Following construction, impacts to air quality from routine maintenance and operation activities along the pipeline corridor would be similar in magnitude to those currently occurring for the existing ditch alignments. Impacts to air quality from routine maintenance include dust from occasional travel in light vehicles along the Project corridor.

3.4 Access, Transportation, & Public Safety

The major transportation resource in the Proposed Action Area is Colorado State Highway 92 (Figures 2 and 3), which runs north-south in the immediate vicinity between the Town of Crawford in Delta County and Black Mesa in Montrose County. Clear Fork Road, a Montrose County Road off Highway 92, runs east-west and bounds the north edge of the Proposed Action Area (Figure 2). A gated road (E 8080 Trail) for access to the Cathedral Peak Ranch subdivision heads east from Highway 92 near Gould Reservoir (Figure 2). Several local private roadways and driveways off Highway 92, Clear Fork Road, and E 8080 Trail exist within the vicinity. These roads provide access and mobility for residents traveling in and out of the area. The Montrose County Sheriff and the North Fork Ambulance Service and Volunteer Fire Department cover the Proposed Action Area.

Highway 92 at Gould Reservoir is a seasonal livestock trailing route, with movement of livestock north from Black Mesa to home ranches generally beginning by October 20th each Fall.

No Action: There would be no effect to public safety, transportation, or public access from the No Action Alternative.

Proposed Action: The Proposed Action Area would be accessed using existing public roads connecting directly to the Project area (namely Highway 92 and Clear Fork Road)

or to existing private roads on private lands. An existing road on BLM land in the east part of the Proposed Action Area would be used to access the Hart lateral area of the Project (Figure 2). Access to the Proposed Action Area within Cathedral Peak Ranch subdivision would be via E 8080 Trail and Deep Creek Trail (gated roads) and the Western Area Power Authority (WAPA) Curecanti-Rifle transmission corridor road. Both the Cathedral Peak Ranch subdivision homeowners association and WAPA have given permission to the Company to access and construct the Proposed Action using their facilities and/or to work in the vicinity of their facilities. A permit application has been filed with BLM for access via the existing road on BLM lands in the east part of the Proposed Action Area. As a condition of access, the subdivision homeowners association is requiring that the gate on E 8080 Trail remain closed during the day and locked during nighttime hours. A WAPA representative visited the Proposed Action Area and provided clearance for the Proposed Action, provided that all equipment and construction activities be maintained at least 20 feet from WAPA stanchion structures or transmission lines. There would be no need for construction of new access roads for the Proposed Action, as construction access would be on existing roads and within the construction right-of-way. There are no known bridges with weight restrictions that would be used by construction vehicles. Implementation of the Proposed Action may cause limited delays along roadways adjacent to the Project areas from construction vehicles entering and exiting the local roadways. Four buried pipeline crossings of Colorado Highway 92 are proposed for the Project (two open cut crossings near Gould Reservoir and two slip culvert crossings in the north part of the Proposed Action Area), through a highway right-of-way administered by the Colorado Department of Transportation (CDOT). Brief temporary closures of Highway 92 near Gould Reservoir may be required during the construction of the open cut pipe crossings (see Figure 2 for location). The timing of this closure would be sensitive to area ranchers trailing livestock through the area—livestock trailing generally begins around October 20th each fall. Permits and traffic control for construction of the Highway 92 crossings are being coordinated with the Colorado Department of Transportation (CDOT), and any road closure would be coordinated with CDOT and local law enforcement and emergency services.

3.5 Recreational & Visual Resources

No official recreation trails or other developed public access resources exist on BLM lands involved in the Proposed Action. The Proposed Action is located in Colorado Parks & Wildlife Game Management Unit (GMU) 63, and licensed game hunters may hunt on BLM lands encompassing the Proposed Action Area or on BLM lands near the Proposed Action Area during hunting seasons. The level and nature of public use of the BLM lands involved in the Proposed Action is unknown, but expected to be low, due to lack of developed public access routes directly to the Proposed Action Area.

BLM Manual 8410-1 (Visual Resource Management) defines and categorizes visual resource management classes that provide objectives for visual resources on BLM lands as projects are proposed and implemented in the landscape. These Visual Resource Management (VRM) classes are determined through an inventory process described in BLM Manual 8410-1, and are used to provide guidance to BLM and project proponents when contemplating proposed surface disturbing activities. Class I areas are protected from visible change, Class II areas allow for visible changes that do not attract attention, Class III areas allow for visible changes that attract attention but are not dominant, and Class IV areas allow for visible changes that can dominate the landscape. The Proposed Action Area does not have an assigned VRM class in the UFO's current Resource Management Plan (RMP); however, in the forthcoming RMP Revision, BLM

lands encompassing the Proposed Action Area are expected to have a VRM rating of Class III (Julie Jackson, pers. comm). The Proposed Action Area is at least partially visible from Highway 92 along the West Elks Scenic & Historic Byway.

No Action: The No Action Alternative would have no effect on recreational or visual resources on BLM lands. Recreation in the Proposed Action Area would continue as in the past, and visual resources would remain unchanged.

Proposed Action: Construction of the Proposed Action would take place between late summer 2015 and spring 2016. The Proposed Action could temporarily disrupt recreational big game hunting during construction in the Fall months (quality of experience and hunting success) on BLM lands around the Project Area, due to construction noise and activity. The Proposed Action would not result in permanent displacement of big game in the Proposed Action Area. On BLM land, construction holes or pipeline trenches left open overnight will be covered. Covers will be secured in place and strong enough to prevent livestock or wildlife from falling through. The Proposed Action will temporarily affect the visual appearance of several Project segments on BLM lands proposed for pipe burial or decommissioning by in-filling. These segments include one approximately 762-foot segment of the existing Polson lateral on BLM land in the west part of the Proposed Action Area west of Highway 92 proposed for in-filling; and one approximately 314-foot segment of the main lateral west of Highway 92 and Gould Reservoir proposed for buried pipe installation; one approximately 1,648-foot segment of the main lateral east of Highway 92 proposed for buried pipe installation; one approximately 520-foot segment of the main lateral east of Highway 92 proposed for in-filling, and one approximately 918-foot segment of the Hart lateral proposed for buried pipe installation. These areas would contain construction equipment and activity during Project implementation, and bare ground until final grading and revegetation are accomplished. Ditches elsewhere on BLM land will be decommissioned by breaching, and their natural appearance will remain intact. Overall, the level of change to the visual characteristics of the landscape in and around the Proposed Action Area during and following construction will be low to moderate, and not out of character with the surrounding landforms, or with the rural-agricultural character of the vicinity.

3.6 Livestock Grazing

The following cattle grazing allotments exist on BLM lands within the Proposed Action Area (see Figure 2): Cedar Point (#05012 / Permittee Patricia Polson); Collins (#05043 / Permittee Harris & Sons Stirrup Bar Ranch, LLC); and East Gould Reservoir (#05041 / Permittee Harris & Sons Stirrup Bar Ranch, LLC). The Cedar Point allotment encompasses about 480 acres on and north of Cedar Point and is permitted for seasonal grazing between May 16 and October 15. Approximately 1.2 miles of existing ditches are proposed to be decommissioned (primarily by breaching) in the Cedar Point allotment. The Collins allotment is an approximately 200-acre block of BLM land in the east part of the Proposed Action Area, where a short segment of pipe would be buried and an existing road would provide construction access to the Project. The East Gould allotment wraps around the north and east sides of Gould Reservoir and encompasses ditch segments proposed for decommissioning and for pipe installation. The Collins and East Gould Reservoir allotments are permitted for grazing between May 16 and June 15.

No Action: The No Action Alternative would have no effect on grazing allotments on BLM lands. Livestock grazing in the Proposed Action Area would continue as in the past.

Proposed Action: Construction would take place between late summer 2015 and spring 2016. Under the Proposed Action, temporary disturbance to lands within BLM grazing allotments would occur during construction. Grazing in the Collins and East Gould Reservoir allotments would not likely be affected by construction, because the particular construction activities taking place would not be occurring during the grazing period. Construction activities in the Cedar Point allotment would be taking place during the irrigation off-season, and may overlap with the permitting grazing period in that allotment (during the fall). No lands currently capable of being grazed will be rendered permanently incapable of being grazed as result of the Proposed Action. The Proposed Action may result in a small increase in lands capable of providing livestock grazing within the Project Area by filling and vegetating the ditch prisms. The Proposed Action would remove a source of livestock water from the grazing allotments by decommissioning the ditches. Pipeline trenches left open overnight during construction would be kept to a minimum to reduce potential entrainment of livestock. The Company and its contractors will cooperate and coordinate with grazing permittees to avoid potential conflicts with grazing operations. Both allotment permittees are also Company shareholders and beneficiaries of the Proposed Action.

3.7 Vegetative Resources / Habitat

The Proposed Action would result in the permanent loss of riparian and wetland vegetation associated with open ditches that are to be decommissioned, and with four culverted embankment-fill spans of seasonal or ephemeral drainages. Temporary, reclaimable disturbances of upland vegetation would occur along new pipeline alignments that do not follow the existing ditch embankments. These vegetation resources support or contribute to the support of aquatic wildlife, terrestrial wildlife, and migratory birds. Public Laws 98-569 and 104-20 require that the Secretary of the Interior "shall implement measures to replace incidental fish and wildlife values foregone" and develop a program that "shall provide for the mitigation of incidental fish and wildlife values that are lost."

Figures 4 and 4a show the general landcover types in the Proposed Action Area. These include irrigated agricultural (hayfields and/or pastures), Colorado Plateau pinyon pine-Utah juniper woodlands, and Intermountain basins big sagebrush shrublands or shrub-steppe. Other landcover types intersecting or existing near the ditches / planned buried pipeline alignments involved in the Proposed Action are minor amounts of Rocky Mountain Gambel oak-mixed montane shrublands and lower montane riparian woodlands and shrublands. Proposed staging areas are all on irrigated fields or existing disturbed areas (such as a gravel pit) on private land.

Within the matrix of the general landcover types (Figures 4 and 4a), the existing ditch alignments are vegetated mostly with coyote willow, cattails, and occasional mature cottonwoods, but also feature stands of common ruderal and noxious weeds (including Canada thistle, musk thistle, and Russian knapweed). Small patches of wet meadow or swale-type vegetation are supported by ditch seepage along the existing Hart lateral where it runs along a slope. The four culverted embankment fill creek crossings are proposed at deeply-incised steep and sparsely vegetated (gullied) reaches of Alkali Creek and an Alkali Creek tributary, with bottoms supporting emergent wetland type vegetation (cattails, sedges, rushes), mesic swale type vegetation (pasture grasses), or unvegetated channel. Figure 4a shows the locations of the creek crossings, which are all located on private lands.

The BLM portions of the Proposed Action Area are mainly in mature pinyon-juniper woodlands and sagebrush shrublands (Figure 4). Existing ditch alignments proposed for pipe burial are lined with coyote willow. Reaches of existing ditch to be abandoned on BLM lands in the west part of the Proposed Action Area are deeply gullied with mature riparian wooded bottoms (cottonwoods and mesic shrubs), or have old growth pinyon-juniper woodlands with overhead and buried utility conflicts (Figure 4a). These reaches are proposed to be decommissioned without backfilling. The decommissioned reaches would be breached in locations shown on the construction drawings to prevent them from conveying irrigation water in the future. An approximately 8-acre area of BLM land in the west part of the Project area, in the Cedar Point Allotment, is in irrigated pasture (Figure 4a). Irrigation of this area would cease as a result of the Proposed Action, and the area would revert to shrubland.

The landcover types described above provide habitat for an array of wildlife (described in Section 3.8).

A habitat evaluation was performed for the Proposed Action Area by Wildlife & Natural Resource Concepts & Solutions, LLC (Zeman 2015) to quantify potential wetland and riparian habitat values that would be lost in the Proposed Action Area due to Project implementation (Attachment C). The evaluation followed methodology outlined in Reclamation's May 2010 "Basinwide Salinity Control Program: Procedures for Habitat Replacement." Table 2 summarizes the results of the habitat evaluation. Study segments are mapped in Attachment C.

Table 2. Predicted Wetland & Riparian Habitat Loss from the Proposed Action

| Study Segment | Habitat Type | Segment Length (ft) | Segment Width (ft) | Acres Affected | Habitat Quality Score (HQS) | Total Habitat Value (THV) (Acres x HQS) |
|---------------|--------------|---------------------|--------------------|----------------|-----------------------------|---|
| H1 | Shrub/Tree | 3989 | 25 | 2.29 | 0.90 | 2.06 |
| H2 | Trees/Shrub | 1149 | N/A | 1.61 | 1.30 | 2.09 |
| H3A | Shrub/Tree | 213 | 20 | 0.10 | 1.10 | 0.11 |
| H3B | Shrub/Tree | 1018 | 20 | 0.47 | 1.10 | 0.52 |
| H4 | Shrub/Tree | 1115 | 20 | 0.51 | 0.80 | 0.41 |
| H5 | Shrub/Tree | 2187 | 30 | 1.51 | 1.40 | 2.11 |
| H6 | Shrub/Grass | 528 | 25 | 0.30 | 0.80 | 0.24 |
| H7 | Shrub/Tree | 5716 | 25 | 3.28 | 0.90 | 2.95 |
| H8 | Shrub/Tree | 781 | 25 | 0.45 | -0.30 | -0.13 |
| H9 | Shrub/Tree | 1575 | 25 | 0.90 | 1.00 | 0.90 |
| H10 | Shrub/Grass | 1552 | 15 | 0.53 | 0.90 | 0.48 |
| H11 | Shrub/Grass | 465 | 10 | 0.11 | 0.00 | 0.00 |
| H12 | Grass/Forbs | 2701 | 20 | 1.24 | 0.80 | 0.99 |
| H13 | Grass/shrub | 4768 | 10 | 1.09 | 0.00 | 0.00 |
| H14A | Shrub/Tree | 760 | 10 | 0.17 | 0.90 | 0.16 |
| H14B | Shrub/Tree | 1591 | 10 | 0.37 | 0.90 | 0.33 |
| H15 | Shrub/Tree | 839 | 20 | 0.39 | 0.50 | 0.19 |
| H16 | Shrub/Tree | 2059 | 20 | 0.95 | 0.50 | 0.47 |
| H17 | Trees/Shrub | 3176 | 30 | 2.19 | 0.50 | 1.09 |

| | | | | | | |
|---------------|--------------|------|-----|--------------|------|--------------|
| H18 | Shrub/Grass | 1718 | 15 | 0.59 | 0.80 | 0.47 |
| H19 | Shrub/Tree | 7120 | 20 | 3.27 | 0.00 | 0.00 |
| H20 | Grass/Shrub | 1968 | 20 | 0.90 | 0.00 | 0.00 |
| H21 | Shrub/Tree | 1925 | 20 | 0.88 | 0.00 | 0.00 |
| H22 | Grass/Shrub | 5873 | 20 | 2.70 | 0.00 | 0.00 |
| H23 | Trees/Shrub | 2297 | 30 | 1.58 | 0.00 | 0.00 |
| H24 | Shrub/Tree | 893 | 20 | 0.41 | 0.50 | 0.21 |
| H25 | Shrub/Grass | 3745 | 20 | 1.72 | 0.00 | 0.00 |
| H26 | Grass/Forbs | 447 | 20 | 0.21 | 0.00 | 0.00 |
| SA1 | Gravel Pit | N/A | N/A | 8.40 | 0.00 | 0.00 |
| SA2 | Grass/Forbs | N/A | N/A | 2.60 | 0.00 | 0.00 |
| SA3 | Grass/Forbs | N/A | N/A | 6.10 | 0.00 | 0.00 |
| SA4 | Forbs/Shrubs | N/A | N/A | 1.40 | 0.00 | 0.00 |
| SA5 | Grass/Forbs | N/A | N/A | 1.80 | 0.00 | 0.00 |
| Totals | | | | 51.01 | | 15.66 |

In accordance with the evaluation method, Total Habitat Value (THV) is calculated for each affected wetland or riparian habitat area by multiplying its acreage by its habitat quality score (HQS), which is assigned based on a series of criteria. The HQS criteria include vegetative diversity, degree of stratification, degree of nativeness, presence of noxious weeds, overall health/condition, degree of interspersion of vegetation with open water, connectivity with other habitat types, uniqueness, water supply, and degree of human alteration. The predicted total of THV units affected due to Project implementation is the sum of the THVs across the Proposed Action Area. A total of approximately 51.01 acres of wetland or riparian habitat (equating to a total wetland and riparian habitat value of 15.66 units based on Habitat Quality Scoring) were identified adjacent to or associated with the existing structures involved in the Proposed Action (Attachment C).

No Action: There would be no effect on existing vegetation or habitat from the No Action Alternative.

Proposed Action: Construction activities would temporarily disturb vegetation in the Proposed Action Area. Following surface disturbance, appropriate reclamation procedures would be followed in order to revegetate disturbed areas and control noxious weed infestations. Irrigated areas would be returned to production immediately following construction.

Implementation of the Proposed Action would result in permanent loss of wetland and riparian habitat as ditches and ditch seepage would be eliminated and would no longer provide flowing surface water or wetland hydrology to adjacent areas. Construction of culverted embankment creek crossings would impact wetland or riparian vegetation in the creek bottoms. Proposed buried pipe alignments through sagebrush shrublands and other upland vegetation communities would temporarily affect those communities until they are reseeded to appropriate grasses and forbs and eventually recolonize as shrublands or woodlands.

The total amount of riparian and wetland habitat anticipated to be permanently affected in the Proposed Action Area is estimated at 50.01 acres, with a total estimated habitat value of 15.66 units (see Attachment C). Replacement habitat to mitigate these losses is

proposed on private property on Hart Double H Ranch, less than 1 mile northeast of the Proposed Action Area (see Section 4.6 for details). The proposed habitat replacement project would create 23.32 habitat units. After mitigating the 15.66 units required for the project, the Company would have an additional 7.66 habitat units available for future projects. Construction of the Proposed Action and the Habitat Replacement Site (see Attachment F) would follow BMPs to minimize the construction footprint, protect water quality, and minimize soil erosion. Revegetation and weed control would be implemented according to BLM right-of-way permit conditions and Montrose County standards (Attachment G). The Company is in the process of consulting with the U.S. Army Corps of Engineers regarding the Proposed Action, including the creek crossings and the Habitat Replacement Site construction, and received verbal concurrence that the Proposed Action meets Clean Water Act agricultural exemption requirements (Attachment B). Written concurrence from the U.S. Army Corps of Engineers will be included in the Final EA in Attachment B.

3.8 Wildlife Resources

In the Proposed Action Area, ditches and associated seeps provide riparian and wetland habitat within a matrix of native vegetation and irrigated hay meadows (Section 3.7). Vegetation and water resources supported by the ditches, in association with adjacent irrigated land and natural upland woodlands and shrublands, provide nesting, breeding, foraging, cover, and movement corridors for an array of wildlife.

Colorado Parks & Wildlife (CPW) describes the north part of the Proposed Action Area (mostly irrigated lands) as elk severe winter range, and the south part of the Proposed Action Area (mostly native woodlands and shrublands) as winter range and a migration corridor (Figure 6). A mule deer resident population area is mapped across the majority of the Proposed Action Area, and a winter concentration area is mapped just to the east (Figure 7). CPW also describes the Proposed Action Area as winter foraging range for bald eagle, and within overall range of black bear and mountain lion (CPW 2014). The Proposed Action Area lies within historic Gunnison sage-grouse range (Figure 8), and within sage-grouse designated critical habitat (see Sections 3.9 and 3.10 for further discussion of sage-grouse and bald eagle).

Migratory birds protected under the Migratory Bird Treaty Act find nesting and/or migratory habitat in the Proposed Action Area and the immediate vicinity, potentially including Brewer's sparrow (see Section 3.10), sage thrasher, juniper titmouse, olive-sided flycatcher, and red-shafted northern flicker. One active red-tailed hawk nest and one potential alternate red-tailed hawk nest were identified in the Proposed Action Area in the locations shown on Figure 9.

No Action: Under the No Action Alternative, terrestrial wildlife habitat would remain in its current condition, and no displacement of wildlife would occur. Salinity loading of the Colorado River drainage would continue at current rates, which will continue to affect water quality within the drainage, potentially affecting the wildlife using the area.

Proposed Action: Upland wildlife habitat impacted by the Proposed Action would result in minor temporary impacts to wildlife species within the Project Area. Impacts to big game would include short-term disturbances and periodic displacement during the late summer through early spring while construction is underway. The Proposed Action would remove a source of big game drinking water from the area by decommissioning the ditches that carry non-irrigation season stock water.

Impacts to raptors and other bird species would include minor short-term disturbance and displacement during construction, with no long-term impacts after construction. Construction would occur during the period of late Summer 2015 (August/September) through early Spring 2016 (March), outside the nesting season of most species. A red-tailed hawk nest in a cottonwood on a ditch prism may be destroyed by the Proposed Action, but this would occur outside the nesting period for this species.

Impacts to small animals, especially burrowing amphibians, reptiles, and small mammals, could include direct mortality and displacement during construction activities. Small animal species may experience reduced populations in direct proportion to the amount of disturbed habitat. These species and habitats are relatively common throughout the area and the loss would be minor. During construction, pipeline trenches left open overnight would be kept to a minimum and covered to reduce potential entrainment of animals and public safety problems. Covers would be secured in place and strong enough to prevent livestock or wildlife from falling through. Where trench covers would not be practical, wildlife escape ramps would be utilized.

Bird and amphibian species dependent on wetland and riparian habitats would experience a long-term (greater than five years) loss of habitat as described in Section 3.7. The total habitat value that would be lost long-term would be mitigated through the implementation of a Reclamation-approved Habitat Replacement Plan (Attachment F). Development of replacement habitat would mitigate impacts to wildlife and comply with the requirement of the Colorado River Basin Salinity Control Act to replace fish and wildlife values foregone (see Section 4.6 for more detail). Improved water quality would likely benefit downstream aquatic species (amphibians and fish) by reducing salt and selenium loading in the North Fork, Gunnison, and Colorado rivers.

3.9 Threatened & Endangered Species

The Endangered Species Act (ESA) of 1973 protects federally listed endangered, threatened and candidate plant and animal species and their critical habitats. Table 3 summarizes the federally-listed species that may occur within or near the Proposed Action area (USFWS 2015), and explains habitat requirements and potential effects of the Proposed Action on each species. Species with potential habitat in the Proposed Action Area, or otherwise potentially affected by the Proposed Action, are discussed following Table 3. Greenback cutthroat trout is not considered further in this analysis because of the lack of suitable habitat onsite or downstream of the Proposed Action. Unless otherwise specified, all information related to the species below was obtained from resources available on USFWS' Environmental Conservation Online System (ecos.fws.gov).

Table 3. Federally-Listed Species Potentially Occurring in or Near the Proposed Action Area

| Common Name | Status | Habitat Requirement Summary | Range in Project Area? | Habitat in Project Area? |
|--|------------|---|--|--|
| BIRDS | | | | |
| Gunnison sage-grouse <i>Centrocercus minimus</i> | Threatened | Prefers large contiguous patches of sagebrush (>200 acres) with an abundant herbaceous understory, interspersed with wet swales. Documented occupied range is not within Project area, although large sagebrush patches in the Project vicinity are potential suitable habitat. | Historic range only | Potential suitable habitat / designated critical habitat |
| Mexican spotted owl <i>Strix occidentalis lucida</i> | Threatened | Generally nests in older mature conifer stands, and on walls of shady wooded canyons. Confirmed nest records in Colorado from Mesa Verde in Montezuma County and around Pikes Peak and the Wet Mountains east of the Great Divide. | Potential | Peripheral only |
| Yellow-billed cuckoo <i>Coccyzus americanus</i> | Threatened | Breeds in low elevation river corridors with fairly extensive mature cottonwood galleries; breeding birds have been detected in the North Fork River valley (currently proposed critical habitat) 10 miles northwest of the Project area almost annually since 2003. Habitat in the Project area is not suitable for nesting. | Yes | Peripheral only |
| FISHES | | | | |
| Greenback cutthroat trout <i>Oncorhynchus clarkia stomias</i> | Threatened | High elevation cold water streams and cold water lakes with adequate stream spawning habitat present during spring. No spawning habitat or perennial water exists in the Project area. The nearest known populations are in the Minnesota Creek and Terror Creek drainages near Paonia (Dare et al., 2011). | Yes | No |
| Bonytail <i>Gila elegans</i> | Endangered | Although no habitat is present within the Project area for these four species, downstream designated critical habitat on the Colorado & Gunnison Rivers is affected by consumptive use of water from and the water quality of Crystal Creek. | No, but critical habitat is downstream | No, but critical habitat is downstream |
| Colorado pikeminnow <i>Ptychocheilus lucius</i> | | | | |
| Humpback chub <i>Gila cypha</i> | | | | |
| Razorback sucker <i>Xyrauchen texanus</i> | | | | |

The Gunnison sage-grouse was listed as threatened, and critical habitat was designated in 2014. The Gunnison sage-grouse is a sagebrush obligate endemic to Colorado and Utah south of the Colorado River. Breeding grounds (leks) consist of open areas next to tall sagebrush. For nesting and rearing young, the species requires large contiguous patches of sagebrush (>200 acres) with an abundant and relatively tall herbaceous understory, interspersed with wet swales. Wintering sage-grouse feed exclusively on sagebrush leaves. Rangewide threats to Gunnison

sage-grouse include habitat fragmentation and destruction due to exurban residential and oil & gas development. In the Crawford sage-grouse population area, declines are attributed to fragmentation of habitat components, encroachment of pinyon-juniper woodlands into sagebrush, not enough grass and forbs in the sagebrush understory, and low vegetative class diversity in the area's sagebrush (1998 Gunnison Sage-Grouse Conservation Plan for the Crawford Area). The Proposed Action Area lies within a relatively large patch of sagebrush (Figure 4) within historically occupied sage-grouse range and designated critical habitat (Figure 8). No known leks (breeding grounds), nesting records, or other recent occurrence records exist in or adjacent to the Proposed Action Area. Occupied range (Figure 8) lies approximately 1.5 miles to the south and west of the Proposed Action Area, across Gould Reservoir and Iron Canyon. Gunnison sage-grouse make relatively large movements on a seasonal basis, between lek sites and wintering areas, and it is feasible that the birds could move into suitable habitat in the Proposed Action Area. However, the Proposed Action is not anticipated to occur in potentially suitable habitat for sage-grouse during the breeding (March through May) or nesting periods (April through June). Construction of the Proposed Action would affect approximately 2.7 acres of sagebrush, resulting in temporary perforation of the potentially suitable sage-grouse habitat in the Project area during late summer, fall and/or winter, until the area is reclaimed and revegetation has been completed successfully. Reclamation is in the process of consulting with USFWS regarding Gunnison sage-grouse and modification of its designated critical habitat.

The Mexican spotted owl was listed as threatened in 1993 and critical habitat was designated in 2004 (USFWS 2015). Threats to the spotted owl include removal or fragmentation of mature or old-growth forests mostly of tall mixed conifer species, but also riparian forests in some parts of its range. Also, human activity in or near nesting or roosting areas can result in the species' abandonment of the area. No designated critical habitat or suitable nesting habitat for spotted owl occurs within the Proposed Action Area (the nearest critical habitat is in documented occupied range in Mesa Verde National Park in Montezuma County). The nearest potentially suitable nesting habitat is within the Black Canyon of the Gunnison, approximately 12 miles southwest of the Proposed Action Area, although no nest records exist in the area. The species is uncommon, non-migratory, and extremely site-specific in Colorado—with known nests only in Mesa Verde National Park and in the Wet Mountains and Pike's Peak area on the Front Range. Ninety-one percent of known owls existing in the United States between 1990 and 1993 occurred on land administered by the U.S. Forest Service, and most have been found within the eleven National Forests of Arizona and New Mexico. An occurrence of a Mexican spotted owl in the Proposed Action Area would be considered an incidental dispersing individual.

The western yellow-billed cuckoo was listed as threatened in 2014. The yellow-billed cuckoo is a migratory songbird that breeds in the United States and winters in South America. The yellow-billed cuckoo has a short nesting season—incubation to fledging can take place in as little as 17 days. Cuckoos arrive on breeding and nesting grounds in Colorado in late May or early June, and depart by early August through early September. Reasons for decline of the yellow-billed cuckoo throughout the western U.S. have been attributed to destruction of its preferred riparian habitat due to agricultural conversions, flood control projects, and urbanization. In some parts of its breeding range, pesticide use may have affected the yellow-billed cuckoo's prey base—injurious pest insects such as tent caterpillars, which tend to occur in cyclic outbreaks. The preferred breeding habitat of the yellow-billed cuckoo is low elevation old-growth cottonwood forests or woodlands with dense, scrubby understories of willows or other riparian shrubs. Studies in California indicate this species may need extensive stands of riparian forest for nesting success of at least 24 acres in size. In western Colorado, the required habitat patch size might be as little as 5 acres. The nearest known nesting habitat is approximately 12 miles from the Proposed Action Area in the cottonwood forested riparian corridor of the North Fork of the

Gunnison River, where a few breeding pairs have been detected almost annually since 2003 (Jason Beason, Rocky Mountain Bird Observatory, pers. comm.). A portion of the North Fork river bottom is currently Proposed Critical Habitat for the species. Cuckoos may occur incidentally in the Proposed Action Area during foraging bouts or during migration season, but foraging or migrating habitat is not exceptional in the Proposed Action Area compared to surrounding areas. No suitable nesting habitat for this species is within the Proposed Action Area or the immediate surroundings.

The Colorado River basin has four endangered fishes: the bonytail, the Colorado pikeminnow, the humpback chub, and the razorback sucker. Decline of the four endangered fishes is due at least in part to habitat destruction (diversion and impoundment of rivers) and competition and predation from introduced fish species. In 1994, the USFWS designated critical habitat for the four endangered species at Federal Register 56(206):54957-54967, which in Colorado includes the 100-year floodplain of the upper Colorado River from Rifle to Lake Powell, and the Gunnison River from Delta to Grand Junction. None of the four endangered Colorado River fishes occur in or near the Proposed Action Area and the Proposed Action Area does not occur within or adjacent to designated critical habitat. The closest designated critical habitat and the closest potential populations of the Colorado pikeminnow, and razorback sucker are in the Gunnison River, approximately 20 miles west-by-northwest of the Proposed Action Area. The bonytail has recently been stocked in the Gunnison River and humpback chubs have been recorded.

Potential impacts to Colorado River endangered fishes would result from continued irrigation water depletion from Crystal Creek, which drains to the Gunnison River in the greater Colorado River basin. Water depletion in these basins has the potential to diminish backwater spawning areas and other habitat in downstream designated critical habitat. The estimated average historic annual amount of water diverted from the Gunnison basin tributaries due to operation of the Cattleman's Ditches irrigation system is approximately 7,576 acre-feet for irrigation of approximately 2,800 acres of grass hay ground. The resulting water depletion from the Colorado River basin is estimated at 2,363 acre-feet per year. This estimated depletion rate is equivalent to the net annual average total crop consumptive use rate calculated using the Colorado Water Conservation Board's "StateCU" consumptive use modeling software [CWCB 2012]. This average annual depletion rate is expected to remain unchanged if the Proposed Action is implemented.

No Action: In the absence of the Proposed Action, historic water depletions would continue, and salt and selenium loading from the Proposed Action Area would continue at current rates.

Proposed Action: A threatened and endangered species inventory (Rare Earth 2015) was completed in the Proposed Action Area in Fall 2014 and Spring 2015. No listed species were found or are expected in the Proposed Action Area. Suitable breeding habitat for Mexican spotted owl or western yellow-billed cuckoo does not occur within the Proposed Action Area. Temporary, reclaimable impacts to approximately 2.7 acres of potentially suitable habitat (and designated critical habitat) for sage-grouse would occur in part of the Proposed Action buried pipe alignment. The current documented range of Gunnison sage-grouse lies outside the Proposed Action Area.

Water depletions from the upper Gunnison River basin occurring as a result of ditch operations have the potential to affect downstream endangered fish habitat. No new depletions would occur as a result of the Proposed Action. Reclamation is in the process of consulting with the USFWS to enter into a Recovery Agreement incorporating the

Company's historic depletions under the umbrella of the Gunnison Basin Programmatic Biological Opinion (PBO) (USFWS 2009). Acknowledging the historic depletion under the PBO would avoid the likelihood of jeopardy and/or adverse modification of critical habitat for the endangered fishes, and ensure that the Company can continue to operate consistently with Section 7 of the Endangered Species Act. The Recovery Agreement will be included in the Final EA (Attachment D). Furthermore, the cumulative efforts of the Colorado River Basin Salinity Control Program improve water quality within designated critical habitats for the Colorado pikeminnow, razorback sucker, humpback chub, and bonytail throughout the Colorado River and Gunnison river basins by reducing salt loads. Additionally, potential reductions in selenium loading to the Gunnison basin as a result of the Proposed Action would contribute to the overall success of the Gunnison Basin Selenium Management Program (SMPW 2011).

3.10 BLM Sensitive Species

The Proposed Action is located partially on BLM lands managed by BLM's Uncompahgre Field Office (UFO). According to BLM Manual Part 6840, BLM Sensitive species (in addition to those proposed for listing under the federal ESA) are "species requiring special management consideration to promote their conservation and reduce the likelihood and need for future listing under the ESA." BLM Sensitive species are designated by the BLM's state director (BLM 2014). Of the 44 species identified as BLM Sensitive Species of the UFO (BLM 2014), 21 species were determined to occur or have the potential to occur within or near the Proposed Action Area (Table 4). These determinations were developed by reviewing published range maps and habitat requirements of each of the 44 BLM Sensitive Species of the UFO, and through informal consultation with BLM-UFO Biologist Kenneth Holsinger.

Table 4. BLM Sensitive Species in Northeast Montrose County

| Common Name | Habitat Requirement Summary | Habitat in Project Area? |
|--|--|--------------------------|
| BIRDS | | |
| American peregrine falcon <i>Falco peregrines</i> | Uses open country near cliff habitat, often near water. An active peregrine falcon nest site exists on Needle Rock on BLM's Needle Rock Area of Critical Environmental Concern (ACEC) about 10 miles north-by-northeast of the Project area. Other nests may exist in the Black Canyon of the Gunnison, 6 miles southwest. Species may forage for passerine birds in the Project area; however, more desirable foraging habitat exists closer to the nest site in the Smith Fork River corridor. | Foraging only |
| American white pelican <i>Pelecanus erythrorhynchos</i> | Inhabits large reservoirs but also observed on smaller water bodies including ponds; nests on islands. An extremely rare to uncommon migrant or seasonal resident in the UFO with no documented nesting records. Nearest local migratory stopover site is Fruitgrowers Reservoir, about 24 miles northwest of the Project area. Gould Reservoir and other reservoirs in the immediate area could offer stopover sites for rare migrants. | Migratory only |

| Common Name | Habitat Requirement Summary | Habitat in Project Area? |
|--|---|--------------------------------|
| Bald eagle <i>Haliaeetus leucocephalus</i> | Nests along forested rivers and lakes; winters in upland areas, often with rivers or lakes nearby. No records of recent nesting near the Project area. CPW maps the Project area and surrounding mesas as winter range and winter foraging range. Bald eagles likely forage across open pastures and sparse shrublands in the vicinity of the Project area during winter for rodents and carrion. | Winter foraging habitat only |
| Brewer's sparrow <i>Spizella breweri</i> | Breeds primarily in sagebrush shrublands, and less commonly in tall desert shrublands; requires relatively large shrubland patches for nesting. Migrants occur in wooded, brushy, and weedy riparian, agricultural, and urban areas, and occasionally in pinyon-juniper woodlands. | Yes |
| Ferruginous hawk <i>Buteo regalis</i> | Prefers open, rolling and/or rugged terrain in grasslands, shrubsteppe communities, or cultivated fields; nests on cliffs and rock outcrops. No nesting records in Montrose County. Wintering birds could be present around the Project area, especially open agricultural fields where burrowing rodents are present. | Winter foraging habitat only |
| Northern goshawk <i>Accipiter gentilis</i> | Nests in a variety of forest types, including deciduous, coniferous, and mixed forests including ponderosa pine, lodgepole pine, spruce-fir, and aspen. Migrants and wintering individuals occur in all coniferous forest types, including pinyon-juniper woodlands. | Winter foraging habitat only |
| White-faced ibis <i>Plegadis chihi</i> | Nests and roosts in marshes and emergent wetlands associated with lakes or reservoirs, feeds in wet hay meadows and flooded croplands (in the UFO, a fairly common spring/fall migrant, non-breeding). Could potentially use the Habitat Replacement Site or irrigated hay meadows in the region as a stopover. | Migratory only |
| FISHES | | |
| Colorado River cutthroat trout <i>Oncorhynchus clarki pleuriticus</i> | Cool, clear streams or lakes with well-vegetated stream banks for shading cover, along with deep pools, boulders, and logs; thrives at high elevations. Nearest population documented in the north Smith Fork of the Gunnison River, east of the Town of Crawford. No spawning habitat or consistent cold perennial water in the Proposed Action Area. | No |
| Bluehead sucker <i>Catostomus discobolus</i> | Large rivers and mountain streams, rarely in lakes; variable from cold clear mountain streams to warm, turbid streams; moderate to fast-flowing water above rubble-rock substrate; young prefer quiet shallow areas near shoreline. Although no habitat is present within the Project area for this species, downstream habitat on the Gunnison and Colorado Rivers is affected by consumptive use of water from Crystal Creek. | No, but habitat is down-stream |
| Flannelmouth sucker <i>Catostomus latipinnis</i> | Warm moderate- to large-sized rivers, seldom in small creeks, absent from impoundments; pools and deeper runs often near tributary mouths; also riffles and backwaters; young usually in shallower water than adults. Although no habitat is present within the Project area for this species, downstream habitat on the Gunnison and Colorado Rivers is affected by consumptive use of water from Crystal Creek. | No, but habitat is downstream |

| Common Name | Habitat Requirement Summary | Habitat in Project Area? |
|--|---|-------------------------------|
| Roundtail chub <i>Gila robusta</i> | Water- rocky runs, rapids, and pools of creeks and small to large rivers; also large reservoirs in the upper Colorado River system; generally prefers cobble-rubble, sand-cobble, or sand-gravel substrate. Although no habitat is present within the Project area for this species, downstream habitat on the Gunnison and Colorado Rivers is affected by consumptive use of water from Crystal Creek. | No, but habitat is downstream |
| MAMMALS | | |
| Big free-tailed bat <i>Nyctinomops macrotis</i> | Colorado's largest bat. Forages mostly on large moths. Roosts in crevices on cliff faces, or in buildings. No breeding records exist for Colorado; wandering individuals are expected across most of the state. Some loss of foraging habitat will occur as a result of the Proposed Action. | Foraging only |
| Fringed myotis <i>Myotis thysanodes</i> | Feeds in semi-desert shrublands, coniferous woodlands, and oakbrush; associated with caves, mines, and buildings as day and night roosts. No nursery colonies have been reported in Colorado. Individuals may forage in the area during summer months, especially near water. Some loss of foraging habitat will occur as a result of the Proposed Action. | Foraging only |
| Spotted bat <i>Euderma maculatum</i> | In Colorado, spotted bats have been observed or captured in ponderosa pine woodlands, montane forests, pinyon-juniper woodlands, semi-desert shrublands, riparian vegetation, and over open sandbars. Individuals forage alone for moths, grasshoppers, beetles, katydids, and other insects. Lactating females have been captured in Colorado, but nursery sites have not been located. Rocky cliffs and buildings are used for roosts. Some loss of foraging habitat will occur as a result of the Proposed Action. | Foraging only |
| Townsend's big-eared bat <i>Corynorhinus townsendii</i> | Feeds in semi-desert shrublands, pinyon-juniper woodlands, and open montane forests; frequently associated with caves and abandoned mines for day roosts, nursery colonies, and hibernacula, but will also use crevices on rock cliffs and abandoned buildings for summer roosting. Individuals may forage in the area during summer months, especially near water. Some loss of foraging habitat will occur as a result of the Proposed Action. | Foraging only |
| HERPTILES | | |
| Midget faded rattlesnake <i>Crotalus viridis concolor</i> | Prefers rocky outcrops for refuge and hibernacula, often near riparian, upper limit of 7,500 to 9,500 feet in elevation. The species may use the Project area incidentally. There are no documented occurrences in the Project vicinity or eastern Montrose County (Hammerson 1999). | Potentially suitable |
| Milk snake <i>Lampropeltis triangulum taylori</i> | Variable types including shrubby hillsides, canyons, open ponderosa pine stands and pinyon-juniper woodlands, river valleys and canyons, animal burrows, and abandoned mines; hibernates in rock crevices. The species may use the Project area incidentally. There are no documented occurrences in the Project vicinity or eastern Montrose County (Hammerson 1999). | Potentially suitable |

| Common Name | Habitat Requirement Summary | Habitat in Project Area? |
|---|--|---|
| Northern leopard frog <i>Rana pipiens</i> | Springs, slow-moving streams, marshes, bogs, ponds, canals, floodplains, reservoirs, lakes; in summer, commonly inhabits wet meadows and fields; may forage along water's edge or in nearby meadows or fields. Leopard frogs may breed in ditch alignments, especially those with year-round sluggish water. | Yes |
| PLANTS | | |
| Colorado (Adobe) desert parsley <i>Lomatium concinnum</i> | Adobe hills and plains on rocky soils derived from the Mancos Shale Formation; shrub communities dominated by sagebrush, shadscale, greasewood, or scrub oak; elevation 5,500 to 7,000 feet. A large population has been documented on BLM land in the UFO between Hotchkiss and Crawford in Delta County. This species was not observed in the Project area during an April 2015 survey. | Potentially suitable |
| INVERTEBRATES | | |
| Great Basin silverspot butterfly <i>Speyeria nokomis nokomis</i> | Permanent spring-fed meadows, seeps, marshes, and boggy streamside meadows associated with flowing water in arid country, often in the pinyon-juniper zone. The larval host plant, bog violet (<i>Viola nephrophylla</i>), is required in abundance. Nectar sources for adults are various composites (including thistles). No larval host plants were observed in the Project area, and no adults were observed during flight season. The nearest documented silverspot colony in the UFO area is in Unaweep Canyon in Mesa County. | Larval host plant not present or not abundant in the Project Area |

No Action: The No Action Alternative would have no effect on BLM Sensitive species or their habitats.

Proposed Action: Implementation of the Proposed Action would result in temporal disturbance (construction activities) in winter foraging in irrigated fields for ferruginous hawk and bald eagle, and in pinyon-juniper woodlands northern goshawk. These raptors are wide-ranging, opportunistic, and spatially flexible in their winter foraging patterns and are expected to avoid the Proposed Action Area during construction. Temporal disturbance (construction activities) may disrupt early breeding season peregrine falcon foraging in the vicinity; however, these birds are wide-ranging, opportunistic, and spatially flexible in their foraging patterns and can be expected to avoid the Proposed Action Area during construction. Brewer's sparrow may find nesting habitat (large sagebrush patches) in the Proposed Action Area, although the timing of nesting (April through July) is not expected to correspond with construction timing. Migrating Brewer's sparrows may be present during fall and early spring months, and can be expected to avoid the Proposed Action Area during construction activities. The American white pelican and white-faced ibis could be incidental migratory visitors to the vicinity of the Proposed Action Area, but would be expected to avoid construction disturbance. BLM Sensitive mammals with the potential to use the Proposed Action Area include fringed myotis (a bat), Townsend's big-eared bat, big free-tailed bat, and spotted bat. The bats are expected to forage in the Proposed Action Area during summer and early fall, and could be temporarily displaced by construction activities. Relatively little upland shrubs or woodlands serving as foraging habitat for bats will be lost as a result of the Proposed

Action, and riparian and wetland foraging habitat loss would be mitigated in the Habitat Replacement Site. BLM Sensitive snakes potentially occurring in the Proposed Action Area (milk snake and midget faded rattlesnake) could be affected by Project construction. Hibernating northern leopard frogs may be expected to be present during construction of the Proposed Action, and implementation of the Proposed Action will result in the loss of northern leopard frog breeding habitat. To the extent that the loss of riparian or wetland habitat will affect foraging opportunities for BLM Sensitive snakes, or breeding and overwintering habitat for the northern leopard frog, these habitat losses will be mitigated by creation of a Habitat Replacement Site near the Proposed Action Area (see Section 4.6). No Colorado desert parsley was found during a pedestrian survey on BLM lands in early April 2015, during the confirmed blooming period. The areas surveyed are shown on Figure 9.

No BLM Sensitive fishes are expected to occur in the Proposed Action Area. However, water depletions from the upper Gunnison River basin occurring as a result of ditch operations have the potential to affect downstream BLM Sensitive fish habitat. No new depletions would occur as a result of the proposed action. The reduction of salinity and selenium that is expected to occur downstream in the watershed due to the Proposed Action may provide some benefit for BLM Sensitive fish habitat in downstream waters (similar to the benefits provided to the downstream endangered fish habitat described in Section 3.9).

3.11 Cultural Resources

Cultural resources are defined as physical or other expressions of human activity or occupation. Such resources include culturally significant landscapes, prehistoric and historic archaeological sites, isolated artifacts or features, traditional cultural properties, Native American and other sacred places, and artifacts and documents of cultural and historical significance.

In Fall of 2014 and Spring of 2015, Alpine Archaeological Consultants, Inc. conducted a Class III cultural resource inventory of irrigation features and areas slated for disturbance (Prouty 2015, Drake 2015). All proposed buried pipe alignments in a 100-foot-wide corridor, proposed construction disturbance areas, access roads, proposed staging areas, and the Habitat Replacement Site were examined.

The inventory resulted in the recordation of four segments of Cattleman's Ditch (sites 5MN9867.1–4), a segment of Colorado Highway 92 (site 5MN10586.1), one historic homestead (site 5MN10587), a historic habitation site (site 5MN10588), and seven isolated finds. The ditch was determined eligible for the National Register of Historic Places (NRHP) in a prior segment recording (5MN9867.1). The other recorded segments of the Cattleman's Ditch (sites 5MN9867.2–4) are also recommended as eligible for listing in the NRHP. The remaining three sites and all seven isolated finds are recommended as not eligible. Because the Project will result in impacts to Cattleman's Ditch, Level I documentation of the ditch is recommended as appropriate mitigation. Refer to Prouty 2015 and Drake 2015 for further details.

No Action: The No Action Alternative would have no effect on cultural resources.

Proposed Action: In consultation with the Colorado State Historic Preservation Officer (Colorado SHPO), Reclamation determined that the Proposed Action would have an adverse effect on Cattleman's Ditch. A Memorandum of Agreement is being developed between Reclamation and the Colorado SHPO to mitigate the adverse effects of the

proposed action, and will be included in the Final EA in Attachment E. BLM and the Company are anticipated to participate as consulting parties. Prouty (2015) recommended that to mitigate replacement of the eligible ditch segments with a pipeline, Level I documentation be conducted to capture the historic landscape characteristics of the ditch prior to its destruction.

3.12 Agricultural Resources & Soils

It is the policy of the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) to “maintain and keep current an inventory of the prime farmland and unique farmland of the Nation...the objective of the inventory is to identify the extent and location of important rural lands needed to produce food, feed, fiber, forage, and oilseed crops” (7 CFR 657.2). NRCS identifies farmlands of national and statewide importance in the region, based on soil types and irrigation status.

The Proposed Action crosses four types of farmlands of national or statewide importance (Figure 10):

Prime Farmland if Irrigated. A total of approximately 2,600 lineal feet of the proposed buried pipe alignment cross this farmland type, along with approximately 2,000 lineal feet of an existing access road to the Proposed Action Area. The mapped soil unit is Cerro loam, 1 to 6 percent slopes (Map Unit 20). Both crossings are in irrigated hay meadows or irrigated pasture. According to USDA, Prime Farmland has the best combination of physical and chemical characteristics for producing food, feed, forage fiber and oilseed crops.

Prime Farmland if Irrigated and Drained. Approximately 1,400 lineal feet of a proposed buried pipe alignment cross this farmland type. The proposed pipe alignment crosses the Alkali Creek channel, passes through a short stretch of irrigated hay meadow, then follows a private ranch road alignment and Clear Fork Road. Approximately 4,000 lineal feet of existing private ranch road that will be used to access the Proposed Action Area also crosses through this farmland type. The mapped soil unit is Apishapa silty clay loam, 0 to 5 percent slopes (Map Unit 6). As mentioned above, USDA considers Prime Farmland to have the best combination of physical and chemical characteristics for producing food, feed, forage fiber and oilseed crops. However, none of the irrigated soils of this unit are drained within the Proposed Action Area, and therefore do not meet the definition of Prime Farmland.

Farmland of Unique Importance. A total of approximately 2,500 lineal feet of proposed buried pipe alignment, approximately 1,200 lineal feet of existing ditch alignment to be backfilled, and approximately 600 lineal feet of existing private ranch road that will be used to access the Proposed Action Area cross this farmland type. The mapped soil unit is Colona silty clay loam, 6 to 12 percent slopes (Map Unit 27). Unique farmland is land other than prime farmland that is used for the production of specific high-value food and crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. It has a special combination of soil quality, location, growing season, and moisture supply required to produce sustained high quality crops when properly managed. Of all the areas of Farmland of Unique Importance crossed by the Project, approximately 600 lineal feet of proposed buried pipe alignment crosses an irrigated hay meadow. The remainder is not in cultivated agricultural production.

Farmland of Statewide Importance. Approximately 7,200 lineal feet of the proposed buried pipe alignment and approximately 1,700 lineal feet of existing private ranch road that will be used to access the Proposed Action Area cross this farmland type. The mapped soil units are Razor

silty clay loam, 3 to 12 percent slopes (Map Unit 66) and Cerro loam, 6 to 12 percent slopes (Map Unit 21). Farmlands of statewide importance are lands that nearly meet the requirements for prime farmland and have been identified by state agencies. About 1,600 lineal feet of proposed pipeline alignment cross irrigated hay meadows in this farmland type. Approximately 1.5 acres of Farmland of Statewide Importance on BLM land in the west part of the Proposed Action Area is currently irrigated by the adjoining landowner / grazing allotment permittee. Irrigation on this land would cease on this acreage as a result of the Proposed Action, due to the reconfiguration of the delivery system in this area.

Other major mapped soil units found in the immediate Proposed Action Area (Figure 10) are Midway-Gaynor silty clay loams, 10 to 40 percent slopes (Map Unit 56), Saraton-Agua Fria complex, 20 to 50 percent slopes (Map Unit 70), Gullied land (Map Unit 44), and Torriorthents-Rock outcrop, sand or shale complex (Map Units 75 and 76). Each soil type in the Proposed Action Area has at moderate or high potential for erosion from water. All of these soil types are derived from Mancos Shale, which formed in a marine environment and now contribute salinity and selenium loading in the Colorado River basin.

No Action: The No Action Alternative would have no effect on Prime Farmlands, Unique Farmlands, or Farmlands of Statewide Importance. Farmlands in the Project area would continue to produce as in the past. Salinity loading from irrigation water contact with Mancos Shale-derived soils in the current irrigation ditch system would continue as it has in the past.

Proposed Action: Under the Proposed Action Alternative, installation of the buried pipe alignments and backfilling of certain ditches would cause temporary disturbance to agriculturally important lands, including Prime Farmland if Irrigated, Prime Farmland if Irrigated and Drained, Farmland of Unique Importance, and Farmland of Statewide Importance. Some of these lands are in irrigated agricultural production (hay meadows or pastures). No farmlands will be permanently removed from production as a result of the Proposed Action, except for approximately 8 irrigated acres on BLM land in the west part of the Proposed Action Area. Irrigation practices on this area would cease because irrigation water would no longer be distributed through the current delivery system in that area, and the area would revert to native sagebrush, mixed montane shrubland, and/or pinyon-juniper woodland.

In all proposed pipeline alignments, topsoil would be reserved prior to excavation, replaced on the ground surface following pipe installation, then reseeded with hay or pasture cultivars, or appropriate upland species in non-cultivated areas. Backfilled ditches, and culverted embankment crossings of drainages would be seeded with appropriate dryland cover species. A weed control program meeting Montrose County criteria would be implemented in all areas of surface disturbance (Attachment G).

Overall, the Proposed Action would give the Company the ability to better manage its water rights with efficiencies gained from piping the system. Efficiencies gained may result in a longer irrigation season, and potentially in increased agricultural productivity; no new land will be irrigated as a result of the proposed action. Therefore, no direct adverse effects on agriculturally significant lands are expected to occur due to implementation of the Proposed Action. Water contact with Mancos Shale derived soils would be minimized in the irrigation system as a result of the Proposed Action, which would help reduce salinity loading in the Colorado River basin. Soil erosion from

irrigation water conveyance would be significantly reduced where ditches are proposed for decommissioning or replacement with buried pipe.

3.13 Cumulative Impacts

Cumulative impacts are impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

At this time, there are no known federal, state, or local projects occurring within the Proposed Action Area. The disturbances associated with the implementation of the Proposed Action are not expected to raise cumulative negative impacts to a significant level. The Proposed Action will comply with all relevant federal, state and local permits (detailed in the Summary and Environmental Commitments Section of this document).

There are three federal programs (including the Gunnison Basin Selenium Management Program) that include the Proposed Action Area at a basin-wide scale. When the Proposed Action is analyzed with components of these basin-wide programs, the cumulative beneficial effects on water quality are significant. The first program is the Colorado River Basin Salinity Control Program, which provided the funding for implementation of the Proposed Action. Collectively, projects funded under the Program result in improved water quality with the goal of reducing salt loading in the Colorado River. The second is the Upper Colorado River Endangered Fish Recovery Program. The Recovery Program involves federal, state and private organizations and agencies in Colorado, Utah, and Wyoming. Partners of the Recovery Program are recovering four species of endangered fish in the Colorado River and its tributaries while water use and development continues to meet human needs in compliance with interstate compacts and applicable federal and state laws. The third program is the Gunnison Basin Selenium Management Program which is required as a conservation measure by the Gunnison Basin Programmatic Biological Opinion (USFWS 2009). Reclamation is working with entities in the Gunnison Basin to develop the Gunnison Basin Selenium Management Plan to reduce selenium levels in the Gunnison River at Whitewater.

3.14 Summary of Impacts

Table 5 summarizes the predicted impacts of the No Action and Proposed Action Alternatives analyzed in this EA.

Table 5. Summary of Impacts of the Cattleman's Ditches Pipeline Project

| Resource Issue | Impacts | |
|----------------------|-----------------------|---|
| | No Action Alternative | Proposed Action Alternative |
| Water Rights and Use | No Effect | No Effect or possible beneficial effect |

| Resource Issue | Impacts | |
|---|--|---|
| | No Action Alternative | Proposed Action Alternative |
| Water Quality | Salt and selenium loading from the Project area would continue to affect water quality in the Colorado River Basin | An estimated salt loading reduction of 1,855 tons per year to the Colorado River Basin will result from implementation of the Proposed Action. The Proposed Action is also expected to reduce selenium loading into the Gunnison River; however, these benefits have not been quantified. Improved water quality would likely benefit downstream aquatic species by reducing salt and selenium loading in the Smith Fork, Gunnison, and Colorado rivers. Temporary impacts to water quality may occur during construction if culverted embankment stream crossings are constructed while surface water is flowing in the drainages. |
| Air Quality | No Effect | Minor short-term effects due to dust and exhaust created by construction equipment. |
| Access, Transportation, & Public Safety | No Effect | Minor temporary disruptions to local public roadways from construction traffic entering and existing roadways. Temporary brief closures of Colorado Highway 92 to vehicles for two open cut crossings, which could affect emergency vehicle passage. Timing of open cut crossing construction would need to be sensitive to livestock trailing periods. No long-term effects. |
| Recreation Resources | No Effect | Temporary short-term disruption of recreational uses such as hunting on BLM lands in and near the Proposed Action Area may occur during construction. The level and nature of public use of the BLM lands involved in the Proposed Action is unknown, but expected to be low, due to lack of developed public access routes directly to the Proposed Action Area. |
| Visual Resources | No Effect | Short-term temporary effect during construction (i.e., presence of equipment, spoil piles), with revegetation commencing following completion of the Project. Once vegetation is successfully re-established, the appearance and character of the Project area would be similar to its appearance and character prior to construction. |
| Livestock Grazing | No Effect | Temporary effect. No lands capable of providing grazing will be permanently lost. The Proposed Action is proposed to take place on BLM land mostly outside the cattle allotment grazing timeframe. Project personnel will coordinate with the grazing permit holder(s) to avoid conflicts with grazing operations. A livestock water source will be lost on the allotments due to the Proposed Action. |

| Resource Issue | Impacts | |
|-----------------------------------|--|--|
| | No Action Alternative | Proposed Action Alternative |
| Vegetative Resources / Habitat | No Effect | Short-term impacts to vegetation where construction would occur in upland areas. Estimated long-term loss of 15.66 total habitat value units, due to elimination of seepage from the involved ditch alignments. A Habitat Replacement Plan would be implemented to mitigate for the habitat value lost because of the Proposed Action. |
| Wildlife Resources | No Effect | Short-term temporary adverse effect to local wildlife during construction. A Habitat Replacement Plan would be implemented to mitigate for the long-term loss of riparian and wetland habitat due to the Proposed Action. |
| Threatened and Endangered Species | Salt and selenium loading from the Project area would continue to affect aquatic dependent species | The Proposed Action Area lies within designated critical habitat for Gunnison sage-grouse, but not within currently occupied range. Short-term reclaimable impacts would occur to potentially suitable habitat / critical habitat for sage-grouse. Water depletions (irrigation water consumption) would continue at historic levels from the Crystal Creek drainage, and would adversely affect downstream designated critical habitat for the four Colorado River federally endangered fishes. However the Upper Colorado River Endangered Fish Recovery Program and execution of a Recovery Agreement between the Company and USFWS serve as mitigation for these impacts. The Proposed Action would improve water quality by contributing to the reduction of salt and selenium loading in the Gunnison and Colorado rivers. |
| BLM Sensitive Species | Salt and selenium loading from the Project area would continue to affect aquatic dependent species | The Proposed Action would affect breeding habitat for the BLM Sensitive northern leopard frog. It may also affect foraging habitat for BLM Sensitive snakes and bats. These habitat losses would be mitigated with Replacement Habitat. Depending on timing, the Proposed Action could affect nesting for Brewer's sparrow and other migratory bird species. The Proposed Action would improve water quality by contributing to the reduction of salt and selenium loading in the Gunnison and Colorado rivers, to the benefit of BLM Sensitive fishes downstream of the Proposed Action Area. |
| Cultural Resources | No Effect | Adverse effect to NRHP eligible site, segments of the ditch system. The adverse effect would be mitigated with a Memorandum of Agreement between Reclamation and the Colorado SHPO (in progress). |

| Resource Issue | Impacts | |
|--------------------------------|-----------------------|---|
| | No Action Alternative | Proposed Action Alternative |
| Agricultural Resources & Soils | No Effect | Short-term temporary effect during construction, with agricultural production resuming following restoration of the ground surface, and appropriate reseeding, erosion control, and weed control on disturbed soils in non-irrigated areas. |
| Cumulative Impacts | No Effect | Beneficial effects related to reduction of salt and selenium loading in the Gunnison and Colorado river basins. |

4 ENVIRONMENTAL COMMITMENTS & MITIGATION MEASURES

This section discusses the environmental commitments and related mitigation developed to protect resources and mitigate adverse impacts to a non-significant level. The cooperative agreement between Reclamation and the Company requires that the Company be responsible for "...implementing and/or complying with the environmental commitments contained in the NEPA/Endangered Species Act compliance documents to be developed by Reclamation for the project".

The following environmental commitments will be implemented as an integral part of the Proposed Action, and shall be included in the contractor bid specifications.

Note that any construction activities proposed outside of the inventoried Proposed Action Area would first require additional review by Reclamation to determine if the existing surveys and information are adequate to evaluate additional impacts outside this corridor.

Note that construction work conducted outside the planned timeframe of the Proposed Action may also require evaluation for impacts to wildlife, including threatened, endangered, BLM-sensitive, or migratory bird species.

4.1 Construction Access

All construction activities would be confined to rights-of-way negotiated between the Company and the landowners. Construction staging (for pipe and equipment) will take place in several areas, as shown on Figures 2 and 3.

Environmental commitments regarding access will be included in BLM right-of-way authorizations, CDOT authorizations, and agreements with private landowners. Such commitments will be incorporated into the Final EA.

4.2 Water Quality

The following standard BMPs and environmental commitments would be implemented to minimize erosion and protect water quality of downstream resources:

- Straw wattles, silt curtains, cofferdams, dikes, straw bales, or other suitable erosion control measures shall be used to prevent erosion from entering water bodies during construction.
- Culverted embankment fill creek crossings shall be conducted during periods when the watercourse is not flowing or flowing at low levels. If a small amount of flow is present, appropriate water control measures shall be employed, such as temporary impoundments or drain ditches, which allow for construction to proceed while minimizing potential for mobilization of silt or erosion. Culverts shall be appropriately sized to allow for normal stream flow, and bedded and stabilized to prevent erosion. Embankments shall be stabilized and appropriately vegetated.
- Concrete pours shall occur in forms and/or behind cofferdams to prevent discharge into waterways. Any wastewater from concrete-batching, vehicle wash down, and aggregate processing shall be contained and treated or removed for off-site disposal.
- Fuels, lubricants, hydraulic fluids, and other petrochemicals shall be stored and dispensed in an approved staging area.
- Equipment shall be inspected daily and immediately repaired as necessary to ensure equipment is free of petrochemical leaks.
- Construction equipment shall be parked, stored, and serviced only at an approved staging area.
- A spill response plan shall be prepared in advance of construction by the contractor for areas of work where spilled contaminants could flow into water bodies. All employees and workers, including those under separate contract, shall be briefed and made familiar with this plan.
- A spill response kit, which includes appropriate-sized spill blankets, shall be easily accessible and onsite at all times.
- Onsite supervisors and equipment operators shall be trained and knowledgeable in the use of spill containment equipment.
- Appropriate federal and Colorado authorities (including BLM) shall be immediately notified in the event of any contaminant spill.

4.3 Abandoned Irrigation Facilities & Structures

Pursuant to the Cooperative Agreement between the Company and Reclamation, the Company shall permanently dewater, remove from irrigation service, and render incapable of irrigation water delivery those open ditches abandoned as part of the Proposed Action.

The Company shall be responsible for removing all decommissioned irrigation structures (head gates, drops, etc.) by methods described in the Plan of Development and/or the construction specifications provided to the contractor.

4.4 Ground Disturbances

The following BMPs and environmental commitments would be implemented to minimize and mitigate ground disturbances:

- Ground disturbances shall be limited to only those areas necessary to safely implement the Proposed Action.
- Vegetation removal shall be confined to the smallest portion of the Proposed Action Area necessary for completion of the work.
- Construction limits shall be clearly flagged onsite to avoid unnecessary plant loss or ground disturbance.
- Prior to construction, vegetative material shall be removed by mowing or chopping, and either hauled to a proposed staging area to be burned or chipped, or chipped and mulched onsite. Stumps shall be grubbed and hauled to a proposed staging area to be burned.
- Topsoil shall be stockpiled and then redistributed after completion of construction activities.
- Straw wattles, silt curtains, cofferdams, dikes, straw bales, or other suitable erosion control measures shall be used at the edges of ground disturbance to minimize soil erosion and prevent soil erosion from entering water bodies during construction.
- Following construction, all disturbed areas shall be smoothed, shaped, contoured and reseeded to as near to their pre-project conditions as practicable.
- Seeding shall occur at appropriate times with weed-free seed mixes per Reclamation specifications and the BLM right-of-way permit conditions.
- Weed control shall be implemented by the Company or the Company's contractor in accordance with BLM right-of-way permit conditions and current Montrose County weed control standards (Attachment G).

4.5 Wildlife Resources

The following BMPs and environmental commitments would be implemented to minimize and mitigate disturbances to wildlife:

- Construction areas shall be confined to the smallest feasible area and within approved construction limits/rights-of-way to minimize disturbance to wildlife within the Proposed Action Area.
- Pipeline trenches left open overnight shall be kept to a minimum and covered to reduce potential for hazards to the public and to wildlife. Covers shall be secured in place and strong enough to prevent livestock or wildlife from falling through. Where trench covers would not be practical, wildlife escape ramps shall be utilized.

- Vegetation disturbing activities are currently not planned for implementation during the nesting season of migratory birds protected under the Migratory Bird Treaty Act. However, if the schedule for the Proposed Action shifts (Section 4.13), and vegetation disturbing activities would occur during the nesting season of migratory birds, further conservation measures may be necessary to protect these species, such as pre-construction nest surveys.

4.6 Habitat Disturbance & Loss

The Salinity Control Act requires that no net loss of wildlife values result from projects under its authorization. With the assistance of Wildlife and Natural Resource Concepts & Solutions, LLC, the Company has developed a Reclamation-approved wildlife Habitat Replacement Plan to mitigate fish and wildlife values that would be foregone as a result of the Proposed Action. The Habitat Replacement Site location is on Hart Double H Ranch, less than one mile northeast of the Proposed Action Area (Figures 2 and 3). The complete Reclamation-approved Habitat Replacement Plan is provided in Attachment F.

The Habitat Replacement Plan meets the objectives of the Colorado River Basin Salinity Control Program because it is near the Proposed Action Area and provides compensation for directly affected wildlife to the greatest extent possible, it is an in-kind replacement (replaces particular values lost), it is contiguous with other habitats with wildlife value, it can be successfully managed by the Company, and has characteristics (a water source) that will assure its viability for at least 50 years.

Habitat replacement would be implemented concurrently with or prior to the implementation of the Proposed Action. The Habitat Replacement Plan involves enhancing (improving the functions and values of) an existing approximately 14-acre wetland and mesic meadow area. Improvements would include creating shallow emergent wetlands by excavating "potholes," and planting a variety of native wetland and mesic shrubs and trees on site. Woody plantings would include species such as cottonwood, peachleaf willow, three-leaf sumac, wild rose, chokecherry, native plum, and silver buffaloberry. Woody plantings would be protected with 8-foot-tall big game fencing to exclude deer, elk, and cattle while the plantings are establishing. Wire mesh would be installed around the bases of woody plantings to protect them from small herbivores, until the plantings become established. A weed treatment program will be implemented to meet standards set by Montrose County (Attachment G) and the State of Colorado. Because excavated materials will be placed in upland locations, no Section 404 permit from the U.S. Army Corps of Engineers will be required.

The Habitat Replacement Site will provide habitat for a diversity of local wildlife, including big game, songbirds, raptors, a variety of small mammals, reptiles, and amphibians, including the BLM Sensitive northern leopard frog.

The Company will be responsible for maintaining the Habitat Replacement Site and ensuring the objectives of the Habitat Replacement Plan are met. Failure to implement concurrent habitat replacement may result in delays in obligating funding under the Cooperative Agreement.

4.7 Federally-Listed Species

The Company will enter into a recovery agreement with the USFWS to incorporate its historic depletions under the umbrella of the Gunnison Basin Biological Opinion. A copy of the fully-executed Recovery Agreement will be included in Attachment D of the Final EA.

Since the Proposed Action would take place in critical habitat of the federally-listed Gunnison sage-grouse, Reclamation is also in the process of consulting with USFWS regarding effects of the Proposed Action on the species and its critical habitat. Any environmental commitments and mitigation measures required by USFWS for the protection of Gunnison sage-grouse and its critical habitat will be incorporated into the Final EA.

No further Endangered Species Act consultation would be required for the Proposed Action, unless other listed species are encountered during construction. In the event that other listed species are encountered during construction, the Company shall stop construction activities until Reclamation has consulted with USFWS to ensure that adequate measures are in place to avoid or reduce impacts to the species.

4.8 Cultural Resources

Reclamation and the Colorado State Historic Preservation Office (SHPO) are in the process of entering into a Memorandum of Agreement (MOA) to mitigate the Proposed Action's adverse effects to cultural resources. The MOA would commit Reclamation to complete historic resource documentation of the existing ditch and structures prior to construction activities in accordance with the guidance for Level I documentation found in "Historic Resource Documentation, Standards for Level I, II and III Documentation" (COAHP 2013). The Company and BLM would participate and sign as consulting parties in the MOA.

In the event that cultural and/or paleontological resources are discovered during construction, the Company must stop construction activities until Reclamation has completed consultation with the SHPO and appropriate measures are implemented to protect or mitigate the discovered resource. The MOA must be fully executed prior to initiating construction activities for the Proposed Action.

4.9 Agricultural Resources & Soils

The following BMPs and environmental commitments would be implemented to minimize and mitigate impacts to agricultural resources and soils:

- During construction, topsoil shall be saved and then redistributed after completion of construction activities.
- Straw wattles, silt curtains, cofferdams, dikes, straw bales, or other suitable erosion control measures shall be used to minimize soil erosion and prevent soil erosion from entering water bodies during construction.
- All disturbed areas shall be smoothed, shaped, contoured and reseeded to as near their pre-project conditions as practicable.
- Lands previously in agricultural production shall be returned to agricultural production following construction, with the exception of the small currently irrigated meadow on BLM land (Figure 4a).

4.10 Recreation & Visual Resources

The following BMPs and environmental commitments would be implemented to minimize and mitigate impacts on recreation and visual resources:

- During construction, individuals may be recreating on BLM land involved with the Proposed Action. Pipeline trenches left open overnight shall be kept to a minimum and covered to reduce potential for hazards to the public and to wildlife. Covers shall be secured in place and strong enough to prevent livestock, wildlife, or the public from falling through. Where trench covers would not be practical, wildlife escape ramps shall be utilized.
- Following construction, the Proposed Action Area shall be graded and vegetated to match the surrounding landscape as much as possible. Overall, the level of change to the visual characteristics of the landscape in and around the Proposed Action Area during and following construction will be low to moderate, and not out of character with the surrounding landforms, or with the rural-agricultural character of the vicinity.

4.11 Livestock Grazing

The timing of grazing on the BLM cattle allotments would not largely coincide with construction of the Proposed Action; however, the following commitments shall be implemented to mitigate impacts to livestock grazing allotments:

- Notification to the grazing permit holder(s) shall be made if construction is to occur during a grazing period. Project personnel shall cooperate with the grazing permit holder(s) to avoid conflicts with grazing operations.
- Pipeline trenches left overnight shall be kept to a minimum to reduce potential entrapment of livestock.
- Construction holes or pipeline trenches left open overnight shall be covered. Covers shall be secured in place and strong enough to prevent livestock or wildlife from falling through. Where trench covers would not be practical, wildlife escape ramps shall be utilized.
- Access to the grazing allotments shall not be affected by the Proposed Action.
- Temporarily disturbed BLM lands shall be revegetated with a BLM-recommended seed mix containing grasses and forbs palatable for forage.

4.12 Hazardous Materials, Waste Management & Pollution Prevention

Environmental impacts from hazardous materials or waste related to the Proposed Action involve potential spills or leaks of motor fuels and lubricants. Fuel and lubricant spills have the potential to impact soil and water resources, but because of the relatively small amounts of such materials that would be used in the Proposed Action Area (i.e., a 55-gallon drum), impacts from accidental spills or leaks are expected to be minimal.

During construction, the use, storage and disposal of hazardous materials and wastes within the Proposed Action Area will be managed in accordance with all federal, state, and local

standards, including the Toxic Substances Control Act of 1976, as amended (15 USC 2601, et seq., 40 CFR Part 702-799, and 40 CFR 761.1-761.193). Any trash or solid wastes generated during the Proposed Action will be properly disposed offsite.

The following BMPs and environmental commitments would be implemented with regard to hazardous materials, waste management, and pollution prevention:

- The construction contractor shall transport, handle, and store any fuels, lubricants, or other hazardous substances involved with the Proposed Action in an appropriate manner that prevents them from contaminating soil and water resources.
- Portable secondary containment shall be provided for any fuel or lubricant containers staged on BLM land within the Proposed Action Area. Any staging of fuel or lubricants, or fueling or maintenance of vehicles or equipment, will not be conducted within 100 feet of any live water or drainage.
- A spill response plan shall be prepared for areas of work where spilled contaminants could flow into water bodies. All employees and workers, including those under separate contract, will be briefed and made familiar with this plan. The plan will be developed prior to initiation of construction.
- A spill response kit, which includes appropriate-sized spill blankets, shall be easily accessible and onsite at all times.
- Onsite supervisors and equipment operators shall be trained and knowledgeable in the use of spill containment equipment.
- All spills, regardless of size, shall be cleaned up promptly and contaminated soil shall be disposed of at an approved facility.
- Appropriate federal and Colorado authorities shall be immediately notified in the event of any contaminant spill. Any spills on BLM lands will be reported to BLM promptly. Any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, Section 102b. A copy of any report required or requested by any federal agency or state government as a result of a reportable release or spill of any toxic substances shall be furnished to BLM concurrent with the filing of the reports to the involved Federal agency or State government.

4.13 Sequence and Timing of the Proposed Action

The Proposed Action would take place between late Summer 2015 and early Spring 2016. The following provides an approximate outline of the sequence of construction, in order of priority of activities.

Vegetation-disturbing activities occurring during the nesting season of migratory birds (April through July), sagebrush-disturbing activities during the breeding season of Gunnison sage-grouse (March through May), or sagebrush-disturbing activities during the nesting season of Gunnison sage-grouse (April through June) may require further conservation measures prior to

initiation (i.e., nest surveys for migratory bird species of concern and/or confirmation of sage-grouse non-occupancy).

- Colorado Highway 92 crossings to be completed prior to livestock trailing season (prior to mid-October).
- Buried pipe alignments outside the existing ditch prism (i.e., "overland" pipe alignments), including the culverted embankment fill creek crossings, to be completed prior to March 2016.
- Buried pipe alignments in existing the existing ditch prism, to begin as soon as possible with the irrigation off season (approximately October 1), with work prioritized in the south part (higher elevation part) of the Proposed Action Area, to be completed prior to the 2016 irrigation season.
- Decommission and/or backfill abandoned canals and irrigation structures and conduct final mop-up, with work prioritized in the south part (higher elevation part) of the Proposed Action Area, to be completed prior to the 2016 irrigation season.

4.14 Permits, Licenses and Approvals Needed to Implement the Proposal

The following permits, licenses, or approvals (and their statuses) are needed to implement the Proposed Action:

- BLM Right-of-Way Permit, application in progress by the Company.
- Right-of-Way approvals from private landowners with land involved in the Proposed Action, obtained by the Company.
- Stormwater Management Plan, to be submitted to the Colorado Department of Public Health and Environment (CDPHE) by the construction contractor prior to construction disturbance.
- CWA Section 402 Storm Water Discharge Permit compliant with the National Pollutant Discharge Elimination System (NPDES), to be obtained from CDPHE by the construction contractor prior to construction disturbance (regardless of whether dewatering would take place during construction).
- CDOT Highway Right-of-Way Permit, to be obtained by the construction contractor prior to constructing the open cut pipeline crossing of Colorado Highway 92.
- Traffic control measures, to be coordinated by the construction contractor with CDOT, Montrose County Sheriff, and emergency services, prior to constructing the open cut pipeline crossing of Colorado Highway 92
- Utility clearance, obtained by the Company from Western Area Power Authority for work near the high-voltage powerline corridor in the Proposed Action Area. Work approaching WAPA structures or overhead lines closer than 15 feet is not permitted.

- Utility clearances, to be obtained by the construction contractor prior to construction activities from Delta Montrose Electric Association, Cathedral Domestic Water Company, Fruitland Domestic Water Company, and any other utility in the area.
- Montrose County Road & Bridge clearance, to be obtained by the Company / construction contractor prior to crossing Clear Fork Road with buried pipeline or installing buried pipeline in the county road corridor.
- CWA Section 401/404: Because the Proposed Action is exempted from CWA Section 404, no Clean Water Act Section 401 Water Quality Certification would be required; however, water quality BMPs (as outlined above) would be implemented to protect water resources.

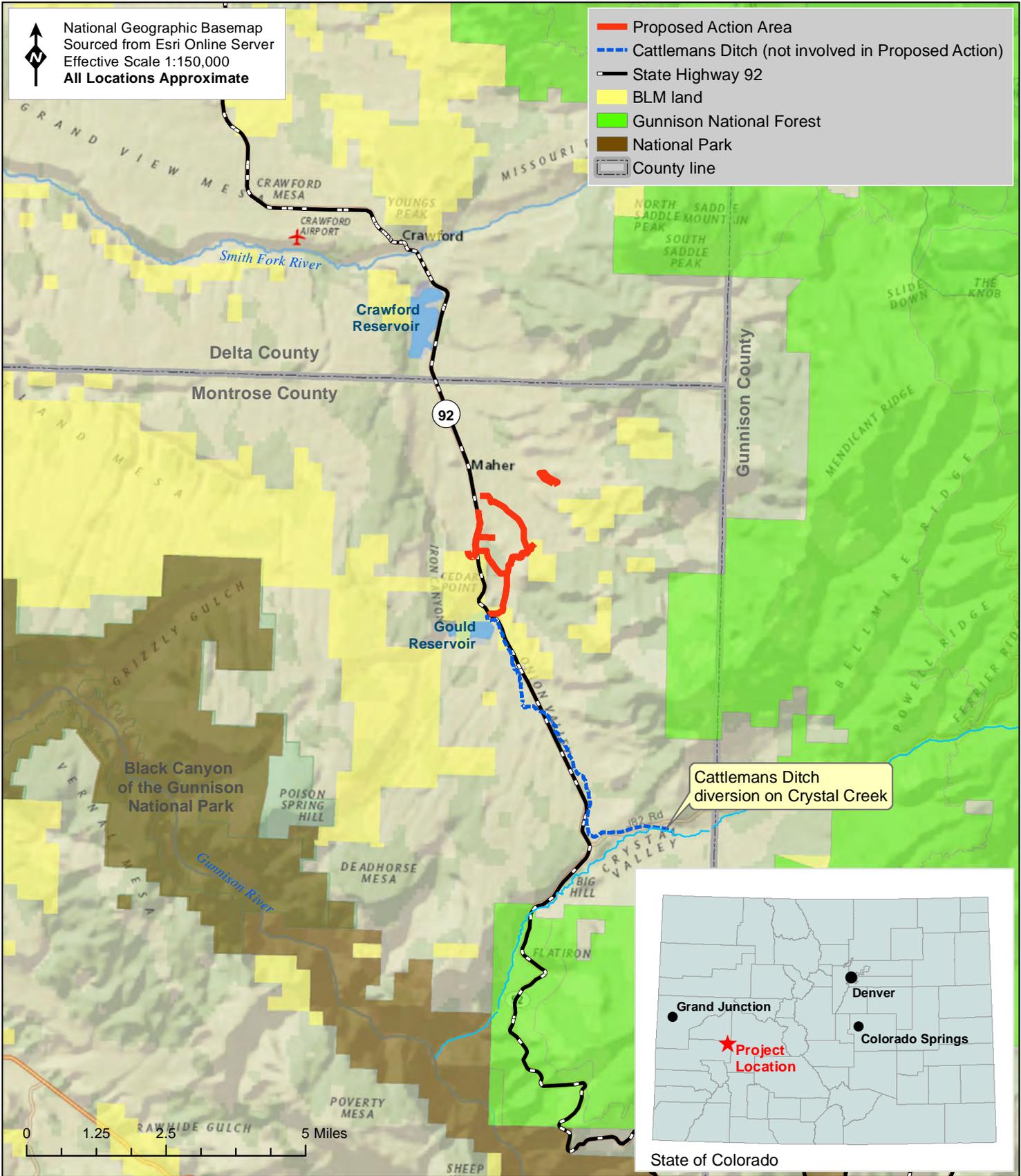
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FIGURES



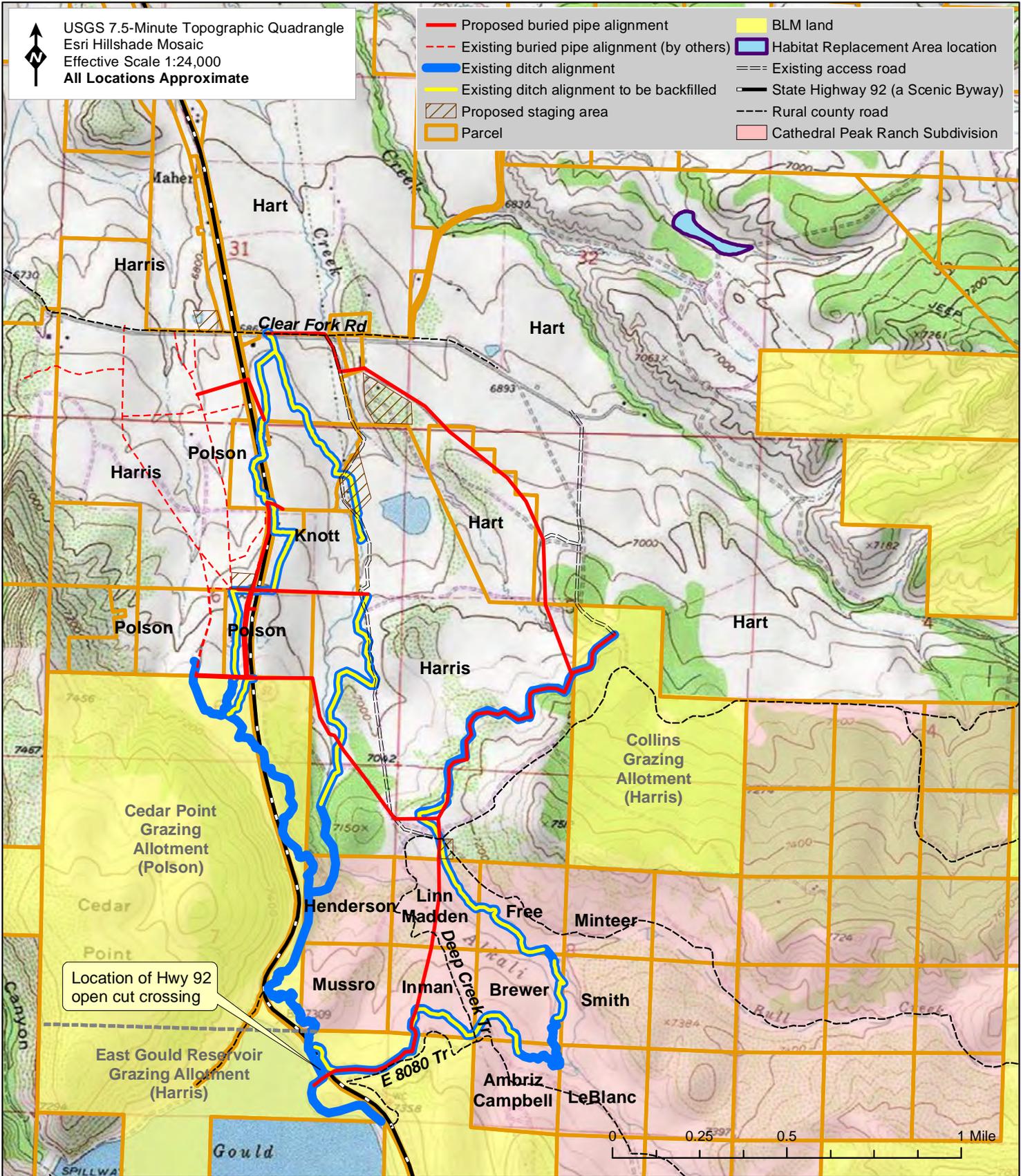
DATE: April 2015
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REGIONAL & LOCAL LOCATOR MAPS

CATTLEMAN'S DITCHES PIPELINE PROJECT ENVIRONMENTAL ASSESSMENT
 Montrose County, Colorado

FIGURE 1



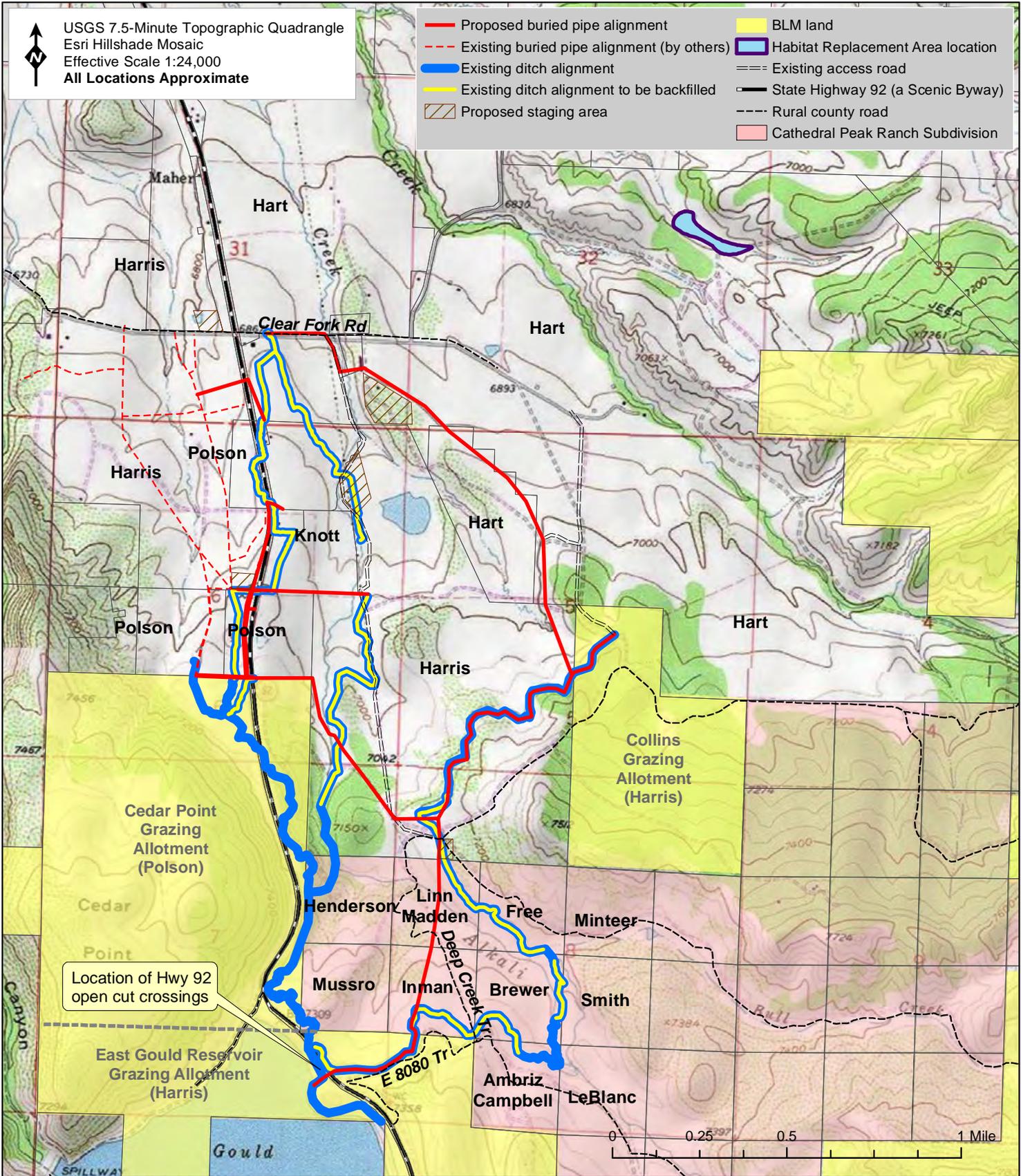
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**PROPOSED ACTION AREA
 LAND STATUS & ACCESS**

**CATTLEMAN'S DITCHES PIPELINE PROJECT
 ENVIRONMENTAL ASSESSMENT
 Montrose County, Colorado**

**FIGURE
 2**



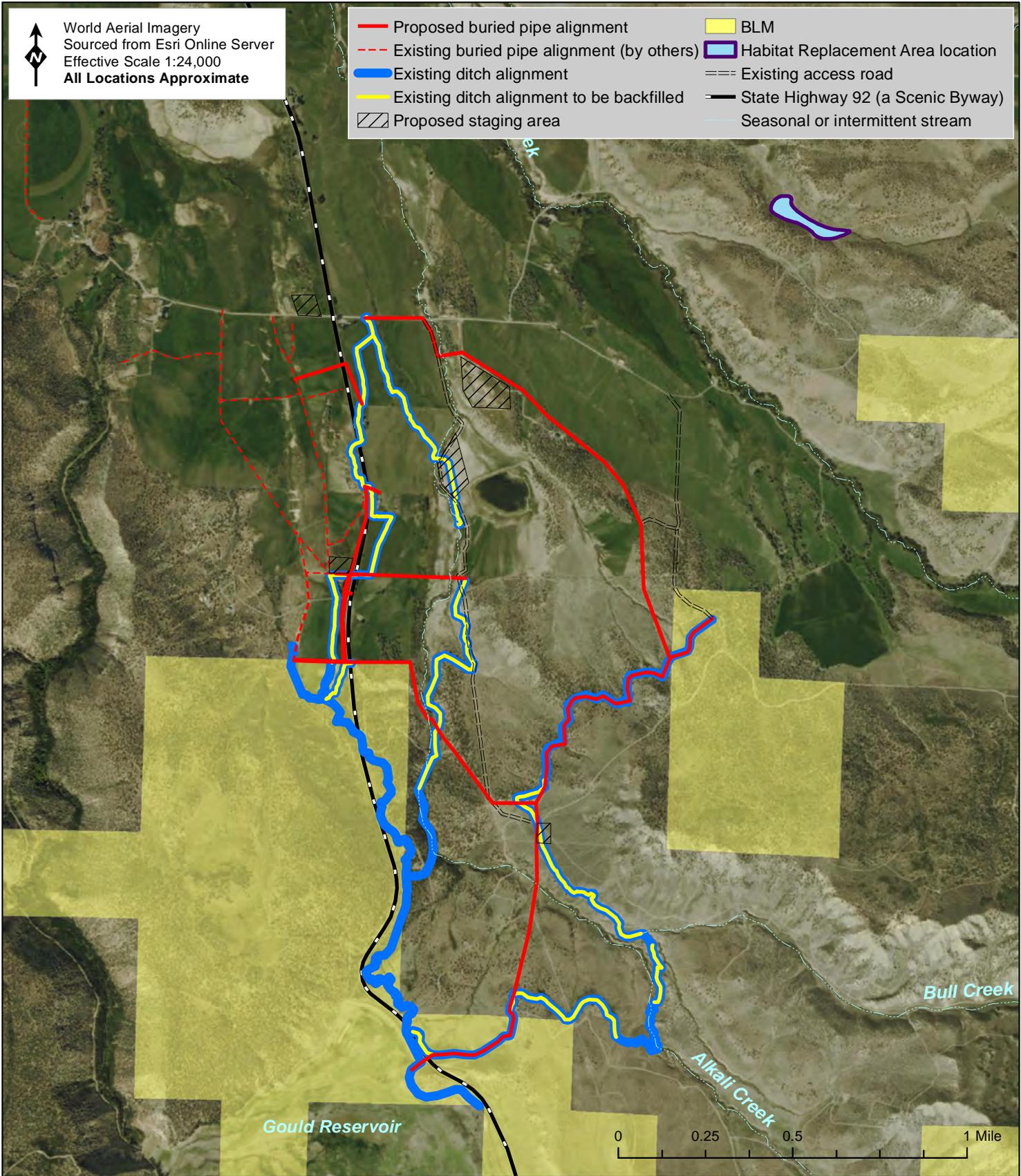
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**PROPOSED ACTION AREA
 LAND STATUS & ACCESS**

**CATTLEMAN'S DITCHES PIPELINE PROJECT
 ENVIRONMENTAL ASSESSMENT
 Montrose County, Colorado**

**FIGURE
 2**



DATE: April 2015

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**PROPOSED ACTION AREA
AERIAL OVERVIEW MAP**

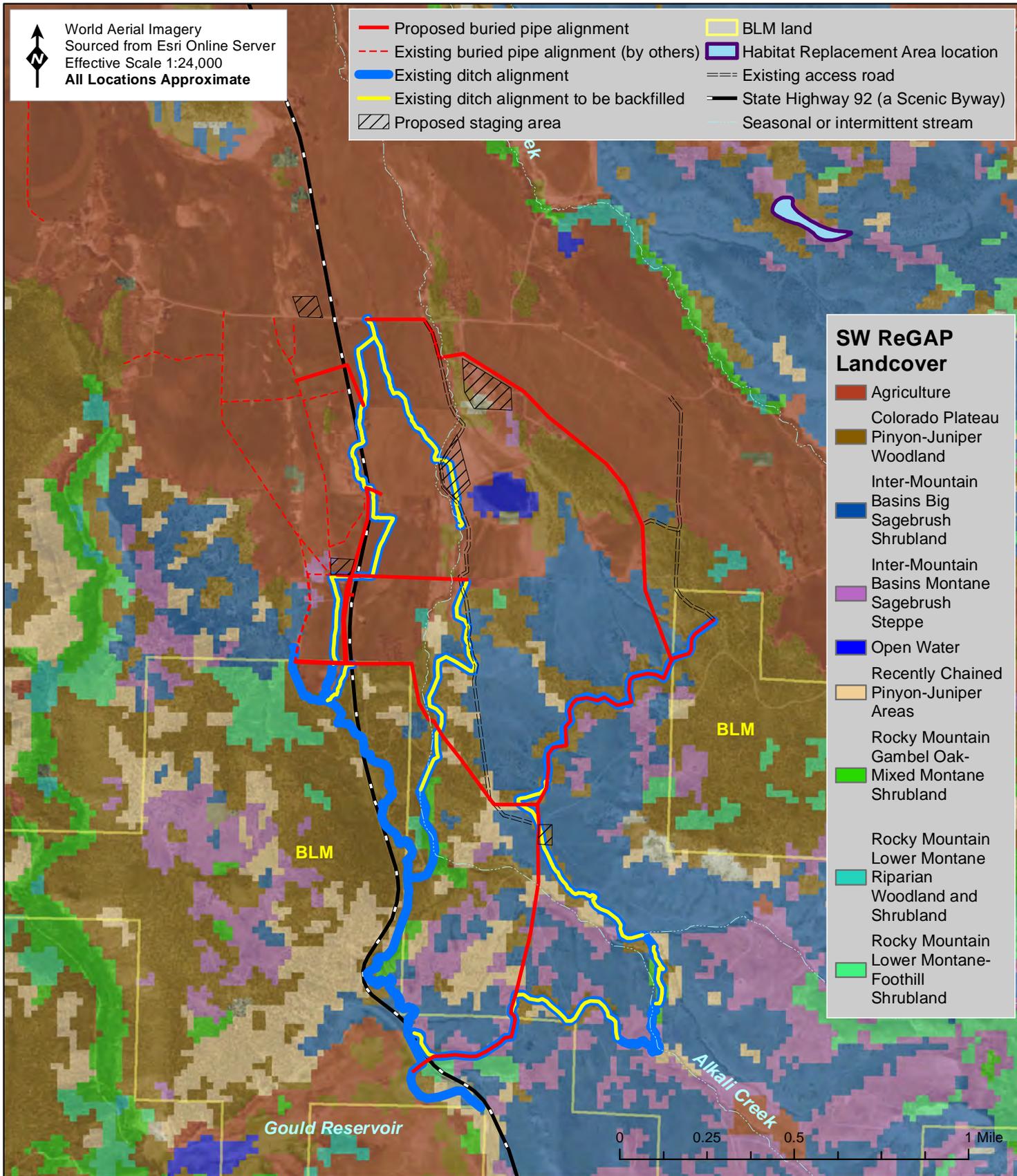
**CATTLEMAN'S DITCHES PIPELINE PROJECT
ENVIRONMENTAL ASSESSMENT
Montrose County, Colorado**

**FIGURE
3**

World Aerial Imagery
 Sourced from Esri Online Server
 Effective Scale 1:24,000
 All Locations Approximate

- Proposed buried pipe alignment
- - - Existing buried pipe alignment (by others)
- Existing ditch alignment
- Existing ditch alignment to be backfilled
- Proposed staging area
- BLM land
- Habitat Replacement Area location
- = = = Existing access road
- State Highway 92 (a Scenic Byway)
- Seasonal or intermittent stream

- SW ReGAP Landcover**
- Agriculture
 - Colorado Plateau Pinyon-Juniper Woodland
 - Inter-Mountain Basins Big Sagebrush Shrubland
 - Inter-Mountain Basins Montane Sagebrush Steppe
 - Open Water
 - Recently Chained Pinyon-Juniper Areas
 - Rocky Mountain Gambel Oak-Mixed Montane Shrubland
 - Rocky Mountain Lower Montane Riparian Woodland and Shrubland
 - Rocky Mountain Lower Montane-Foothill Shrubland



DATE: April 2015
 DRAWN BY: D. Reeder

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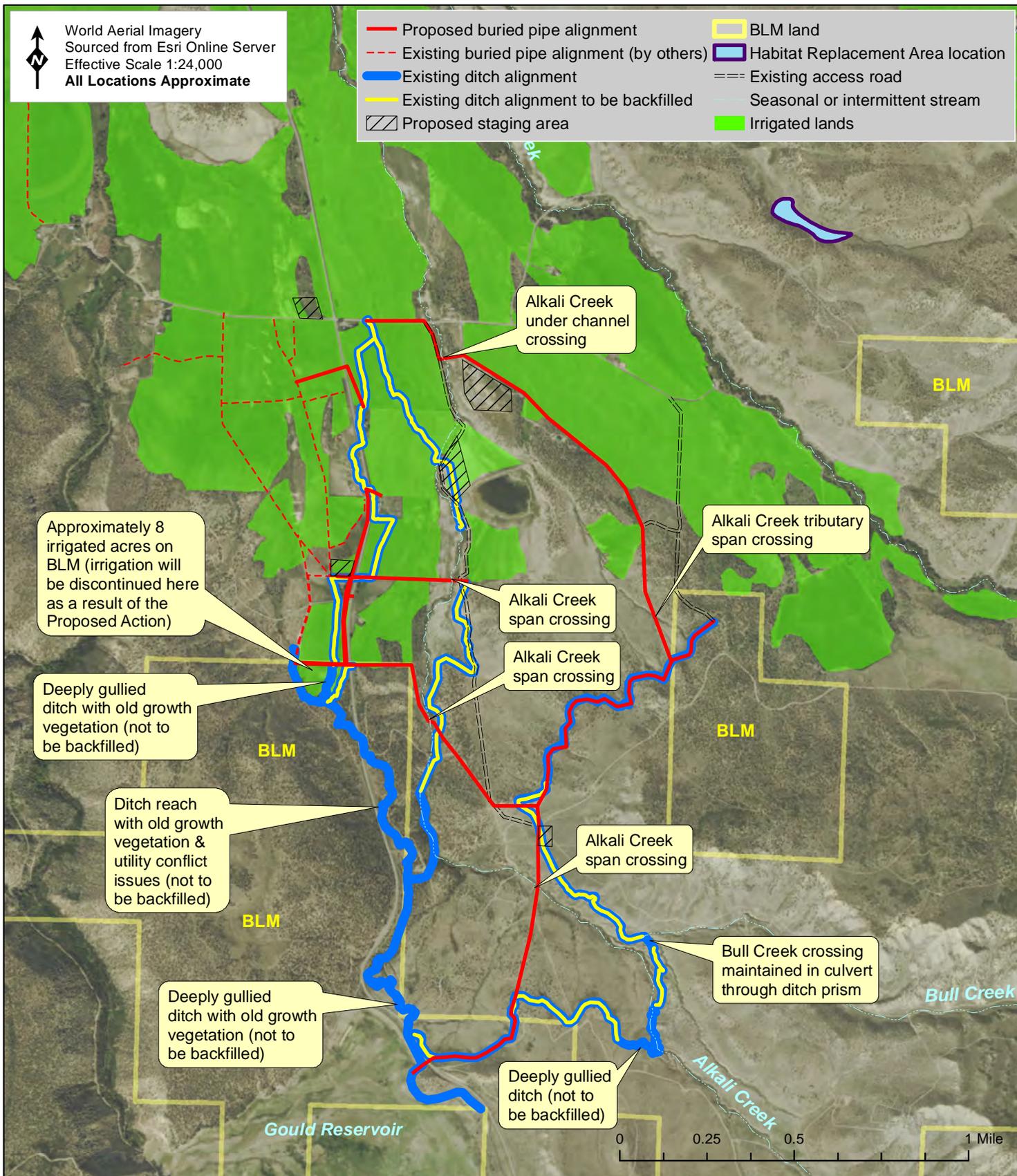
**LANDCOVER IN THE
 PROJECT VICINITY**

**CATTLEMAN'S DITCHES PIPELINE PROJECT
 ENVIRONMENTAL ASSESSMENT
 Montrose County, Colorado**

**FIGURE
 4**

World Aerial Imagery
 Sourced from Esri Online Server
 Effective Scale 1:24,000
 All Locations Approximate

- Proposed buried pipe alignment
- - - Existing buried pipe alignment (by others)
- Existing ditch alignment
- Existing ditch alignment to be backfilled
- Proposed staging area
- BLM land
- Habitat Replacement Area location
- Existing access road
- Seasonal or intermittent stream
- Irrigated lands

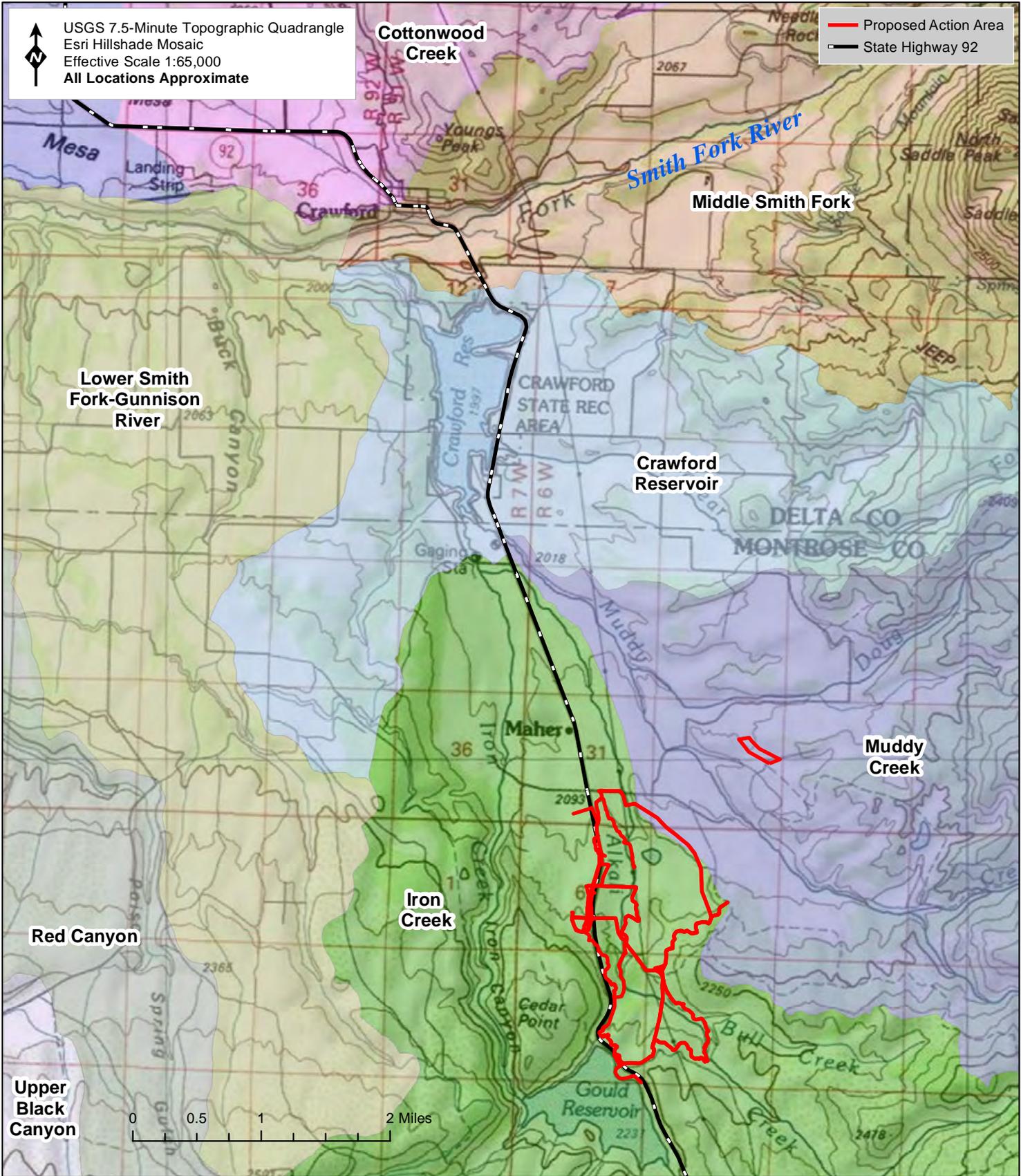


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**IRRIGATED LANDS & OTHER
 VEGETATION ELEMENTS**
**CATTLEMAN'S DITCHES PIPELINE PROJECT
 ENVIRONMENTAL ASSESSMENT
 Montrose County, Colorado**

**FIGURE
 4a**



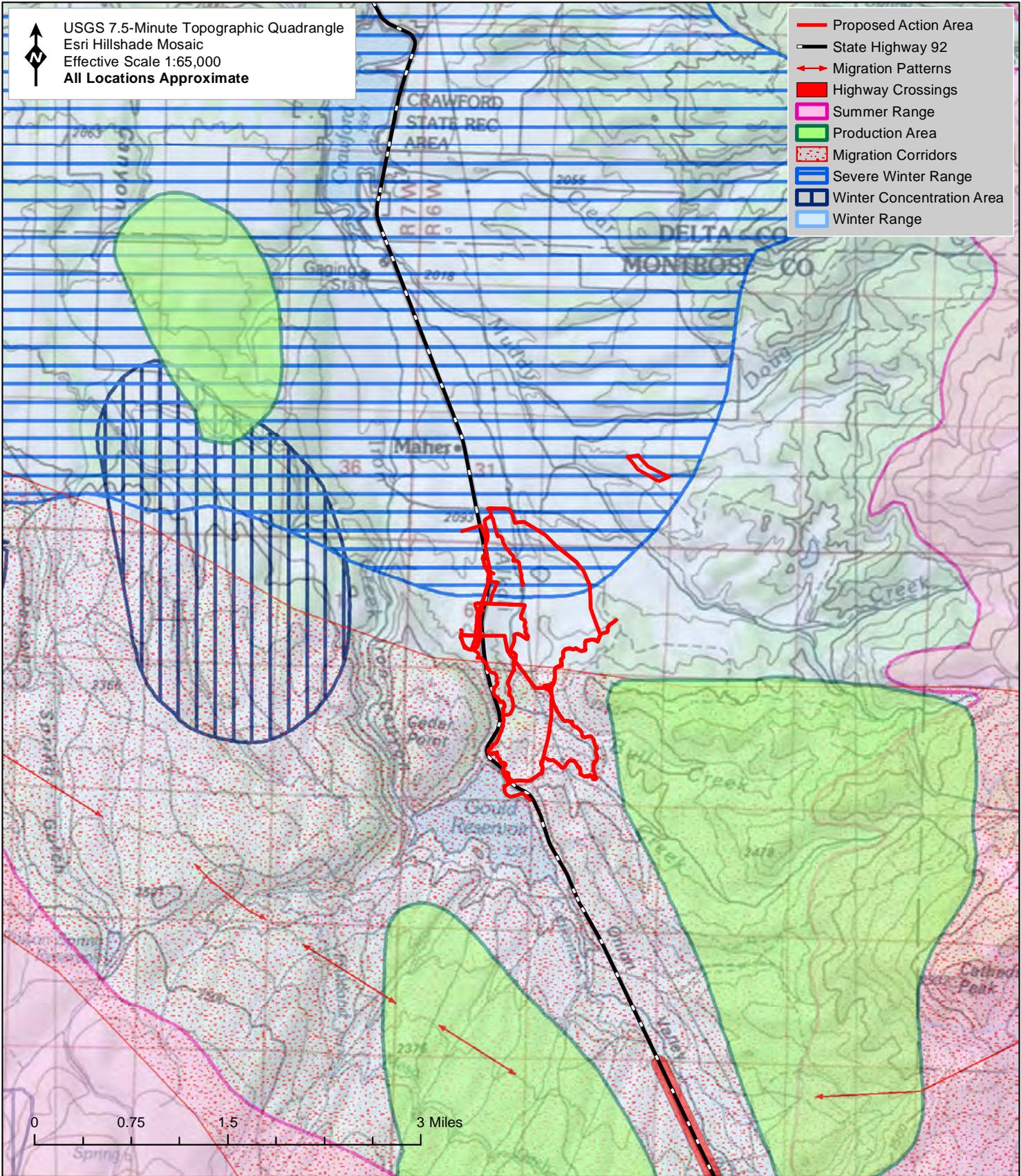
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**HYDROLOGIC UNIT MAP
 OF THE PROJECT VICINITY**

**CATTLEMAN'S DITCHES PIPELINE PROJECT
 ENVIRONMENTAL ASSESSMENT
 Montrose County, Colorado**

**FIGURE
 5**

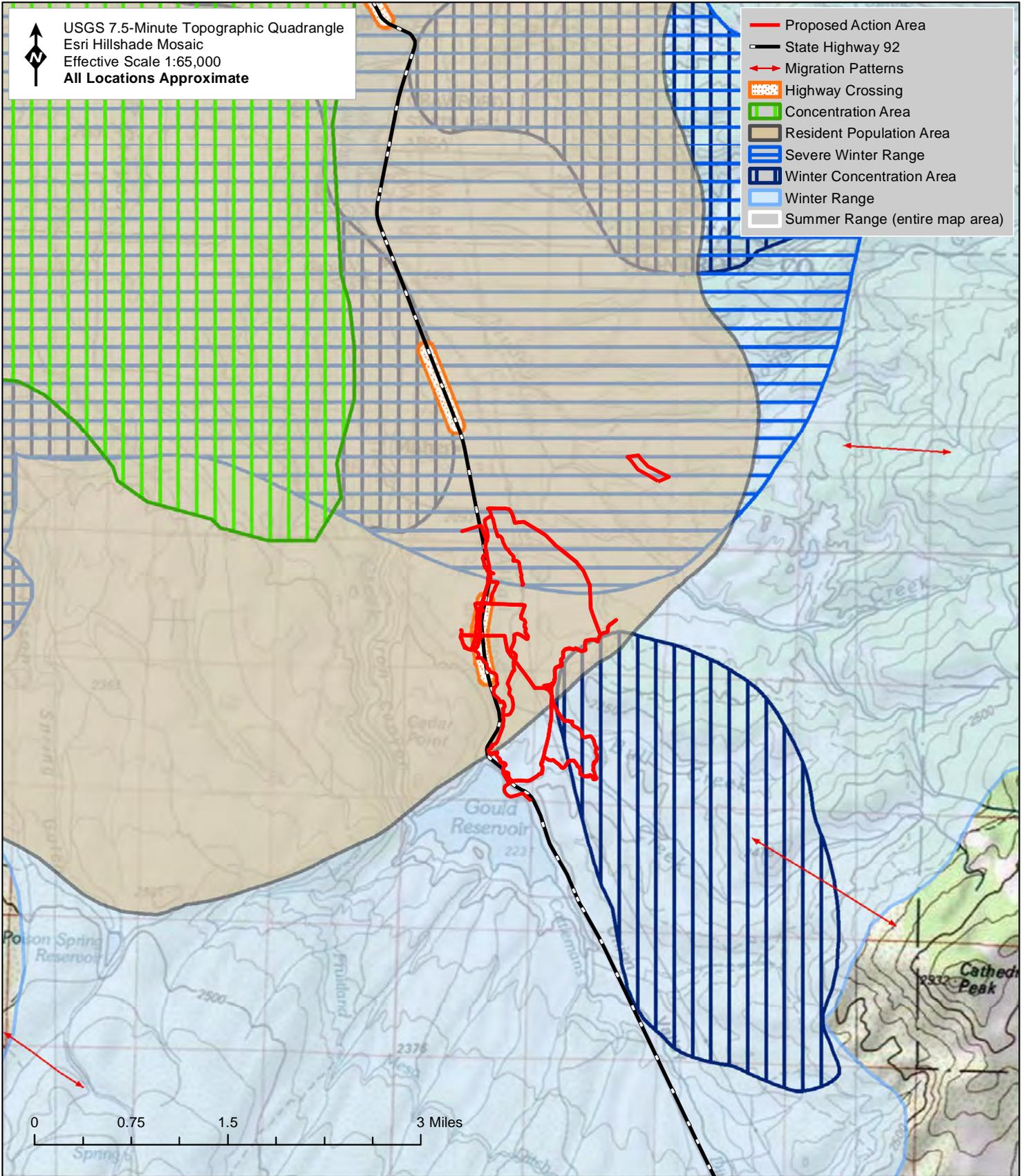


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ELK RANGE
CATTLEMAN'S DITCHES PIPELINE PROJECT
ENVIRONMENTAL ASSESSMENT
Montrose County, Colorado

FIGURE
6



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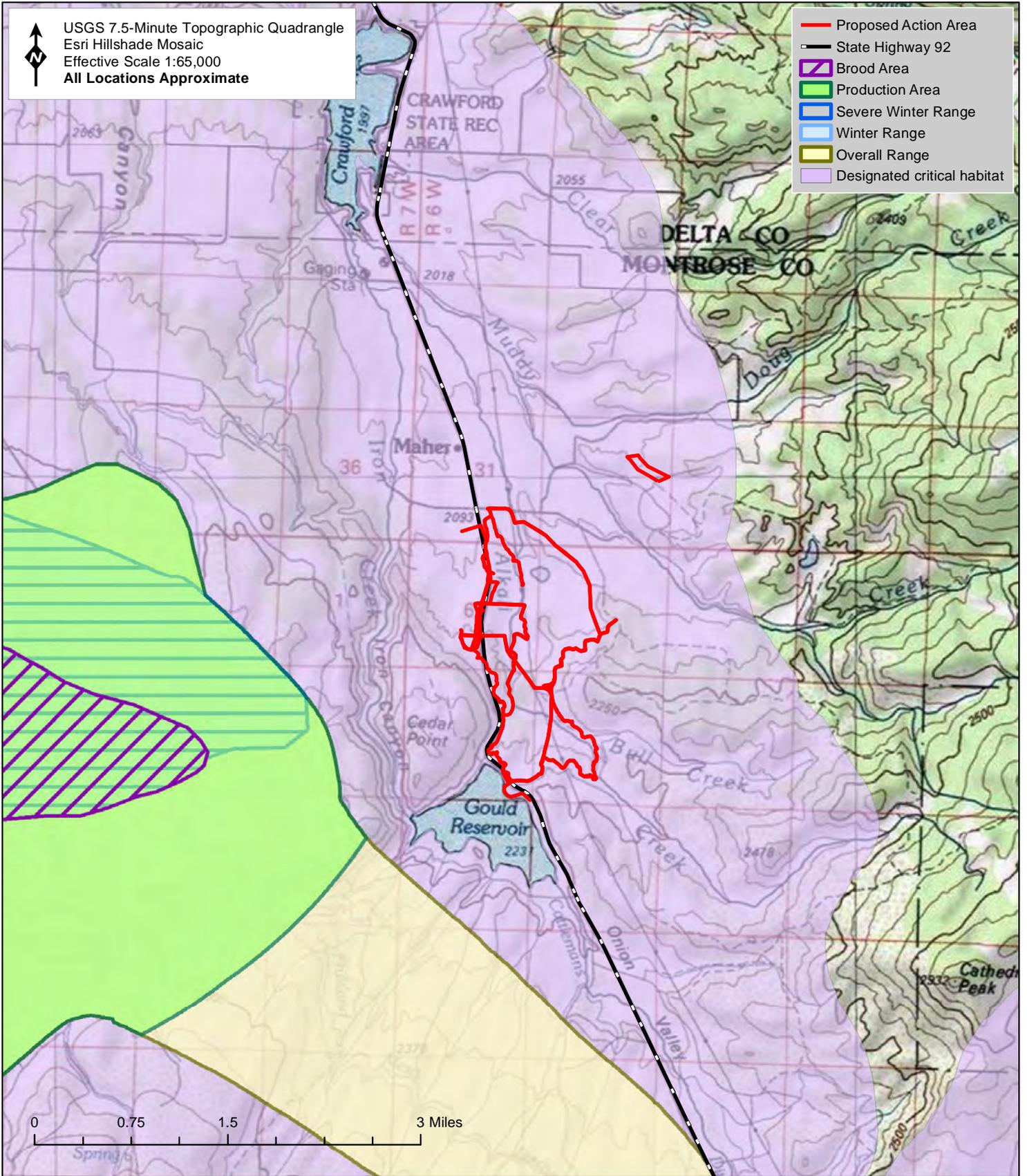
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MULE DEER RANGE
CATTLEMAN'S DITCHES PIPELINE PROJECT
ENVIRONMENTAL ASSESSMENT
 Montrose County, Colorado

FIGURE
7

USGS 7.5-Minute Topographic Quadrange
 Esri Hillshade Mosaic
 Effective Scale 1:65,000
 All Locations Approximate

- Proposed Action Area
- State Highway 92
- Brood Area
- Production Area
- Severe Winter Range
- Winter Range
- Overall Range
- Designated critical habitat



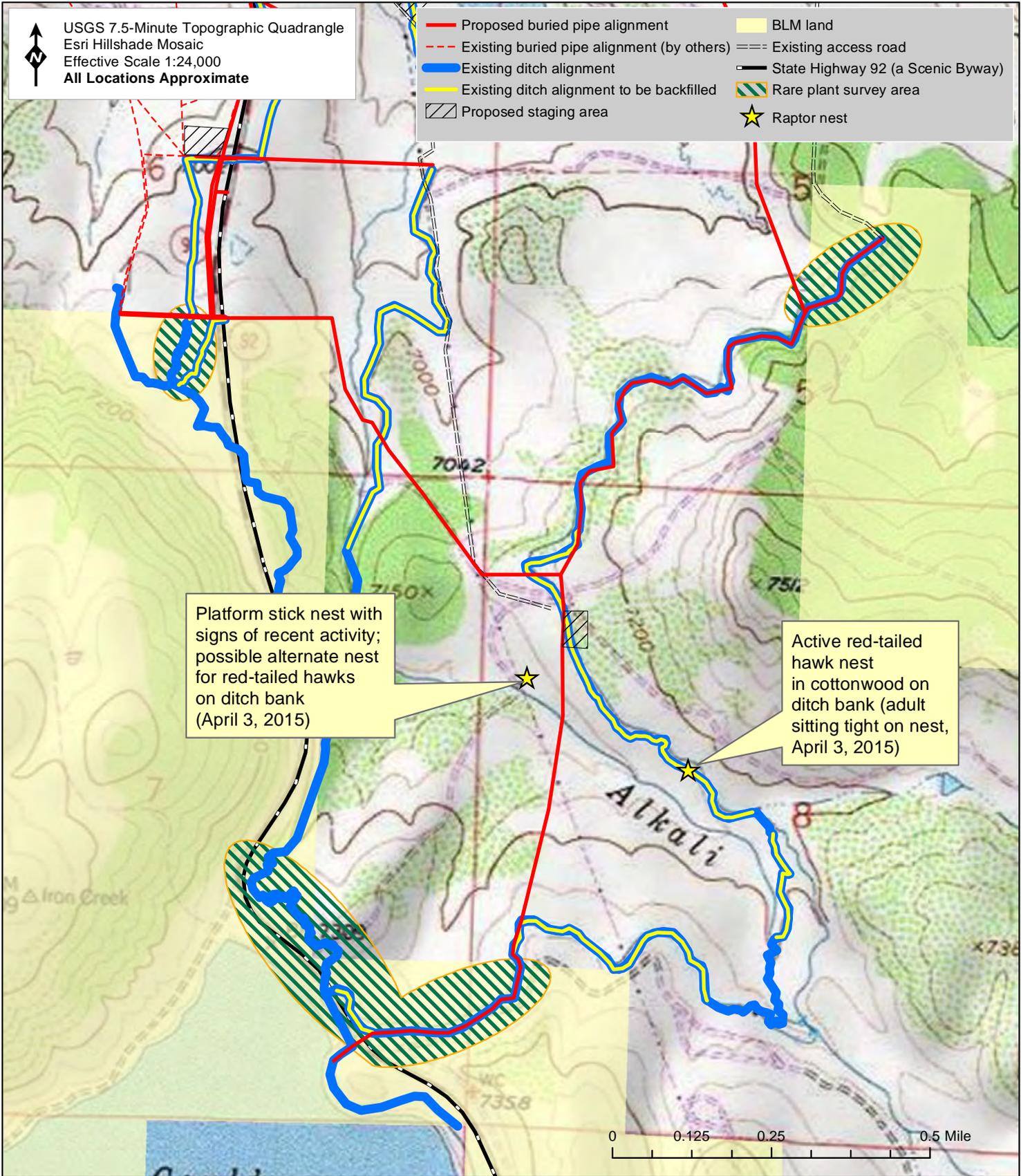
0 0.75 1.5 3 Miles

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GUNNISON SAGE-GROUSE RANGE
 CATTLEMAN'S DITCHES PIPELINE PROJECT
 ENVIRONMENTAL ASSESSMENT
 Montrose County, Colorado

FIGURE 8

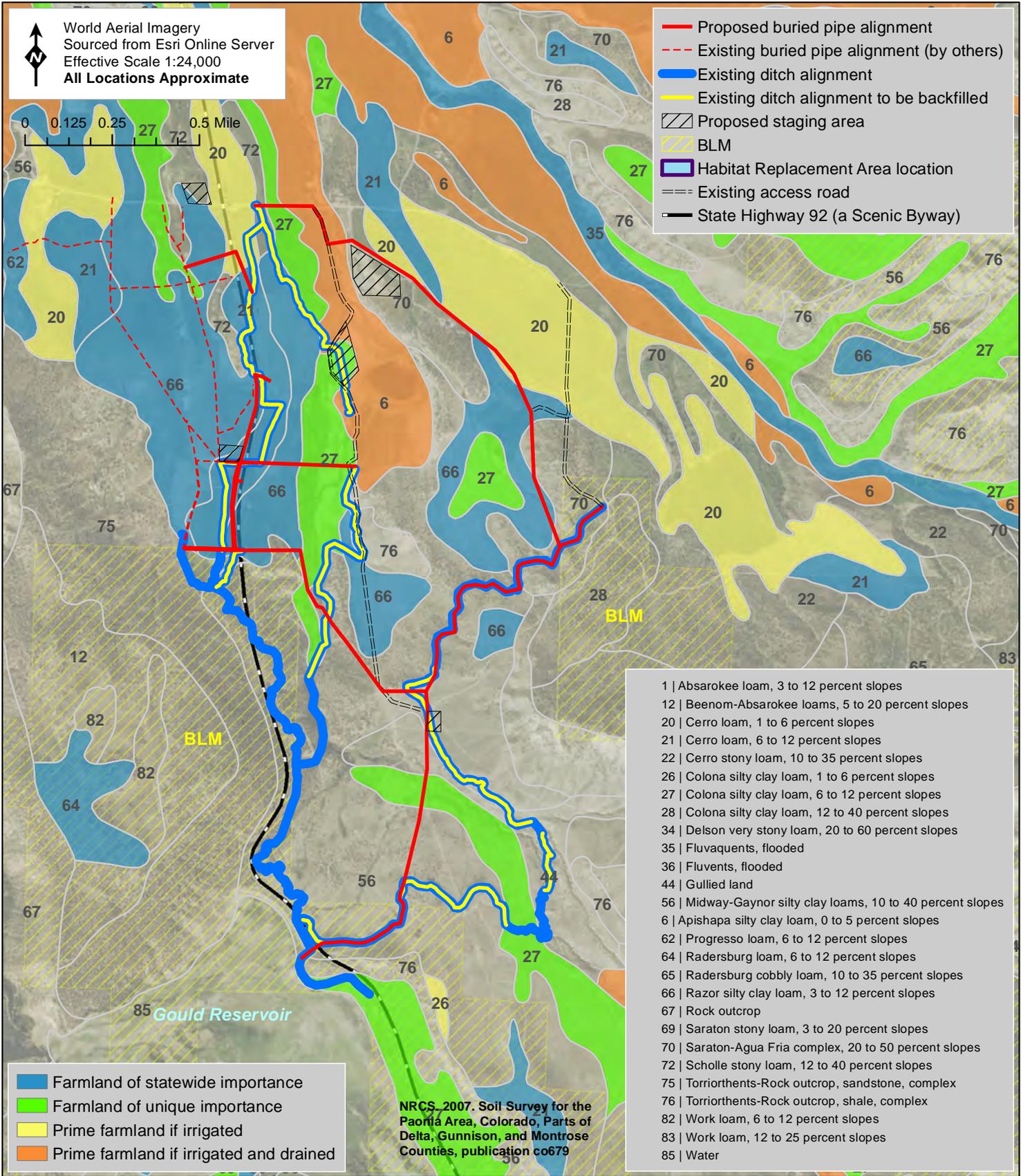


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RARE PLANT SURVEY & RAPTOR NEST LOCATIONS
CATTLEMAN'S DITCHES PIPELINE PROJECT ENVIRONMENTAL ASSESSMENT
 Montrose County, Colorado

FIGURE 9



DATE: April 2015
DRAWN BY: D. Reeder

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SOILS OF AGRICULTURAL SIGNIFICANCE
CATTLEMAN'S DITCHES PIPELINE PROJECT ENVIRONMENTAL ASSESSMENT
Montrose County, Colorado

FIGURE 10

ATTACHMENT A

Distribution List

All shareholders of Cedar Springs Iron Canon Ditch & Reservoir Company
All landowners within a 0.5-mile radius of the Proposed Action (total of 34)
Cathedral Domestic Water Company
Cathedral Peak Ranch Subdivision Association
Cedar Canyon Iron Springs Irrigation Co.
Citizens for a Healthy Community
Colorado Department of Transportation
Colorado Historical Society
Colorado Parks and Wildlife
Colorado Parks and Wildlife - Crawford Reservoir
Colorado River Water Conservation District
Colorado Water Conservation Board
Crawford Area Chamber of Commerce
Delta Montrose Electric Association
Montrose County Planning & Development
Montrose County Road & Bridge
Montrose Daily Press
The North Fork Merchant Herald
Town of Crawford
U.S. Army Corps of Engineers
U.S. Bureau of Land Management
U.S. Department of Agriculture Natural Resources Conservation Service
U.S. Department of Energy Western Area Power Admin.
U.S. Fish and Wildlife Service
Western Slope Conservation Center

ATTACHMENT B

Clean Water Act Exemptions Documentation



US Army Corps of Engineers

Sacramento District
1325 J Street
Sacramento, CA 95814-2922

Irrigation Exemption Summary

FARM OR STOCK POND OR IRRIGATION DITCH CONSTRUCTION OR MAINTENANCE

Pursuant to Section 404 of the Clean Water Act (33 USC 1344) and Federal Regulations (33 CFR 323.4(a)(3)), certain discharges for the construction or maintenance of farm or stock ponds or irrigation ditches have been exempted from requiring a Section 404 permit. Included in the exemption are the construction or maintenance of farm or stock ponds or irrigation ditches, or the maintenance (but not the construction) of drainage ditches. Discharges associated with siphons, pumps, headgates, wingwalls, weirs, diversion structures, and such other facilities as are appurtenant and functionally related to irrigation ditches are included in this exemption.

A Section 404 permit is required if either of the following occurs:

- (1) Any discharge of dredged or fill material resulting from the above activities which contains any toxic pollutant listed under Section 307 of the Clean Water Act shall be subject to any applicable toxic effluent standard or prohibition, and shall require a permit.
- (2) Any discharge of dredged or fill material into waters of the United States incidental to the above activities must have a permit if it is part of an activity whose purpose is to convert an area of the waters of the United States into a use to which it was not previously subject, where the flow or circulation of waters of the United States may be impaired or the reach of such waters reduced. Where the proposed discharge will result in significant discernible alterations to flow or circulation, the presumption is that flow or circulation may be impaired by such alteration. For example, a permit will be required for the conversion of a wetland from silvicultural to agricultural use when there is a discharge of dredged or fill material into waters of the United States in conjunction with construction of dikes, drainage ditches, or other works or structures used to effect such conversion. A discharge which elevates the bottom of waters of the United States without converting it to dry land does not thereby reduce the reach of, but may alter the flow or circulation of, waters of the United States.

If the proposed discharge satisfies all of the above restrictions, it is automatically exempted and no further permit action from the Corps of Engineers is required. If any of the restrictions of this exemption will not be complied with, a permit is required and should be requested using ENG Form 4345 (Application for a Department of the Army permit). A nationwide permit authorized by the Clean Water Act may be available for the proposed work. State or local approval of the work may also be required.

For general information on the Corps' Regulatory Program please check our web site at www.spk.army.mil/regulatory. For additional information or for a written determination regarding a specific project, please contact the Corps at the following addresses:

| | |
|--|----------------|
| Sacramento Main Office-1325 J Street, Room 1480, Sacramento, CA 95814 | (916) 557-5250 |
| Redding Field Office-152 Hartnell, Redding, CA 96002 | (530) 223-9534 |
| Reno Office-300 Booth Street, Room 2103, Reno, NV 89509 | (775) 784-5304 |
| Intermountain Region Main Office-533 West 2600 South, Suite 150, Bountiful, UT 84010 | (801) 295-8380 |
| Colorado/Gunnison Basin Office-402 Rood Ave., Room 142, Grand Junction, CO 81501 | (970) 243-1199 |
| Durango Office-278 Sawyer Dr., Unit #1, Durango, CO 81301 | (970) 375-9506 |
| Frisco Office-301 W Main, Suite 202, P.O. Box 607, Frisco, CO 80443 | (970) 668-9676 |
| St. George Office-321 North Mall Drive, Suite L-101, St. George, UT 84790 | (435) 986-3979 |



US Army Corps of Engineers

Sacramento District
1325 J Street
Sacramento, CA 95814-2922

Maintenance Exemption Summary

Maintenance (Including Emergency Reconstruction)

Pursuant to Section 404 of the Clean Water Act (33 USC 1344) and Federal Regulations (33 CFR 323.4(a)(2)), certain discharges for the maintenance, including emergency reconstruction of recently damaged parts, of currently serviceable structures such as dikes, dams, levees, groins, riprap, breakwaters, causeways, bridge abutments or approaches, and transportation structures, have been exempted from requiring a Section 404 permit. Maintenance does not include any modification that changes the character, scope, or size of the original fill design. Emergency reconstruction must occur within a reasonable period of time after damage occurs in order to qualify for this exemption.

A Section 404 permit is required if either of the following occurs:

- (1) Any discharge of dredged or fill material resulting from the above activities which contains any toxic pollutant listed under Section 307 of the Clean Water Act shall be subject to any applicable toxic effluent standard or prohibition, and shall require a permit.
- (2) Any discharge of dredged or fill material into waters of the United States incidental to the above activities must have a permit if it is part of an activity whose purpose is to convert an area of the waters of the United States into a use to which it was not previously subject, where the flow or circulation of waters of the United States may be impaired or the reach of such waters reduced. Where the proposed discharge will result in significant discernible alterations to flow or circulation, the presumption is that flow or circulation may be impaired by such alteration. For example, a permit will be required for the conversion of a wetland from silvicultural to agricultural use when there is a discharge of dredged or fill material into waters of the United States in conjunction with construction of dikes, drainage ditches, or other works or structures used to effect such conversion. A conversion of a Section 404 wetland to a non-wetland is a change of use of an area of waters of the United States. A discharge which elevates the bottom of waters of the United States without converting it to dry land does not thereby reduce the reach of, but may alter the flow or circulation of, waters of the United States.

If the proposed discharge satisfies all of the above restrictions, it is automatically exempted and no further permit action from the Corps of Engineers is required. If any of the restrictions of this exemption will not be complied with, a permit is required and should be requested using ENG Form 4345 (Application for a Department of the Army permit). A nationwide permit authorized by the Clean Water Act may be available for the proposed work. State or local approval of the work may also be required.

For general information on the Corps' Regulatory Program please check our web site at www.spk.army.mil/regulatory.html. For additional information or for a written determination regarding a specific project, please contact the Corps at the following addresses:

| | |
|--|----------------|
| Sacramento Main Office-1325 J Street, Room 1480, Sacramento, CA 95814 | (916) 557-5250 |
| Redding Field Office-152 Hartnell, Redding, CA 96002 | (530) 223-9534 |
| Reno Office-300 Booth Street, Room 2103, Reno, NV 89509 | (775) 784-5304 |
| Intermountain Region Main Office-533 West 2600 South, Suite 150, Bountiful, UT 84010 | (801) 295-8380 |
| Colorado/Gunnison Basin Office-402 Rood Ave., Room 142, Grand Junction, CO 81501 | (970) 243-1199 |
| Durango Office-278 Sawyer Dr., Unit #1, Durango, CO 81301 | (970) 375-9506 |
| Frisco Office-301 W Main, Suite 202, P.O. Box 607, Frisco, CO 80443 | (970) 668-9676 |
| St. George Office-321 North Mall Drive, Suite L-101, St. George, UT 84790 | (435) 986-3979 |

Updated OCT 2005

ATTACHMENT C

Habitat Impact Evaluation & Methodology

**Habitat Impacts Of The Proposed
Cedar Canon Iron Spring Ditch
(Cattleman's Ditch) Piping Project**

By Michael Zeman

Wildlife and Natural Resource Concepts & Solutions, LLC

April 13, 2015

The Cedar Canon Iron Spring Ditch Company in cooperation with the Bureau of Reclamation have proposed a piping project which will replace approximately 5.6 miles of open ditch with underground pipe on the Cedar Canon Iron Spring Ditch (also known as Cattleman's Ditch). An additional 4 miles of underground pipe will be laid outside the existing Cedar Canon Iron Spring Ditch. The elevation of the project site is approximately 7200 feet and located south of Crawford, Colorado.

The project will be built along the edge of irrigated farm lands and in piñon-juniper covered foothills. Juniper trees, rabbit brush, sagebrush, willow, and wild rose are the most prevalent types of vegetations found along the ditch. Other plant species observed in the project area include: cottonwoods; mountain mahogany; antelope bitterbrush; four-winged saltbush; prickly pear cactus; bulrush; carex; yellow clover; and a number of small forbs & grasses. Invasive weeds encountered include: Canada thistle; Russian knapweed; musk thistle, chicory; cheat grass; milkweed; burdock; kochia; and mullein.

Many riparian plant species found along the ditch will be lost when the ditch is piped. Some plants will be destroyed during the construction phase and others will die due to lack of water after the ditch is piped. Areas disturbed will be reseeded and a weed control program will be put in place. In some of the weedier areas, the habitat should actually be better after the project than before. This is shown in H8 of the Habitat Quality Scoring table. The majority of the construction will occur in the current ditch right-of-way where water sources outside the ditch are limited. There are a few segments of the ditch piping that are located in natural drainages or along irrigated fields, and the effects on this habitat should be minimal. Approximately 4 miles of pipeline will be constructed outside the current ditch easement (across irrigated fields and in drier upland areas). These are shown as habitat sections: H19, H20, H21, H22, H25 & H26 (See *Cedar Canon Iron Spring Ditch Habitat Areas April 13, 2015*). There is very little riparian habitat in these sections and the habitat value is of lower quality. The effects of this additional piping should be minimal as the piping footprint will be replanted with a mixture of forbs, grasses, and shrubs. This additional piping will create a more efficient water delivery system and help avoid some riparian areas. All sections of the ditch were initially scheduled to be backfilled. After further evaluation, it has been determined that backfilling the entire ditch would destroy some of the best riparian habitat and could be detrimental to the restoration process. A preferred alternative would be to abandon the following habitat areas: H14A, H16, H17, H18, H23, H24, and the lower portion of H3 (See *Cedar Canon Iron Spring Ditch - Ditch Segments To Be Abandoned April 13, 2015*) and not backfill them. These sections contain large quantities of riparian vegetation that could survive with water provided by existing water sources found outside of the ditch. While the quality of the habitat will be diminished somewhat by the loss of irrigation water, abandoning the ditch it is a much more preferable option than filling the ditch back in and trying to reseed it.

Backfilling these segments of the ditch would destroy many existing cottonwoods, willows, and wetland species that are very desirable for wildlife. Getting into the areas would require bulldozing trees and shrubs while exposing the areas to erosion and the high probability that non-native weed species would invade the area. Successfully revegetating the area would be more difficult because there will not be the additional water from the irrigation ditch to get new vegetation started. There are minimal weed species in the areas proposed for abandonment and could be treated with personnel using hand or backpack sprayers.

Five staging areas for equipment and pipe storage were proposed and have been evaluated for possible wildlife habitat impacts. It was determined that all five staging areas should have no significant impact on habitat. One site is located within a current gravel quarry and the other four are located on existing fields that could be easily put back into production after the project has been completed.

After the project is completed; all disturbed, abandoned, and backfilled areas will be reseeded with native plant species as needed and the areas monitored for non-native, invasive weed species. A weed management plan should be developed and followed in order to help address any weed issues that arise. This plan needs to meet all state and county weed control criteria.

Much of the proposed piping route crosses pinion-juniper hillside or along and through irrigated grass meadows. This habitat is used by both deer and elk in the summer and winter. It is also home to many types of small mammals (skunks, rabbits, prairie dogs, coyotes, meadow voles & etc.) as well as many types of birds (crows, magpies, raptors, pinion jays, song birds, and migratory waterfowl).

A total of 15.66 habitat units* are expected to be lost due to the Cedar Canon Iron Spring Piping Project if the preferred alternative is implemented - See table labeled *Habitat Quality Scoring Cedar Canon Iron Spring Ditch (Cattleman's Ditch) Proposed Piping Project With Portions Of The Ditch Abandoned*. The habitat credit loss was based on the current piping plan and the assumption that the ditch would be backfilled with the exception of the habitat sections listed in the preferred alternative above. The habitat units lost goes up about 25% (20.14 habitat credits) if the entire ditch is backfilled. Other ways to minimize impacts to habitat along the piping corridor would be to: avoid the removal of trees as much as possible when installing the pipe; choose proper species of plants & replanting methods when reclaiming the area over the pipeline; and implementing an effective weed control program in any areas disturbed.

* Calculations were made using criteria set forth in the *Basinwide Salinity Control Program: Procedures for Habitat Replacement* - (A manual developed in 2010 by the Bureau of Reclamation and U.S. Fish & Wildlife Service, and attached to this report).

4/13/2015

Habitat Quality Scoring
Cedar Canon Iron Spring Ditch (Cattleman's Ditch)
Proposed Piping Project
With Portions Of The Ditch Abandoned

| Habitat Site | H 1 | | H 2 | | H3 A | | H3 B *** | | H 4 | | H 5 | | H 6 | | H 7 | |
|--------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | Before | After |
| Mapped Acres/Adjustment | 2.29 | 100% | 1.61 | 100% | 0.10 | 100% | 0.47 | 100% | 0.51 | 100% | 1.51 | 100% | 0.30 | 100% | 3.28 | 100% |
| Vegetation Diversity | 6 | 4 | 7 | 3 | 5 | 3 | 5 | 3 | 5 | 3 | 6 | 4 | 4 | 3 | 6 | 4 |
| Stratification | 10 | 10 | 10 | 10 | 10 | 6 | 10 | 6 | 10 | 10 | 10 | 6 | 6 | 6 | 10 | 10 |
| Native vs. Non-Native species | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| Noxious Weeds | 8 | 8 | 9 | 9 | 9 | 9 | 9 | 9 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| Overall Vegetative Condition | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Disease Additional scoring | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Interspersion of open water | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| Connectivity | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Uniqueness or Abundance | 4 | 3 | 7 | 3 | 4 | 5 | 4 | 5 | 4 | 3 | 6 | 3 | 4 | 3 | 5 | 3 |
| Water Supply | 6 | 1 | 6 | 2 | 6 | 1 | 6 | 1 | 6 | 2 | 6 | 2 | 6 | 1 | 6 | 2 |
| Alteration | 8 | 8 | 4 | 4 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 7 | 7 | 8 | 8 |
| Raw Scores | 66 | 57 | 67 | 54 | 68 | 57 | 68 | 57 | 66 | 58 | 69 | 55 | 59 | 51 | 67 | 58 |
| Habitat Quality Score (HQS) | 6.6 | 5.7 | 6.7 | 5.4 | 6.8 | 5.7 | 6.8 | 5.7 | 6.6 | 5.8 | 6.9 | 5.5 | 5.9 | 5.1 | 6.7 | 5.8 |
| Habitat Score Difference | 0.90 | | 1.30 | | 1.10 | | 1.10 | | 0.80 | | 1.40 | | 0.80 | | 0.90 | |
| Habitat Credits Lost | 2.06 | | 2.09 | | 0.11 | | 0.52 | | 0.41 | | 2.11 | | 0.24 | | 2.95 | |

| Habitat Site | H 8 | | H9 | | H10 | | H11 | | H12 | | H13 | | 14A *** | | H14B *** | | H15 | |
|--------------------------------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | Before | After | Before | After | Before | After | Before | After | Before | After | Before | After | Before | After | Before | After | Before | After |
| Mapped Acres/Adjustment | 0.45 | 100% | 0.90 | 100% | 0.53 | 100% | 0.11 | 100% | 1.24 | 100% | 1.09 | 100% | 0.17 | 100% | 0.37 | 100% | 0.39 | 100% |
| Vegetation Diversity | 3 | 3 | 7 | 4 | 4 | 3 | 5 | 4 | 2 | 1 | 2 | 2 | 4 | 1 | 4 | 1 | 4 | 3 |
| Stratification | 6 | 6 | 10 | 10 | 6 | 6 | 6 | 6 | 6 | 2 | 2 | 2 | 10 | 8 | 10 | 8 | 10 | 10 |
| Native vs. Non-Native species | 6 | 8 | 9 | 8 | 9 | 9 | 5 | 5 | 4 | 2 | 2 | 2 | 4 | 2 | 4 | 2 | 9 | 9 |
| Noxious Weeds | 2 | 8 | 9 | 9 | 9 | 9 | 2 | 8 | 8 | 9 | 7 | 9 | 8 | 9 | 8 | 9 | 9 | 9 |
| Overall Vegetative Condition | 10 | 10 | 9 | 9 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Disease Additional scoring | 0 | 0 | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Interspersion of open water | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| Connectivity | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Uniqueness or Abundance | 3 | 3 | 8 | 6 | 5 | 3 | 4 | 4 | 3 | 2 | 3 | 2 | 4 | 2 | 4 | 2 | 4 | 3 |
| Water Supply | 6 | 2 | 6 | 2 | 6 | 1 | 6 | 2 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 4 | 2 |
| Alteration | 9 | 9 | 9 | 9 | 5 | 5 | 6 | 6 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 6 |
| Raw Scores | 51 | 54 | 82 | 72 | 60 | 51 | 50 | 50 | 49 | 41 | 41 | 41 | 55 | 46 | 55 | 46 | 62 | 57 |
| Habitat Quality Score (HQS) | 5.1 | 5.4 | 8.2 | 7.2 | 6.0 | 5.1 | 5.0 | 5.0 | 4.9 | 4.1 | 4.1 | 4.1 | 5.5 | 4.6 | 5.5 | 4.6 | 6.2 | 5.7 |
| Habitat Score Difference | -0.30 | | 1.00 | | 0.90 | | 0.00 | | 0.80 | | 0.00 | | 0.90 | | 0.90 | | 0.50 | |
| Habitat Credits Lost | -0.13 | | 0.90 | | 0.48 | | 0.00 | | 0.99 | | 0.00 | | 0.15 | | 0.33 | | 0.20 | |

| Habitat Site | H16 | | H17 *** | | H18 *** | | H19 | | H20 | | H21 | | H22 | | H23 *** | |
|-------------------------------|--------|-------|---------|-------|---------|-------|--------|-------|--------|-------|--------|-------|--------|-------|---------|-------|
| Mapped Acres/Adjustment | 0.95 | 100% | 2.19 | 100% | 0.59 | 100% | 3.27 | 100% | 0.90 | 100% | 0.88 | 100% | 2.70 | 100% | 1.58 | 100% |
| | Before | After | Before | After | Before | After | Before | After | Before | After | Before | After | Before | After | Before | After |
| Vegetation Diversity | 4 | 3 | 7 | 6 | 4 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 4 | 4 | 7 | 7 |
| Stratification | 10 | 10 | 10 | 10 | 10 | 8 | 10 | 10 | 4 | 4 | 10 | 10 | 10 | 10 | 10 | 10 |
| Native vs. Non-Native species | 9 | 9 | 9 | 9 | 9 | 9 | 8 | 8 | 3 | 3 | 8 | 8 | 4 | 4 | 9 | 9 |
| Noxious Weeds | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 8 | 8 | 9 | 9 | 8 | 8 | 9 | 9 |
| Overall Vegetative Condition | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Disease Additional scoring | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Interspersion of open water | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Connectivity | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 10 | 10 | 10 | 10 | 5 | 5 |
| Uniqueness or Abundance | 4 | 3 | 8 | 6 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 5 | 5 | 8 | 8 |
| Water Supply | 4 | 2 | 4 | 2 | 4 | 2 | 0 | 0 | 4 | 4 | 0 | 0 | 4 | 4 | 6 | 6 |
| Alteration | 6 | 6 | 6 | 6 | 6 | 6 | 4 | 4 | 4 | 4 | 8 | 8 | 3 | 3 | 8 | 8 |
| Raw Scores | 62 | 57 | 69 | 64 | 62 | 54 | 51 | 51 | 42 | 42 | 60 | 60 | 58 | 58 | 73 | 73 |
| Habitat Quality Score (HQS) | 6.2 | 5.7 | 6.9 | 6.4 | 6.2 | 5.4 | 5.1 | 5.1 | 4.2 | 4.2 | 6.0 | 6.0 | 5.8 | 5.8 | 7.3 | 7.3 |
| Habitat Score Difference | 0.50 | | 0.5 | | 0.8 | | 0 | | 0 | | 0 | | 0 | | 0.0 | |
| Habitat Credits Lost | 0.48 | | 1.10 | | 0.47 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | |

| Habitat Site | H24 *** | | H25 | | H26 | | SA1 | | SA2 | | SA3 | | SA4 | | SA5 | |
|-------------------------------|---------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|
| Mapped Acres/Adjustment | 0.41 | 100% | 1.72 | 100% | 0.21 | 100% | 8.40 | 100% | 2.60 | 100% | 6.10 | 100% | 1.4 | 100% | 1.8 | 100% |
| | Before | After | Before | After | Before | After | Before | After | Before | After | Before | After | Before | After | Before | After |
| Vegetation Diversity | 4 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 |
| Stratification | 10 | 10 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 5 | 4 | 2 | 2 |
| Native vs. Non-Native species | 9 | 9 | 2 | 2 | 2 | 2 | 2 | 2 | 5 | 5 | 5 | 5 | 8 | 8 | 5 | 5 |
| Noxious Weeds | 9 | 9 | 9 | 9 | 9 | 9 | 8 | 8 | 8 | 8 | 9 | 9 | 8 | 9 | 9 | 9 |
| Overall Vegetative Condition | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Disease Additional scoring | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Interspersion of open water | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| Connectivity | 5 | 5 | 5 | 5 | 5 | 5 | 10 | 10 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Uniqueness or Abundance | 4 | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| Water Supply | 4 | 2 | 6 | 6 | 6 | 6 | 0 | 0 | 5 | 5 | 5 | 5 | 0 | 0 | 5 | 5 |
| Alteration | 6 | 6 | 3 | 3 | 3 | 3 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Raw Scores | 62 | 57 | 42 | 42 | 41 | 41 | 33 | 33 | 39 | 39 | 42 | 42 | 42 | 42 | 41 | 41 |
| Habitat Quality Score (HQS) | 6.2 | 5.7 | 4.2 | 4.2 | 4.1 | 4.1 | 3.3 | 3.3 | 3.9 | 3.9 | 4.2 | 4.2 | 4.2 | 4.2 | 4.1 | 4.1 |
| Habitat Score Difference | 0.5 | | 0 | | 0 | | 0.00 | | 0 | | 0 | | 0.0 | | 0 | |
| Habitat Credits Lost | 0.21 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | |

Total Habitat Credits Lost 15.66

* Predicted using criteria set forth in the *Basinwide Salinity Control Program: Procedures for Habitat Replacement* (A manual developed by the Bureau of Reclamation and U.S. Fish and Wildlife Service).

*** Areas that are in the preferred option to abandon.

H - Habitat Area
SA - Staging Area

4/13/2015

Cedar Canon Iron Spring Ditch (Cattleman's Ditch)
Proposed Piping Project - Affected Area
Preferred Option

With Some Ditch Segments Abandoned

| Habitat Segment | Habitat Type | Feet of Ditch | Width of Impact (Ft.) | Acres of impact | Habitat Score Difference | Habitat Credits Lost | |
|----------------------------------|--------------|---------------|-----------------------|-----------------|--------------------------|----------------------|----------------|
| H1 | Shrub/Tree | 3989 | 25 | 2.29 | 0.90 | 2.06 | |
| H2 | Trees/Shrub | 1149 | | 1.61 | 1.30 | 2.09 | |
| H3A | Shrub/Tree | 213 | 20 | 0.10 | 1.10 | 0.11 | |
| H3B | Shrub/Tree | 1018 | 20 | 0.47 | 1.10 | 0.52 | |
| H4 | Shrub/Tree | 1115 | 20 | 0.51 | 0.80 | 0.41 | |
| H5 | Shrub/Tree | 2187 | 30 | 1.51 | 1.40 | 2.11 | |
| H6 | Shrub/Grass | 528 | 25 | 0.30 | 0.80 | 0.24 | |
| H7 | Shrub/Tree | 5716 | 25 | 3.28 | 0.90 | 2.95 | |
| H8 | Shrub/Tree | 781 | 25 | 0.45 | -0.30 | -0.13 | |
| H9 | Shrub/Tree | 1575 | 25 | 0.90 | 1.00 | 0.90 | |
| H10 | Shrub/Grass | 1552 | 15 | 0.53 | 0.90 | 0.48 | |
| H11 | Shrub/Grass | 465 | 10 | 0.11 | 0.00 | 0.00 | |
| H12 | Grass/Forbs | 2701 | 20 | 1.24 | 0.80 | 0.99 | |
| H13 | Grass/shrub | 4768 | 10 | 1.09 | 0.00 | 0.00 | |
| H14A | Shrub/Tree | 760 | 10 | 0.17 | 0.90 | 0.16 | |
| H14B | Shrub/Tree | 1591 | 10 | 0.37 | 0.90 | 0.33 | |
| H15 | Shrub/Tree | 839 | 20 | 0.39 | 0.50 | 0.19 | |
| H16 | Shrub/Tree | 2059 | 20 | 0.95 | 0.50 | 0.47 | |
| H17 | Trees/Shrub | 3176 | 30 | 2.19 | 0.50 | 1.09 | |
| H18 | Shrub/Grass | 1718 | 15 | 0.59 | 0.80 | 0.47 | |
| H19 | Shrub/Tree | 7120 | 20 | 3.27 | 0.00 | 0.00 | |
| H20 | Grass/Shrub | 1968 | 20 | 0.90 | 0.00 | 0.00 | |
| H21 | Shrub/Tree | 1925 | 20 | 0.88 | 0.00 | 0.00 | |
| H22 | Grass/Shrub | 5873 | 20 | 2.70 | 0.00 | 0.00 | |
| H23 | Trees/Shrub | 2297 | 30 | 1.58 | 0.00 | 0.00 | |
| H24 | Shrub/Tree | 893 | 20 | 0.41 | 0.50 | 0.21 | |
| H25 | Shrub/Grass | 3745 | 20 | 1.72 | 0.00 | 0.00 | |
| H26 | Grass/Forbs | 447 | 20 | 0.21 | 0.00 | 0.00 | |
| SA1 | Gravel Pit | | | 8.40 | 0.00 | 0.00 | |
| SA2 | Grass/Forbs | | | 2.60 | 0.00 | 0.00 | |
| SA3 | Grass/Forbs | | | 6.10 | 0.00 | 0.00 | |
| SA4 | Forbs/Shrubs | | | 1.40 | 0.00 | 0.00 | |
| SA5 | Grass/Forbs | | | 1.80 | 0.00 | 0.00 | |
| Total Habitat Credit Loss | | | | | | 15.66 | Credits |

* Predicted using criteria set forth in the *Basinwide Salinity Control Program: Procedures for Habitat Replacement*
(A manual developed by the Bureau of Reclamation and U.S. Fish and Wildlife Service)

H = Habitat Areas

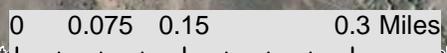
SA = Staging Areas

Cedar Canon Iron Spring Ditch
Habitat Areas
April 13, 2015

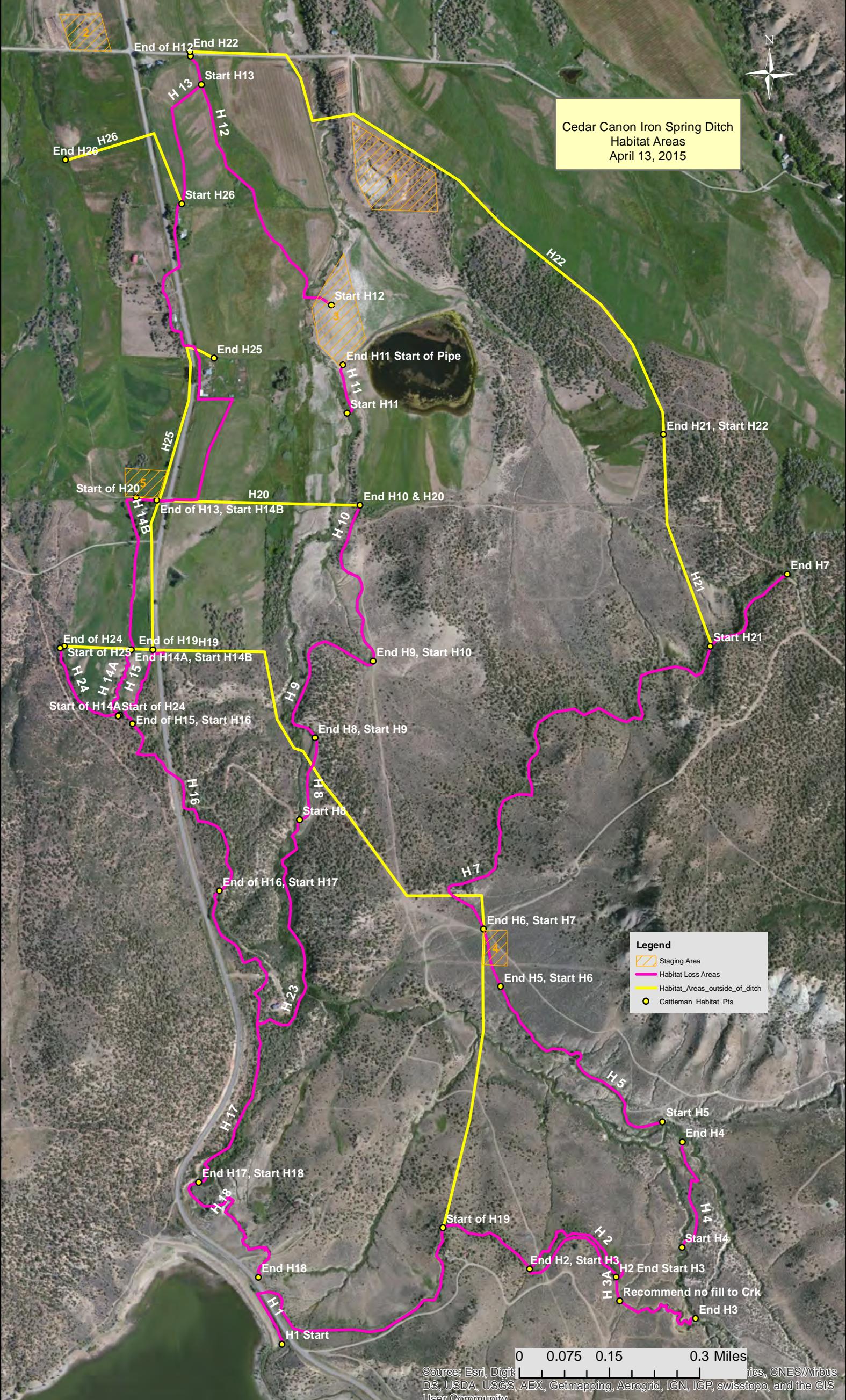


Legend

-  Staging Area
-  Habitat Loss Areas
-  Habitat_Areas_outside_of_ditch
-  Cattleman_Habitat_Pts



Source: Esri, DigitalGlobe, GeoEye, IGN, AerGRID, AIRPHOT, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, IGP, swisstopo, and the GIS User Community



**Cedar Canon Iron Spring Ditch
Ditch Segments To Be Abandoned
April 13, 2015**



Legend

- Cattleman_Habitat_Pts
- ▬▬▬▬ Areas_Not_To_Backfill
- ▬ Habitat Loss Areas



0 0.075 0.15 0.3 Miles

May 2010

Basinwide Salinity Control Program: Procedures for Habitat Replacement

SUMMARY: Habitat Replacement requirements and procedures under salinity control programs were reviewed by a Reclamation-Fish and Wildlife Service team. Inconsistency in habitat replacement is recognized as a problem. Authorities for replacement are presented and past activities reviewed. Avoidance of habitat losses is preferred; where this is not possible, replacement plans should result in no net loss of habitat. A general method of determining habitat losses and replacement needs is presented. Monitoring and record keeping are discussed and an idea for a Funding Opportunity Announcement for habitat replacement is presented.

1. Background

In November 2008, a Habitat Replacement Team (HRT) was formed by Kib Jacobson, the Basinwide Program manager to address the following issues raised in Reclamation's June 27, 2008 Program Review.

In the "Executive Summary" section, it is stated that salinity coordinators and environmental staff will meet with appropriate Fish and Wildlife Service (FWS) staff to:

- Assess the habitat replacement issues identified by Reclamation and the Review Team
- Review and discuss the purpose and conclusions of their [FWS] draft Report
- Develop, implement, and /or institutionalize appropriate standards and definitions
- Discuss FWS's role in the Salinity Program.

In the "Problem Identification" section, the problem/issue was described as follows:

"There appear to be differing standards and definitions for habitat replacement between Reclamation area offices and also with various FWS field offices. This has created the appearance of unequal requirements for applicants and the possibility of some level of unfair competition."

"Specific Questions to be addressed" were:

- "Is this a problem?"
- How can standards and definitions be institutionalized and implemented"?

Additionally, on November 20, 2008, at a meeting in Grand Junction, it was decided that “The team should discuss & resolve issues including the following:

- Definition of replacement
- What are our overall expectations for habitat replacement projects?
- What are the standards?
- What are longevity/long-term requirements?
- What is the Fish and Wildlife Service (FWS) role?
- What are process differences between area offices?
- What happens when a project becomes non-functional; what is the authority to replace those values; is it our policy to be current & proportional?
- What are the EIS requirements and how do they affect what we do?
- Need standard format for reporting each wildlife project which is electronically accessible; should be able to produce summary report indicating where we are as far as current and proportional.
- Should the sponsor implement replacement or should Reclamation conduct a wildlife-only FOA process?”

To conclude this assignment, the HRT was also tasked with developing a document to include:

- What is the authority for habitat replacement?
- Address issues stated above.
- Standard Operating Procedures (SOP)

The team members participating in this exercise were:

| Name | Title | Agency | Location |
|--------------------|-------------------------------------|-------------------------|-----------------|
| Beverley Heffernan | Chief, Environmental Group | Reclamation | Provo |
| Rafael Lopez | Biologist | Reclamation | Provo |
| Rick Krueger | Biologist/Salinity coordinator | Fish & Wildlife Service | Grand Junction |
| Steve McCall | Environmental Specialist | Reclamation | Grand Junction |
| Terry Stroh | Chief, Environment & Planning Group | Reclamation | Grand Junction |
| Kib Jacobson | Manager, CRBSCP | Reclamation | Salt Lake City |
| Scott Elliot | Salinity Coordinator | Reclamation | Provo |
| Ben Radcliffe | Salinity coordinator | Reclamation | Provo |
| Mike Baker | Planner | Reclamation | Grand Junction |

The team developed the material on the following pages to respond to these issues. Two specific questions posed by the Program Review were addressed as follows:

- “Is this a problem (“There appear to be differing standards and definitions for habitat replacement between Reclamation Area Offices and also with various FWS field offices.”)?
Answer: Yes, as the salinity control program has evolved, different offices have followed procedures based on different statutory authorizations. To ensure fulfillment of the statutory requirement to replace wildlife values foregone, it is appropriate to develop standard definitions and procedures to be used universally for implementation of the salinity control program.
- How can standards and definitions be institutionalized and implemented”?
Answer: By a collaborative process that includes Reclamation staff and staff from the FWS, with input from state wildlife agencies as well. Draft procedures should be circulated to state wildlife points of contact for their review and comment.

2. Authority

The requirement and authority to implement habitat replacement features were first included in the 1984 amendments, Public Law 98-569, to the Salinity Control Act, Public Law 93-320 (Act). The Act, as amended, states:

-In Section 202(a)(1)-(5) that The Secretary shall construct, operate, and maintain the salinity control units . . . consisting of measures to replace incidental fish and wildlife values foregone.

-In Section 202(b)(6) “In implementing the units authorized to be constructed pursuant to subsection (a) of this section, the Secretary shall implement measures to replace incidental fish and wildlife values foregone concurrently with the implementation of a unit's, or a portion of a unit's, related features.

The 1995 amendments, Public Law 104-20, to the Act that created the Basinwide Salinity Control Program states...“Such program shall provide for the mitigation of incidental fish and wildlife values that are lost as a result of the measures and associated works.”

In addition, in the “Report to Congress on the Bureau of Reclamation Basinwide Program”, which was submitted pursuant to Public Law 104-20, the following statements were included:

For the Department of the Interior, the 1984 amendments (P.L. 98-569) modified Interior's program for salinity control in several respects. Principal among these were:

- Requirement for concurrent replacement of incidental fish and wildlife values foregone as salinity control units are constructed

The 1995 amendments (P.L. 104-20) authorize:

- This program shall provide for mitigation of incidental fish and wildlife values that are lost as a result of the measures.

The issues identified in the public review and to be addressed in implementing the program include:

- Meet environmental commitments, including wildlife replacement requirements.

The Act, as amended, requires the replacement of incidental fish and wildlife habitat values foregone by the implementation of salinity control projects in the Basinwide Program. The cost of this mitigation has typically been included in the costs of the salinity control projects used in computing cost effectiveness.

3. General basis and assumptions

As described in the last section, authority is provided by the Act for a habitat replacement program to replace the habitat values foregone or lost as a result of implementation of salinity control improvements. In the original salinity-control program, prior to the development of the Basinwide Program, a large portion of the Reclamation funded irrigation delivery system improvements for salinity control occurred in the Grand Valley, and all habitat replacement was accomplished by Reclamation. About 2,150 acres were acquired in fee title or withdrawn from BLM and extensive habitat improvements were implemented. Long-term operation and maintenance (O&M) of these properties is funded through annual Congressional appropriations, and thus, there is little or no concern about losing these credits over a 50 year project life.

With the advent of the Basinwide Program, a “request for proposals” (now Funding Opportunity Announcement) is used to select salinity control projects from throughout the upper Colorado River Basin (Wyoming, Utah, New Mexico and Colorado). Successful project applicants become responsible for formulation, implementation and long term O&M of their habitat replacement plans. Some proponents utilize Reclamation technical assistance for initial planning and implementation, and other applicants work independently. There is no mechanism to enforce the long-term O&M responsibility.

Some of the basic assumptions of the habitat replacement process are:

- Habitat losses are estimated based on impacts of the salinity control project on existing habitat. If it is clear that the habitat would be lost in the

short term even without the salinity-control project, the projected losses can be adjusted.

- Piping an open ditch is assumed to eliminate 100% of the seepage from that ditch. In this case, all adjacent vegetation providing habitat would be assumed to be lost unless there is some other water source nearby (e.g., an irrigated field, groundwater from another source, or natural seeps and drainages) to maintain a portion of the vegetation. Residual seepage on a lined canal might be assumed to be 5% (initially) and 30% (for concrete later in its life) of the pre-project value which could help maintain some existing habitat.
- Habitat replacement plans are developed with the intent to provide complete and concurrent replacement of losses for the life of the salinity project, typically 50 years for pipelines. Habitat replacement activity will occur at the same time as project construction with the goal of having all initial habitat replacement development completed at the same time as the salinity-control project is completed. If habitat projects do not last the required 50 years, Reclamation operates under the assumption that a revitalized project or new projects will be implemented to complete the 50 year requirement.
- Costs of replacement were to be allocated to project's cost effectiveness value (cost per ton).
- In general, NEPA and ESA compliance are needed to implement salinity-control projects. In some cases, NEPA can be tiered off of previous NEPA documents or categorically excluded from a need for a NEPA compliance document. Reclamation is usually the lead agency for NEPA although the project applicant may provide necessary data and draft reports. It could be possible for another agency to be lead agency if they have jurisdiction or permitting requirements in addition to our funding of the project. The NEPA document must include commitments to complete habitat replacement in accordance with salinity program requirements, even if NEPA analyses determine minor effects to wildlife from the proposed action
- There is a general assumption that wetlands associated with canal and lateral seepage do not meet the definition of jurisdictional wetlands in the 1989 Federal Manual for Identifying and Delineating Jurisdictional Wetlands and the 1987 Corps of Engineers Wetlands Delineation Manual. If wetland sites are classified as jurisdictional under the Clean Water Act, additional permitting and mitigation may be required after consulting with the Corps of Engineers.

In some specific areas, there are environmental commitments contained in the EIS documents that have a bearing on our habitat replacement requirements. These are noted below:

- Grand Valley:
 - EIS requirements:
 - Acquire and develop approximately 2,750 acres of riparian land along the Colorado River. The acreage was based on the original plan in the FEIS. This plan was modified over the years to delete laterals under the GVIC system and segments of main canals, thus reducing total acreage needed.
 - Provide funding for O&M.
 - Underwrite NRCS on-farm impacts.
 - Provide deer escapes in canals, desert watering areas, and avoidance of cottonwood trees.
 - Habitat losses for the Unit were predicted at approximately 411 acres of marsh, 1,531 acres of greasewood, and 298 acres of shrub wetlands, which were found to be generally accurate
 - Actual accomplishments:
 - Five wildlife areas totaling 2,150 acres were acquired in fee title and developed along the Colorado and Gunnison rivers.
 - Habitat development has stressed restoration of riparian vegetation such as cottonwood and willow, development of marsh areas, control of non-native vegetation, seasonal nesting closures, and fencing.
 - Deer escapes were provided in lined sections of canal and desert watering areas were developed.
- Lower Gunnison (Uncompahgre Project area):
 - EIS requirements:
 - Acquire and develop 2,121 acres of land along the Uncompahgre/Gunnison River and provide operation funds.
 - Actual accomplishments:
 - This project was not implemented as planned and displayed in the EIS.
 - Presently the habitat losses of individual projects selected under the Basinwide Program are determined and plans are made to replace only those habitat values lost under individual proposals.
- Price-San Rafael Project Area

- EIS Environmental Commitments specific to habitat replacement, per Attachment V of the Price San Rafael Planning Report/Final EIS, December 1993 as well as responses to public comments received on the EIS:
 - In response to public concerns regarding Federal acquisition of land for habitat replacement, thus removing 'even more' land from the local tax base, commitment #16 states: 'Reclamation would purchase from willing sellers up to 380 acres, with water rights, to be used for development of wetlands lost from off-farm activities...Wetlands would be developed in a ratio corresponding to their losses.'
- *Uinta Basin Project Area, 1986 EIS, Appendix D, p. 130*
 - Habitat replacement commitment to provide 2,000 af/yr of water to BLM to convert 627 acres of desert shrub to irrigated lands and marshes over a period of 20 years in the Pariette Draw. Wetlands development has occurred on the BLM lands, but relation to salinity habitat program is unclear.

3. Definitions

Replacement means the creation or enhancement of habitat to replace habitat values lost as a result of salinity control measures being implemented. This results in no net loss of habitat. An example of this is as follows:

- i. The implementation of a salinity control measure is estimated to cause the loss of 20 habitat units.
- ii. To replace that loss, a replacement property is located where the 20 units can be created by say, building a pond, and/or the value of the existing property can be enhanced by eliminating grazing or eradicating invasive species.
- iii. The replacement property may have had 10 units of value in its pre-existing condition, so once the habitat replacement plan is implemented, the total habitat units on this property would be 30.

Avoidance of impacts means not allowing impacts to occur in the first place. This is the preferred approach to project implementation, when compatible with the overall project purpose. If avoidance can be achieved as regards habitat replacement for salinity control projects, there is no need to undertake habitat replacement for those projects. When impacts to habitat are **unavoidable**, then habitat replacement is required.

Post-construction **preservation** can be an acceptable means of fulfilling the habitat replacement requirements of the salinity control program.

Preservation of existing pre-project habitat means designing and implementing a management plan that assures that the habitat will remain

viable for the life of the project. For example, habitat along a canal which is also located near natural seeps or a natural watershed might be designated for preservation, with monitoring and management intervention (water supply, invasive species control, etc) as needed.

Where avoidance and preservation are not feasible, then acquisition and improvement of replacement property is the required approach.

4. Evaluating habitat impacts and habitat replacement needs

GENERAL

The Salinity Control Act provides for the replacement of incidental fish and wildlife values that are affected by project implementation, and provides that there be no net loss of wildlife habitat. This is not to say that acreage must be the same, but there should be no net loss in total value to wildlife.

Habitat quality will be ascertained using a standardized habitat assessment protocol. This protocol will examine various components of both the habitat impacted in the project area and proposed replacement habitat(s) to form a value of land to wildlife and to assign a Habitat Quality Score. The total wildlife habitat value of an area is determined with the following formula:

$$\begin{aligned} \text{Area (acres) of impacted habitat} \times \text{Habitat Quality Score (HQS) of the impacted} \\ \text{habitat} &= \text{Total Habitat Value Lost (or Total Habitat Units lost)} \\ A \times \text{HQS} &= \text{THV} \end{aligned}$$

The existing total habitat value (THV) of the proposed replacement lands is determined by the same method. Then improvements are planned for replacement lands; the improvement (acres improved X increase in existing HQS) must equal or exceed the total habitat value lost. Thus there will be no net loss of habitat value. The acreage of project impacts and replacement lands will likely be different, varying with the habitat quality scores (HQS) and improvement potential of the replacement lands.

Example:

Five miles of a lateral are to be placed in pipe. There are 5 acres of wetlands/riparian vegetation supported by seepage from the lateral. It is predicted that these 5 acres will be lost when the lateral is placed in pipe.

The Habitat Quality Score of the 5 acres are determined. In this example, the Habitat Quality is 3. Therefore the THV or Habitat Units lost will be 5 acres x 3 = 15

Replacement lands are identified. These lands will have to have the THV improved by 15 in order to have no net loss of value. In this example the

replacement area is 5 acres and has a Habitat Value Score of 4. Therefore the THV of the replacement lands is 20. This needs to be increased to 35. Improvements need to be made to the replacement lands to increase the per acre Habitat Quality Score to 7 for an improvement of 15. This improvement will result in no net loss of habitat value from the project.

If jurisdictional wetlands are present within the proposed project area, Reclamation will coordinate with the Corps of Engineers to coordinate habitat replacement requirements.

HABITAT QUALITY SCORE (HQS)

This protocol has been designed to accurately and effectively assess the habitat quality score of a specified area in a timely and cost effective manner. Eleven criteria have been developed to examine aspects of habitat that are essential for wildlife. The first criterion, riparian or wetland habitat type must have a 'yes' answer in order to proceed to further evaluation. Each of the remaining 10 criteria should then be scored as to what is appropriate or expected for the specific habitat type being evaluated, and some may need to be adapted to fit the specific project area. Evaluators should have an understanding of the ecological community they are evaluating.

For each criterion, the project area will be scored from 1-10, with 10 having the most value to wildlife, 1 having the least value. An example of the scoring system:

Native vs. Nonnative Vegetation Species for both Flora and Fauna.

| 0 | 2 | 4 | 6 | 8 | 10 |
|----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-------------------------------|
| 5 % or less native species | 20% native 80% nonnative | 40% native 60% nonnative | 60% native 40% nonnative | 80% native 20% nonnative | 95% or greater native species |

After all criteria have been evaluated, the total points will be added together. These points will then be correlated to a habitat quality score based on percentage.

Example- There are 10 criteria to be evaluated. The total points earned in the different criteria were 86. The land would have an HQS of 8.6 (raw score of 86 divided by 10)

| Habitat Quality Score (HQS) | Raw Score Total |
|-----------------------------|-----------------|
| 10 | 100 |
| 9.0 to 9.9 | 90-99 |
| 8.0 to 8.9 | 80-89 |
| 7.0 to 7.9 | 70-79 |
| 6.0 to 6.9 | 60-69 |
| 5.0 to 5.9 | 50-59 |
| 4.0 to 4.9 | 40-49 |
| 3.0 to 3.9 | 30-39 |
| 2.0 to 2.9 | 20-29 |
| 1.0 to 1.9 | 10-19 |

EVALUATION CRITERIA

Habitat Type: Examine the habitat type. Riparian and wetland communities serve a broader and more diverse species base as compared to upland communities. Project needs to restore or protect riparian or wetland habitat to be eligible for further consideration.

In evaluating replacement lands, project will restore/protect riparian or wetland habitat: YES NO

If YES, proceed to evaluate remaining 10 criteria. If NO, project will not be considered further.

Vegetative Diversity: Evaluate the composition of readily observable native plant species. Examine if a variety of native plant species are present or if 1 or 2 species dominate with little variation.

| 0 | 3 | 5 | 7 | 10 |
|--------------------|---------------|--------------------|----------------|---------------------|
| Very Low Diversity | Low Diversity | Moderate Diversity | High Diversity | Very High Diversity |

Stratification: Evaluate the canopy coverage of the different height levels of vegetation. It should be taken into account that different communities will have different canopy compositions. Examine if there is there an appropriate mixture of trees, shrubs, and herbaceous species.

| 0 | 2 | 4 | 6 | 8 | 10 |
|----------------------------|---------------------|---|--|--|--|
| More than 2 layers missing | 2 layers are absent | 1 layer is missing, at least 1 of the other layers is not functioning | 1 layer is missing, but others are functioning | All appropriate layers are present, but one is not functioning | All appropriate layers present and functioning |

Native species vs. Nonnative species: Evaluate the composition of native flora and fauna species as compared to nonnative species. What is the relative percentage of each?

| 0 | 2 | 4 | 6 | 8 | 10 |
|----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-------------------------------|
| 5 % or less native species | 20% native 80% nonnative | 40% native 60% nonnative | 60% native 40% nonnative | 80% native 20% nonnative | 95% or greater native species |

Noxious Weeds: Evaluate the presence of noxious weeds. Are noxious weeds present? How abundant are they? If weeds are present then management activities will be needed to control weeds.

| 0 | 2 | 4 | 6 | 8 | 10 |
|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------|-------------------|
| Weeds cover 25% of lands | Weeds cover 20% of lands | Weeds cover 15% of lands | Weeds cover 10% of lands | Weeds cover 5% of lands | Land is weed-free |

Overall Vegetative Condition/ Health: Evaluate the overall health and condition of plant species. Are the plants healthy or stressed? Examine leaf color, leaf size, and percent of dead material, evidence or absence of new growth. Are any diseases or insect infestations present? If disease or infestation is present then a score no higher than 5 may be given.

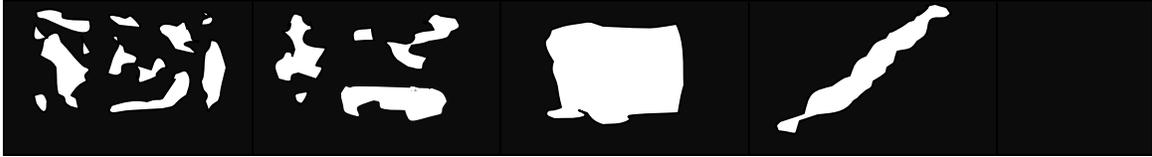
| 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|--|
| 60% of plants are stressed, no disease or infestation | 50% or less of plants are stressed, no disease or infestation | 40% or less of plants are stressed, no disease or infestation | 30% or less of plants are stressed, no disease or infestation | 20% or less of plants are stressed, no disease or infestation | No visible signs of disease/ infestation, 100% of plants healthy |

If disease or infestation is present, additional scoring as follows:

| 0 | 2 | 4 | 5 |
|--|--|--|---|
| 25% of plants are diseased or infested | 15% of plants are diseased or infested | 10% of plants are diseased or infested | 5% or less of plants are diseased or infested |

Interspersion of open water with vegetation: The special arrangement of the Wetland's open water in relation to its vegetation.

| | | | | |
|--------------|-----------------|----------|----------|-----------|
| 10-8 High | 7-4 Moderate | 3 Low | 1 Low | 0 Zero |
|--------------|-----------------|----------|----------|-----------|



Connectivity: Examine the proximity of other wildlife habitat areas. Is the land isolated or are travel corridors present? Is the adjacent property in an established conservation area, or is no protective agreement in place?

| 0 | 3 | 5 | 7 | 10 |
|------------------|--|--|--|---|
| Land is isolated | Adjacent to wildlife habitat with no agreement | Within wildlife habitat property with no agreement | Adjacent to an established conservation area | Within an established conservation area |

Uniqueness or Abundance: Examine the overall value of habitat to wildlife and its abundance or scarcity. Is the land especially unique or valuable to wildlife? Does it provide special or critical habitat? Is this habitat type common or unusual?

| 0 | 2 | 4 | 6 | 8 | 10 |
|--|--|---|---|--|--|
| Exhibits very low wildlife value regardless of abundance or scarcity | Exhibits medium to low value for wildlife and is relatively abundant | Exhibits medium value for wildlife and is relatively abundant | Exhibits medium value for wildlife and is relatively scarce Seasonal use | Highly valuable for wildlife but is relatively scarce or becoming scarce Year Round use by wildlife | Highly valuable for wildlife and is very uncommon Nesting or fawning or calving present |

Water Supply: Examine the water supply for the area. Examine if the water is from a natural flowing stream or river, or dependent on irrigation flows or delivery systems. Examine the nature of the stream- is water present year round or only seasonally? If the habitat is dependent on water from non-natural sources to maintain its HQS, then what are the terms surrounding the water supply? Is an agreement in place?

| 0 | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|----|
|---|---|---|---|---|----|

| | | | | | |
|-----------------|---------------------------|--|---|--|-------------------------------|
| No water supply | Water supply is uncertain | Non-natural flows are seasonal or year round flows are uncertain | Non-natural seasonal flows are guaranteed; Seasonal natural flows are uncertain | Non-natural year round flows are guaranteed or seasonal natural flows guaranteed | Perennial, unregulated stream |
|-----------------|---------------------------|--|---|--|-------------------------------|

Alteration: Examine the evidence of human alteration on the land. Look for roads, mining, railroad tracks, urban and suburban encroachment. The more disturbance that has occurred on the land the lower the score.

| 0 | 2 | 4 | 6 | 8 | 10 |
|---|---------------------------------|---------------------------------|---|---|-------------------------------------|
| 80% or more of land has been heavily developed/ altered | 70% has been developed/ altered | 50% has been developed/ altered | 30% of land has been developed/ altered | 10% or less of project or adjacent land | No alteration/ development observed |

Future Habitat Value: The future habitat value will be taken into consideration. If lands are currently at a low HQS due to current or past management practices, but have the potential for higher habitat quality, and will be managed in a manner to restore the habitat, then the potential of the land will be evaluated. The probable net increase of HQS of the habitat after restoration will be the score used in calculating the THV. A restoration plan, including identifying a managing entity, should be developed to qualify for consideration under this method. The predicted HQS should be supported by tangible evidence such as adjacent unaltered areas or historical references.

If the lands are currently in good condition but are faced with an imminent threat that would notably reduce their value then additional points will be awarded. 1/4 of the total points earned in the criteria evaluation will be added to the score.

Additional Considerations: The following criteria will not be used as “points” in evaluating existing conditions or proposals; however, the criteria will be important for qualitative adjustments and negotiations with wildlife agencies.

- **Operation and Maintenance Requirements:** Evaluate habitat replacement proposals for O&M costs and for likelihood of area being

maintained in the long-run. Is there an opportunity for a state/federal land management agency to manage lands under existing programs?

- **Habitat for Sensitive or Special Value Species:** Existing habitat and replacement habitat should be evaluated for federally or State listed species or their habitat. Also species of special value such as raptors should be considered.
- **Restoration of Missing Habitat:** There is added value to replacement lands that create or restore a community or habitat type that was previously missing.
- **Educational or Social Value:** The site has value to the community as an environmental education site and will be developed to utilize this potential.
- **Wildlife Species:** Based on observations, will replacement lands benefit species that utilized the impacted habitat.

HABITAT REPLACEMENT

The goal of the salinity-control program pursuant to authorizing legislation is to assure no net loss of wildlife values. On the project management level, the goal where replacement is needed (e.g. impacts are unavoidable, and pre-project habitat cannot be reliably preserved) is to develop habitat replacement that is beneficial to wildlife, cost effective, viable and manageable for the life of the project, and meets the intent of the Salinity Control Act. This is accomplished through improvement in function and value of other habitats.

- a. Criteria for habitat replacement for impacts:
 - i. Where habitat replacement is needed, the value of the created habitat must equal or exceed in biological value the habitat being lost as the result of a project.
 - ii. An "Ideal" replacement property is one that:
 1. Is in or near the salinity-control project area so as to provide compensation for directly affected wildlife to the extent possible
 2. Is an in-kind replacement of the particular values lost (usually riparian or wetland but sometimes upland too)
 3. Is contiguous to or connects other areas that have wildlife value, such as adjacent to perennial streams and naturally occurring wetland complexes.
 4. Would have a willing and able manager (e.g. state wildlife agency, volunteer conservation group such as Ducks Unlimited, or a city or county level agency)
 5. Has the most characteristics that might assure viability for 50 years (e.g. location, ownership/easements, level of

management/maintenance needs, fits within agency and public conservation plans and priorities, availability of managing partner at no cost to Reclamation)

b. Procedures and options for applicant's planning and designing habitat replacement projects:

- i. Developmental steps
 1. Develop preliminary and final plans in coordination with Reclamation, FWS and state wildlife agencies.
 2. Identify opportunities for habitat projects closely resembling the Ideal property model described above
 3. Determine total habitat value of lands impacted by proposed action.
 4. Develop plan to provide replacement lands that provide sufficient increase in total habitat value to offset losses.
 5. Include monitoring, adaptive management, and reporting in the plan.

c. Option for Reclamation to implement habitat replacement plans:

There are Pros and Cons as to whether Reclamation should, in the future, allow for the option of accepting responsibility for implementing project-specific habitat replacement for an applicant. We have historically allowed for this option by withholding project funds. In one case, the Provo Office must still come up with habitat replacement and management for 32.43 acres in the Price-San Rafael project area for 9 projects (an average of 3.6 acres per project).

Note that this brief analysis is separate from whether Reclamation should look toward FOAs for habitat-only proposals. If that approach is pursued, then presumably in the future Reclamation's role on habitat could be to facilitate the 'banking' of habitat replacement needs into one of the Reclamation-funded projects.

Below is a quick listing of 'pros'- continuing to allow the pay-Reclamation-to-do-HR option, and 'cons'- requiring the applicant to prepare and submit for approval a HR plan that assures replacement of wildlife values foregone for the life of the project.

| PROS | CONS |
|--|---|
| For small acreage habitat needs, allows for consolidation into larger, contiguous wildlife tracts that would have more long term value and viability | Increases Reclamation's salinity program staff workload and costs |

| | |
|--|--|
| Better assurance of viable habitat replacement for the life of the project | Reclamation is 'not a land management agency'; not necessarily long term guarantee if future budget cuts |
| Increased opportunities to partner with state or Federal land or wildlife agencies to concurrently meet their needs while fulfilling salinity habitat requirements | Not necessarily long term assurance if partnering agency is victim of future budget cuts |
| Better assurance of willing participants in the process | Might be detrimental to desired goal of 'in kind in place' replacement (consolidated wildlife properties might be some distance from area of wildlife habitat loss). |
| Makes it easier on the applicant who is not a wildlife habitat expert | Potential loss of educational opportunity to foster local interest in wildlife conservation |
| Better accountability between Reclamation and Salinity Control Forum on good habitat replacement | Years later we are still on the hook for some projects- and getting them done goes to the end of the line in deference to getting newer projects in place. |

d. Options for locating projects:

With increasing land values, urbanization and small scale salinity projects (when compared to Salinity Control Units, i.e. Grand Valley) being implemented, purchasing properties for development for most habitat replacement projects may not be a realistic option. Partnerships with other agencies can stretch limited funding and accomplish multiple objectives. Listed below are few options to assist in planning habitat replacement projects.

1. Are there federal, state, county or local government properties with proposed habitat projects that need funding for implementation? Examples include: national wildlife refuges, national parks and conservation areas, wilderness study areas, areas of critical environmental concern, state wildlife areas, state parks, county-designated open space areas, and conservation easements. Agencies may agree to provide long-term operation and maintenance if habitat projects fit within their long-range plans and the anticipated O&M costs are limited.
2. Are there properties listed in above without planned habitat enhancement projects that have potential for habitat development or enhancement?
3. Are there lands under federal, state, or local jurisdictions adjacent to properties described above that could be developed

and incorporated by the jurisdiction (i.e. adding adjoining land to a state wildlife area)?

4. Does the applicant own or control lands with potential for habitat replacement? Ideal properties would include those along rivers or streams where sufficient groundwater and/or irrigation is available to support riparian and wetland species. Measures need to be developed to assure that the habitat replacement is maintained for the life of the salinity control project implemented (normally 50 years for piping projects).

e. Habitat replacement plans:

General requirements: The habitat replacement plan should include:

1. Description of proposed salinity control project.
2. Description and quantification of salinity project habitat impacts
3. Description of proposed habitat replacement plan, including development and O&M.
4. Quantification of net increase in habitat value that result from the habitat replacement plan.

Review procedures: Habitat replacement plan will be reviewed by Reclamation and wildlife agencies. Plan will require approval by Reclamation prior to implementation of salinity control activities

6. Role of Fish and Wildlife Service and State & Tribal wildlife agencies

The FWS participates in the Salinity Control Program pursuant to authorities and responsibilities set forth in the Endangered Species Act, Fish and Wildlife Coordination Act, Clean Water Act, National Environmental Policy Act, and the Migratory Bird Treaty Act. These authorities are not always applicable; however, Reclamation believes that voluntary coordination with the FWS on all program habitat replacement projects is appropriate and beneficial.

The Fish and Wildlife Coordination Act (48 stat. 401, as amended; 16 U.S.C. 661 et seq.), (FWCA) provides that “fish and wildlife conservation shall receive equal consideration and be coordinated with other features of water resources development programs... whenever the waters of any stream or other body of water are proposed or authorized to be impounded, diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified for any purpose whatever, including navigation and drainage”. The FWCA applies to activities of greater than 10 acres surface size planned by any department or agency of the United States or by any public or private agency under Federal permit or license. The FWCA further stipulates that such

department or agency first shall consult with the FWS and the state wildlife agency with a view to the conservation of wildlife resources by preventing loss or damage to such resources as well as providing for the development and improvement thereof in connection with such water-resource development. The FWS and the state wildlife management agencies are authorized to conduct investigations and prepare a report with recommendations for wildlife conservation and development, lands to be utilized or acquired for such purposes, the results expected, the damage to wildlife attributed to the project and the measures proposed for mitigating or compensating for these damages. The FWS participates in the Salinity Control Program by providing technical assistance on fish and wildlife resource impact assessment, restoration, and management and acting as liaison with and to state wildlife management agencies. The FWS also provides independent review and oversight of program aspects dealing with fish and wildlife resources, including our assessment of the degree to which fish and wildlife have received due consideration in project planning and incidental fish and wildlife values foregone have been replaced.

Scope of work for FWS pertaining to the basinwide program contains this:

- Shall provide written evaluations or recommendations to Reclamation for the planning, design, and development of habitat replacement plans for Basinwide Program projects throughout the Upper Colorado River basin. Such evaluations or recommendations will be for the purpose of assisting Reclamation in assuring the habitat replacement commitments are met.
- Shall assist in preparing a "Score Sheet" table, in collaboration with Reclamation, showing the habitat replacement needs, i.e. values and/or acres, for each of the Basinwide Program projects and the habitat replacement that has occurred with these projects.

COORDINATION WITH STATE AND TRIBAL WILDLIFE AGENCIES-

Reclamation will provide state or tribal wildlife agencies copies of all wildlife agreements with a request for their review, comments and ultimate approval of the agreement prior to its implementation. The state and tribal wildlife agencies will be encouraged to contact the FWS salinity coordinator to discuss the agreements prior to their final approval.

7. Monitoring requirements

Once a property has been developed for salinity project wildlife replacement, there is typically a period of annual reporting by the applicant to Reclamation, and these reports are shared with FWS and state wildlife agency. Generally, these reports include annual documentation via photos at specific photo points. In addition to the annual reports, Reclamation typically monitors each property at least once a year to ensure that it is performing as intended and attaining or enhancing wildlife values.

- Site visits are conducted at least once a year to verify condition of property and allow for follow-up with applicant (or property manager if different) on any issues/concerns that need to be addressed.
- When applicable set up photo points of area of interest (Example: pre and post pictures of grazing).
- When possible and appropriate, set up 24 hour wildlife monitoring cameras to better understand wildlife movement in the area and have a better idea of the type of wildlife that use the area.
- Coordination with property manager occurs as needed throughout the year to ensure management in accordance with approved plan or if necessary, revise plan in coordination with FWS and DWR as conditions change.
- Within the 5 year period, Reclamation will direct applicants to repair any determined deficiencies.

8. Documentation requirements for habitat replacement plans

1. Basic salinity control project information: Project name, applicant name, location, habitat replacement requirement.
2. Approved habitat replacement plan/habitat management plan, including monitoring plan (or, a summary of approved plan).
3. Monitoring reports

9. Reporting requirements

Below is a proposed format for the report which would be made available periodically to the Work Group and Forum.

Projects constructed under Basinwide Program

Habitat Replacement Scoresheet

Area: Lower Gunnison

| Project | Grant recipient | Construction dates | Habitat impacts | | Habitat Replacement | | |
|-----------------------------|-----------------|--------------------|-----------------|---------------|---------------------|----------------|----------------|
| | | | Acreage | Habitat Units | Location | Units replaced | Date completed |
| Phase 1 East Side Laterals | UVWUA | 1998-2000 | | | Escalante SWA | | 200? |
| Phase 2 East Side Laterals | UVWUA | 2004-2009 | | | Escalante SWA | | Nov-06 |
| Phase 3 East Side Laterals | UVWUA | 2007-2011? | | | Escalante SWA | 0 | incomplete |
| Phase 4 East Side Laterals | UVWUA | 2008-2012? | | | Escalante SWA | 0 | incomplete |
| Phase 6A East Side Laterals | UVWUA | 2010-2011? | | | Escalante SWA | 0 | incomplete |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Area: Grand Valley

| Project | Grant recipient | Construction dates | Habitat impacts | | Habitat Replacement | | |
|------------------------|-----------------|--------------------|-----------------|---------------|------------------------|----------------|----------------|
| | | | Acreage | Habitat Units | Location | Units replaced | Date completed |
| GVIC Canal Lining 2008 | GVIC | 2008-2011? | | | CO River Wildlife Area | | |
| | | | | | | | |

FWS input on the Score sheet:

1. may need a habitat replacement acreage category if that is used instead of or in addition to habitat value
2. include the historic Grand Valley and Dolores Salinity Projects into this table. Include NRCS update.

10. Potential for wildlife only FOA and other habitat replacement options

The Team briefly reviewed the concept of a “wildlife only FOA”. A copy of the draft proposal is included as Appendix A.

There would be a very significant number of details to discuss and planning that would need to occur prior to accepting and implementing this option. The team believed this to be beyond the scope of this current exercise. However, it is a potentially advantageous, viable and desirable option, and the team, including the Program Manager, recommends it be more thoroughly investigated and discussed in a future effort. This “wildlife only FOA” might be a good option for the accomplishing the incomplete PSR area habitat replacement needs or other places where habitat projects have failed or not met expectations.

11. Team recommendations for continuing program improvement

- a. High priority
 - i. Implement all incomplete/deficient habitat replacement projects as soon as possible (i.e. in Price San Rafael).
 - ii. Using this document, create a ‘Procedures’ manual to be used internally as well as made available to applicants.
- b. Lower priority
 - i. Investigate “Wildlife-only” FOA.

12. Other issues for the HRT

- a. What’s the appropriate level of detail for the HR impacts in a FOA application? How does the Application Review Committee tell if it’s based on sound assumptions? Based on discussions within the team, it seems that minimum requirements would call for a tabulation of habitat values lost, a habitat replacement proposal to result in no net loss of habitat value, and a plan to cover long-term management of the habitat replacement. The Application Review Committee could utilize HRT members to assist in evaluations.
- b. Can we buy property and let others improve, each taking some credit? – For example, a moderate-sized property that could support several habitat replacement projects and be managed by state agency? This could be a practical approach to habitat replacement and could require a habitat only FOA (see Attachment A)
- c. How do we handle catastrophic events, like fires and floods that impact the HR project? In theory, habitat replacement projects have a life span similar to the salinity projects. Future fires and floods should be considered in planning for habitat replacement.

- d. There is some concern on addressing habitat replacement projects that may have been approved by FWS in the past but later personnel may not support the approval. Reclamation believes that if a project is approved, including coordination with wildlife agencies, the approval process does not need to be revisited unless habitat replacement goals are clearly not met.
- e. In the future, will Reclamation accept the responsibility for implementing habitat replacement plans on behalf of an applicant? Reclamation would withhold funds from the award to do this? In the last FOA, Reclamation decided not to allow this. This situation has occurred in the past when Provo accepted responsibility for some Price-San Rafael projects. However, as was previously noted, they were never implemented, and thus there is an outstanding liability which stills needs to be addressed. Here are some considerations:
- These could be implemented under the "wildlife-only" FOA concept that has been proposed.
 - If it's a very small salinity project with limited habitat impacts, it doesn't make a lot of sense to have an entity do an individual HRP; a collection of these little ones will be hard to manage and for us to keep track of. It might be more efficient to combine the small ones somehow.
 - If Reclamation accepts responsibility, it can be assumed that Reclamation takes all the risk if it turns out there is insufficient funding to do what needs done. With the applicant taking responsibility, they have to find a way to get it done with their set amount of project funding.
 - Also, does this mean that Reclamation may also be responsible for the long term O&M, which could be a significant amount, unless we find a willing partner to take on the O&M?
 - It seems we are going to have lots of HR projects all over the countryside after 25 or 50 years of the Basinwide Program. Could this be an average of 4 projects/yr X 50 years = 200 projects? How and who are going to keep track of all these projects?
 - Can Reclamations' existing staff handle this large a load?
 - Do we assume Reclamation is responsible for replacement, given a good chance some of these projects will not last 50 years on their own?
 - One option is have applicants send in regular reports. Can Reclamation expect them to do this for 50 years? Reclamation has successfully asked for and received reports for 3-5 years, beyond that might be pushing it. A reporting requirement would presumably only apply to non-government projects? If the habitat replacement requirement is being fulfilled on state, federal, or even county land and there is a reliable land manager with an institutional interest in successful habitat, a reporting requirement would be necessary.

Appendix A

PROPOSAL FOR A WILDLIFE-ONLY FOA

Proposal: Conduct an FOA process to select and fund Basinwide Program wildlife replacement projects

Background: This concept is based on the likelihood that with such a FOA process, Reclamation would be able to:

- obtain better quality and more successful wildlife projects,
- get a bigger bang for the buck,
- suffer fewer headaches, and
- Affiliate with partners, who are providing some of their own resources and have a strong interest in the long term success of any joint projects.

This concept could significantly reduce concerns about the long term performance of current wildlife replacement efforts under the Basinwide Program.

Instead of the current practice of requiring individual salinity project sponsors to develop and implement habitat replacement plans, a FOA process would be developed to implement required habitat replacement in a more cost effective and more beneficial manner for wildlife. This competitive program would be open to interested parties that could demonstrate a quality product, reasonable costs, owner commitment, and long term, guaranteed performance.

Advantages:

- Applicants will be strongly interested in habitat not someone just needing a check-off on their project implementation list.
- Reduces burden on irrigation company/applicant constructing a salinity-control project
- Removes need to consider habitat replacement in the evaluation of salinity-control proposals during a Basinwide Program FOA process. At this stage, there is typically inadequate information to put together and cost out a reasonable plan; therefore, many applicants assume costs that are either too high or too low.
- Open to a wide variety of interests
- Broadens the range of potential partners possibly bringing together many resources to accomplish regionally significant habitat projects and improvements.
- Provides ability to select projects and lands with the highest potential wildlife value, not just something (possibly of lower value) fulfilling a requirement
- Applicants are more likely to be interested in long-term O&M of the project
- Larger projects with more resources may be more valuable to wildlife than a number of small projects
- Could obtain more assurances the project would survive in the long term

- Promotes competition and hopefully better projects
- If using the percentage method of allocation – may actually provide more funding to directly benefit wildlife; could move away from having to place values on different types of habitat.
- Reduces Reclamation monitoring requirements if the wildlife improvements are done at a few sites instead of many remotely located sites.
- O&M costs may be less on a few sites than many sites.
- Could be designed to accommodate NRCS needs.

Disadvantages:

- Conducting a new FOA process may be tedious and time consuming.
- May miss opportunities to utilize lands donated by irrigation companies

Other considerations:

- What happens if an insufficient number of reasonable proposals are received to spend the allocated funding?
- Process might have to be structured to provide for projects in the vicinity of the salinity-control project impacts

Primary selling points for the Basinwide Program:

- Better quality projects fulfilling the requirements of the Act
- Can likely shift long-term O&M concerns to project sponsor
- Saves Reclamation time and money quantifying habitat losses & anticipated gains on replacement properties, coordinating projects, monitoring, etc.
- Simplifies FOA process for applicant and Reclamation

ATTACHMENT D

Endangered Species Act Compliance Documents

(To be attached to Final EA)

ATTACHMENT E

Cultural Resources Compliance Documents
(To be attached to Final EA)

ATTACHMENT F
Habitat Replacement Plan

**WETLANDS HABITAT LICENSE AGREEMENT FOR
CEDAR CANON IRON SPRINGS DITCH AND RESERVOIR COMPANY**

This agreement, between **Cedar Canon Iron Springs Ditch And Reservoir Company**, a Colorado non-profit mutual ditch corporation (herein "licensee") and Donald R. Hart and Jane M. Hart (hereafter "Landowner" is to provide for wetlands creation and preservation on Landowner's lands. For that purpose, the parties agree as follows:

1. Landowner owns approximately 1436 acres located at: S: 3 T: 50 R: 6 LOT 4, SW1/4 NW1/4 S: 4 T: 50 R: 6 LOT 4, S1/2 NW1/4, N1/2 SW1/4, N1/2 SE1/4, SE1/4 NE1/4 S: 5 T: 50 R: 6 S2NE, NESE, LOTS 1 & 2, E2SE4NW4; LOT 3 EXCEPT THE W2SW4 & SE4SW4 OF SAID LOT 3; LOT 4 EXCEPT THAT PART OF LOT 4 DESC BY M/B #836081 S: 29 T: 51 R: 6 SW1/4SW1/4 S: 30 T: 51 R: 6 E1/2 SE1/4 SE1/4 S: 31 T: 51 R: 6 E1/2 NE1/4 NE1/4, PART OF THE SE1/4 SE1/4 DESCRIBED AS FOLLOWS: BEGINNING AT THE SOUTHEAST CORNER OF SECTION 31; THENCE NORTH 1328.5 FEET; THENCE NORTH 88°12'00" WEST, 721.0 FEET; THENCE SOUTH 3°24'00" EAST, 512 FEET; THENCE SOUTH 67°38'00" WEST, 357.0 FEET; THENCE SOUTH 17°00'00" EAST, 735.0 FEET; THENCE NORTH 89°50'00" EAST, 805.5 FEET TO PLACE OF BEGINNING; ALSO A TRACT OF LAND LOCATED IN THE SE1/4 SE1/4 DESCRIBED AS BEGINNING AT A POINT 721.0 FEET WEST OF THE NORTHEAST CORNER OF SE1/4 SE1/4 ON THE NORTH LINE OF SAID SE1/4 SE1/4; THENCE SOUTH 3°24'00" EAST, 512.0 FEET; THENCE SOUTH 67°39'00" WEST, 227.0 FEET; THENCE NORTH 16°53'00" WEST, 621.2 FEET TO SAID QUARTER SECTION LINE; THENCE EAST, 360.0 FEET TO PLACE OF BEGINNING S: 32 T: 51 R: 6 SE1/4, S1/2 NE1/4, SE1/4 NW1/4, E1/2 SW1/4, SW1/4 SW1/4, NW1/4 NW1/4, NW1/4 SW1/4 NW1/4, E1/2 SW1/4 NW1/4, NE1/4 NW1/4 SW1/4, S1/2 NW1/4 SW1/4 AND ALL THAT PART OF THE SW1/4 SW1/4 NW1/4 AND NW1/4 NW1/4 SW1/4 LYING EAST OR SOUTH OF CLEARFORK ROAD S: 33 T: 51 R: 6 S2NW, N1/2SW1/4, NW1/4SE1/4, LESS A TRACT OF LAND IN SEC 33-51-6 DESC AS BEG AT THE NW COR OF THE SENW OF SAID SEC 33; TH SELY TO A POINT ONE FOOT SW OF THE SE COR OF THE SENW; TH SELY TO THE SE COR OF THE NWSE OF SEC 33; TH NLY ON THE E SIDE OF THE NWSE TO ITS NE COR; TH WLY ALONG THE N SIDE OF THE NWSE TO ITS NW COR; TH NLY ALONG THE E SIDE OF THE SENW TO ITS NE COR; TH WLY ALONG THE N SIDE OF THE SENW TO THE POB.

2. Licensee, at its sole cost and expense, proposes to construct and maintain fish and wildlife habitat enhancement on approximately 13.72 acres of this parcel. The locations are described and shown on the map attached hereto as Attachment "A".

3. Landowner hereby grant to Licensee, upon the terms hereinafter provided, a license for the following purposes and in the location described on Attachment "B" :

A. Purpose: To construct, operate, and maintain fish and wildlife habitat enhancement, as more particularly described on Attachment "C" and Attachment "D" attached hereto.

B. Period: 50 years until (December 31, 2065).

C. Construction and Operation: The Licensee shall perform all work under this license agreement in accordance with the plans shown on Attachment "D", or approved revisions hereof, and in a manner satisfactory to Landowner. Licensee is responsible for obtaining all permits, licenses, authorizations, and consents, either from other government entities or private individuals that are necessary and/or required for this activity prior to construction.

D. Licensee shall exercise care to preserve the natural landscape and shall conduct its construction operations so as to prevent any unnecessary destruction, scarring, or defacing of the works, all trees, native shrubbery, and vegetation shall be preserved and shall be protected from damage which may be caused by Licensee's construction operations and equipment. Movement of crews and equipment within the rights-of-way and over routes provided for access to work shall be performed in a manner to prevent damage to grazing land, crops, or property.

E. Upon completion of the work, the construction site shall be smoothed and graded in a manner to conform to the natural topography of the landscape and shall be repaired, replanted, and reseeded.

F. For the fee stated in paragraph 5(A), below Licensee will be responsible for any and all operation and maintenance activities associated with the constructed wildlife habitat and wetland improvements and enhancements. Licensee shall have the right to inspect the premises to assure that the habitat is being adequately maintained. Licensee will be responsible for any out of pocket expenses related to repair and maintenance of the habitat enhancement, except for damages caused by Landowner activities.

4. No more than three weeks of livestock grazing will be allowed on the habitat improvement site each year and this may be conducted during the months of April and May.

5. For and in consideration of the license agreement herein granted, Licensee agrees to pay Landowner the following amounts:

A. \$150.00 per year for the first five years for weed control on project site, on or before March 31 each year. This amount may be waived by Landowner if no paid labor or herbicide is required for the normal operation and maintenance of the habitat enhancement.

6. RIGHTS RESERVED

A. This license agreement and all rights hereunder shall be held by the Licensee at all times subject to the rights of the Landowner. Jurisdiction and supervision by Landowner over the concerned lands are not surrendered or subordinated by issuance of this license agreement.

B. Landowner reserves the right to issue additional licenses, right-of-way, or permits for compatible uses of the lands involved in this license agreement.

C. There is also reserved the right of Landowner at all proper times and places freely to have ingress to, passage over, and egress from all of the licensed lands for the purpose of exercising, enforcing, and protecting the rights reserved herein.

7. HOLD HARMLESS

A. Landowner does not assume any liability resulting from the granting of this license agreement or the exercise thereof.

B. Licensee hereby agrees to indemnify and hold harmless Landowner from any loss or damage and from any liability on account of personal injury, property damage, or claims for personal injury or death arising out of the Licensee's activities under this license agreement.

C. Licensee hereby releases Landowner from liability for any and all loss or damage of every description or kind whatsoever, which may result to the Licensee from the construction, operation, and maintenance of wetlands upon Landowner's lands, provided that nothing in this license agreement shall be construed as releasing the Landowner from liability for their own actions.

8. ASSIGNMENT OR TRANSFER

This license agreement shall not be assigned or transferred by the Licensee without the prior written consent of Landowner.

9. SUCCESSORS IN INTEREST OBLIGATED

This license agreement shall inure to the benefit of and be binding upon the successors and assigns of the parties hereto.

10. RECORDED NOTICE

This agreement will be recorded in the Montrose County Real Estate records.

Executed this ___ day of _____, 2015.

By _____
Donald R. Hart

President of Cedar Canon Iron
Springs Ditch And Reservoir Company

State of Colorado
County of _____
The foregoing instrument was acknowledged before me
this _____ day, of _____, 2015.

Name Title or Position

(Notary's official signature)

(Commission Expiration)

Notary Seal

By _____
Donald R. Hart

Landowner

State of Colorado
County of _____
This foregoing instrument was acknowledged before me
this _____ day, of _____, 2015.

Name Title or Position

(Notary's official signature)

Commission Expiration)

Notary Seal

By _____
Jane M. Hart

Landowner

State of Colorado
County of _____
This foregoing instrument was acknowledged before me
this _____ day, of _____, 2015.

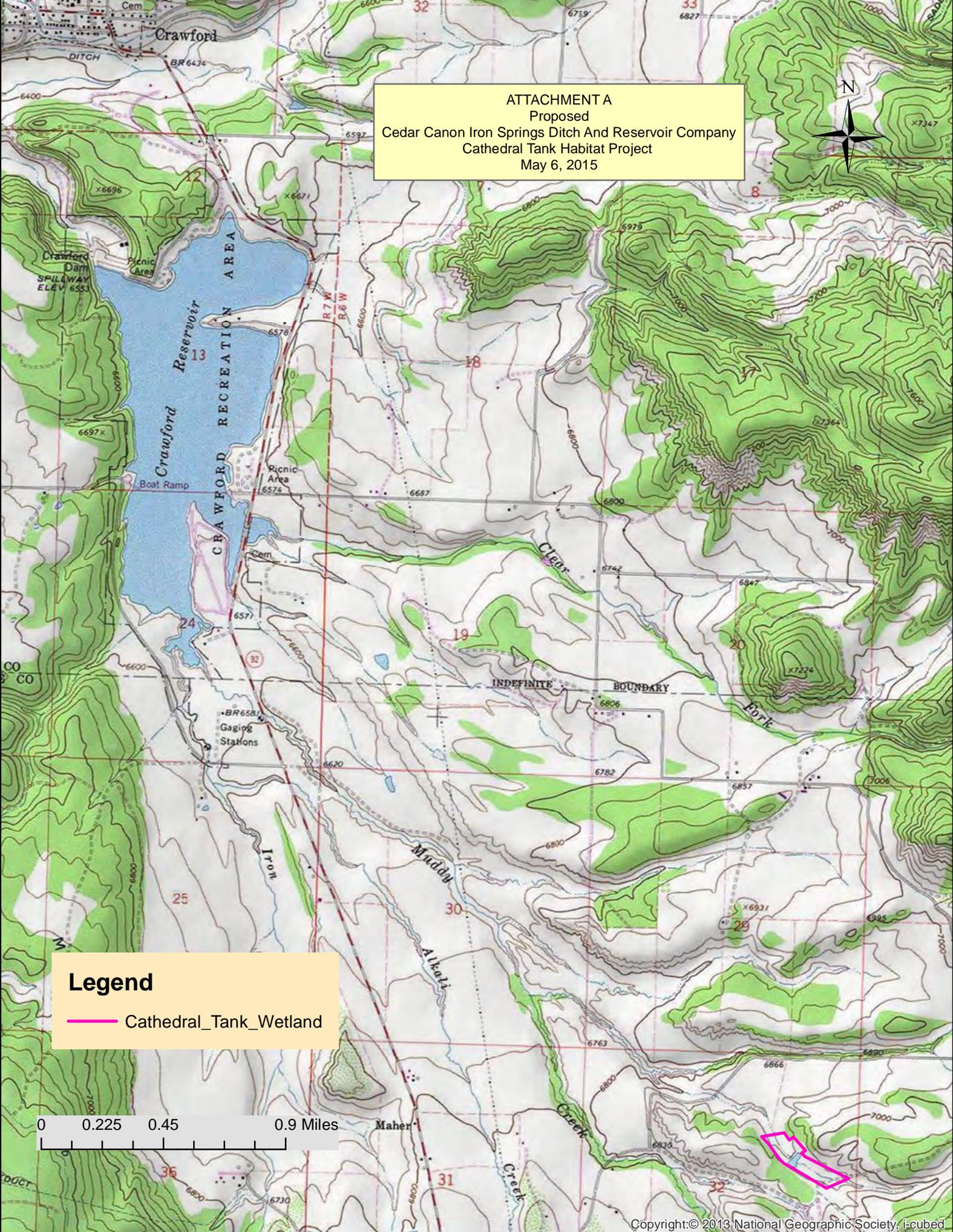
Name Title or Position

(Notary's official signature)

Commission Expiration)

Notary Seal

ATTACHMENT A
Proposed
Cedar Canon Iron Springs Ditch And Reservoir Company
Cathedral Tank Habitat Project
May 6, 2015



Legend

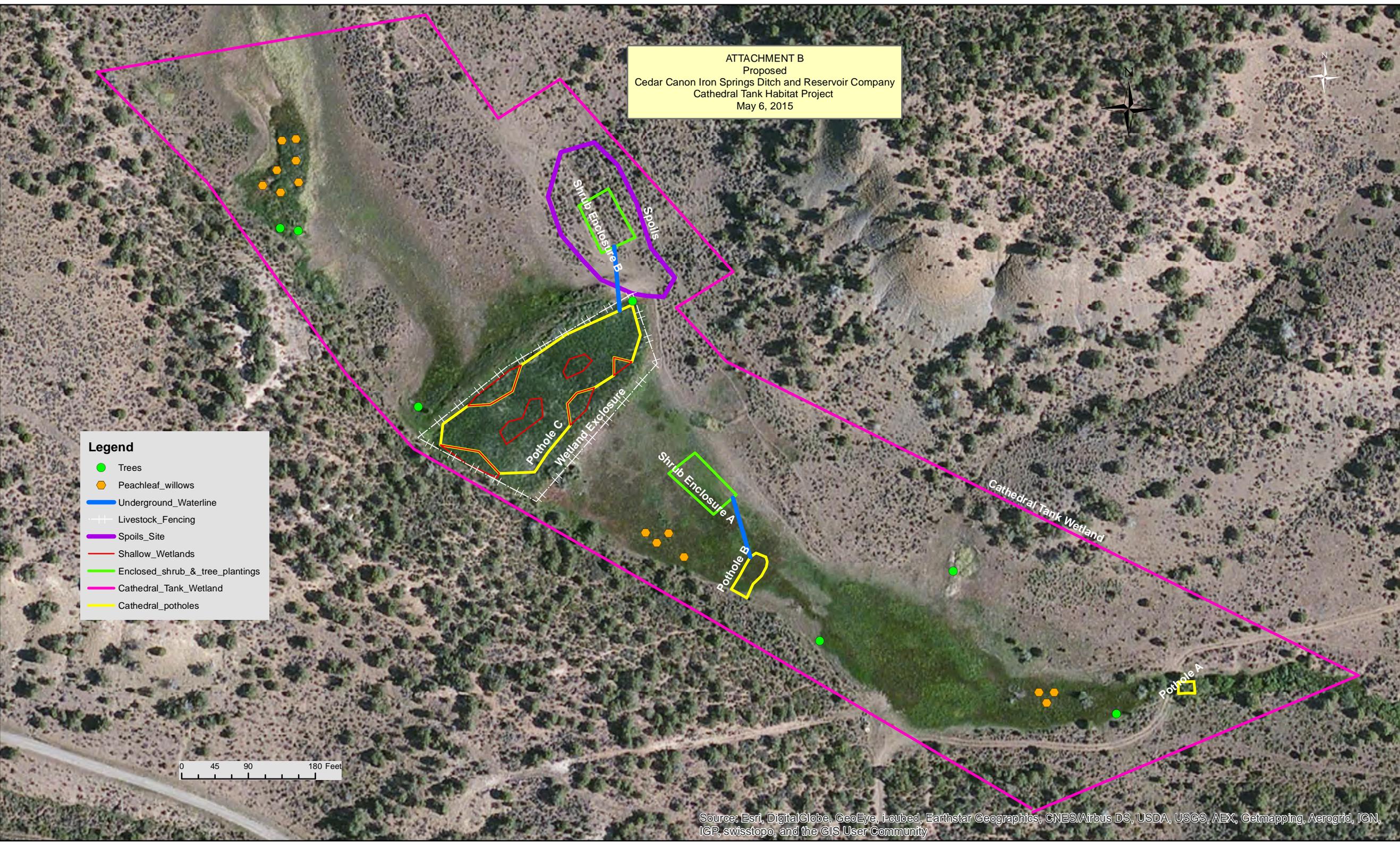
— Cathedral_Tank_Wetland



ATTACHMENT B
 Proposed
 Cedar Canon Iron Springs Ditch and Reservoir Company
 Cathedral Tank Habitat Project
 May 6, 2015



- Legend**
- Trees
 - ⬡ Peachleaf willows
 - Underground Waterline
 - + Livestock Fencing
 - Spoils Site
 - Shallow Wetlands
 - Enclosed shrub & tree plantings
 - Cathedral Tank Wetland
 - Cathedral potholes



Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, ICP, swisstopo, and the GIS User Community

ATTACHMENT C

May 6, 2015 Cedar Canon Iron Springs Ditch and Reservoir Company

Habitat Quality Scoring

Proposed Cathedral Tank Habitat Project

| Habitat Site | H 1 | | 100% | | 100% | | 100% | | 100% | | 100% | | 100% | | 100% | |
|-------------------------------------|-------------------------|----------|-------------|----------|-------------|----------|-------------|----------|-------------|----------|-------------|----------|-------------|----------|-------------|--|
| | Mapped Acres/Adjustment | Before | After | |
| Vegetation Diversity | 4 | 6 | | | | | | | | | | | | | | |
| Stratification | 8 | 10 | | | | | | | | | | | | | | |
| Native vs. Non-Native species | 8 | 9 | | | | | | | | | | | | | | |
| Noxious Weeds | 6 | 9 | | | | | | | | | | | | | | |
| Overall Vegetative Condition | 10 | 10 | | | | | | | | | | | | | | |
| Disease Additional scoring | 0 | 0 | | | | | | | | | | | | | | |
| Interspersion of open water | 1 | 7 | | | | | | | | | | | | | | |
| Connectivity | 7 | 7 | | | | | | | | | | | | | | |
| Uniqueness or Abundance | 4 | 7 | | | | | | | | | | | | | | |
| Water Supply | 6 | 6 | | | | | | | | | | | | | | |
| Alteration | 9 | 9 | | | | | | | | | | | | | | |
| Raw Scores | 63 | 80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Habitat Quality Score (HQS) | 6.3 | 8 | 0 | 0 | 0 | |
| Habitat Score Difference | 1.70 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | | 0.00 | |
| Habitat Credits Gained Per Area | 23.32 | | 0.00 | |
| Total Habitat Credits Gained | 23.32 | | | | | | | | | | | | | | | |

Total Habitat Credits Needed = 15.66

Habitat Credits Available For Future Projects = 7.66

ATTACHMENT D

Proposed Cedar Canon Iron Springs Ditch and Reservoir Company Cathedral Tank Habitat Project

Written by Michael Zeman
Wildlife and Natural Resource Concepts & Solutions, LLC
May 6, 2015

The Cedar Canon Iron Springs Ditch and Reservoir Company, in cooperation with the Bureau of Reclamation, have proposed a piping project for the Cedar Canon Iron Springs Ditch (also known as Cattleman's Ditch). The project will replace approximately 5.6 miles of the open ditch with underground pipe. An additional 4 miles of underground pipe will be constructed outside the existing ditch.

The elevation of the project site is approximately 7200 feet and is located about 6 miles northeast of Crawford, Colorado (See Attachment A). Cedar Canon Iron Springs Ditch flows along and across mostly irrigated farmlands and pinion-juniper covered foothills. The project will destroy wetland habitat along many sections of the ditch during the construction phase and also dry up other areas once the open ditch is put into pipe and backfilled. Disturbed areas will be reseeded, and invasive weeds treated as necessary. The preferred version of the piping plan includes abandoning several segments of the ditch in some very established and self-sufficient riparian areas, instead of backfilling them. In this plan, it is estimated that 15.66 habitat credits* will be lost in the piping of the ditch. If it is decided that all the existing ditch needs to be backfilled, the habitat loss goes up to 20.14 habitat credits. The habitat project currently designed should produce approximately 23.32 habitat credits.

Cedar Canon Iron Springs Ditch and Reservoir Company plans to offset habitat losses from the piping project by building a habitat project on the Hart Ranch, which is located on the lower end of the ditch. The project area is on a portion of the ranch that is held in a conservation easement and administered by the Colorado Cattlemen's Agricultural Land Trust. The site is located in a drainage that is below the Cathedral Water System Tank and is approximately 13.72 acres in size (See Attachment B). The project area receives domestic overflow water from Cathedral Domestic Water System the majority of the year. Excess water (approximately 10 gallons/minute) flows into the drainage above the project area. The water delivered to the member users is usually less than what is produced by the springs feeding the tank, so water flows to the wetland site most of the time.

The proposed habitat improvement project would include: excavating material from an existing wetland that has become a monoculture of cattails; digging two additional potholes; implementing a weed management program; and planting more native trees and shrubs to create a larger variety of vegetative and structural diversity. The biggest pothole cleaned out (Pothole C) will be approximately 0.59 acres in size and will be irregular in shape. Portions of the existing pond bottom will be left in place to create shallow water wetlands, and the rest will be excavated out to a depth of approximately six feet, with 2:1 sloped banks. Materials removed during excavation would be moved to a dry land area to the northwest corner of Pothole C. This area would be leveled out and reclaimed with upland shrub species

(such as antelope bitterbrush, serviceberry, mountain mahogany) along with a mixture of grasses and forbs. This area should be protected from wildlife and livestock while the vegetation is getting established by building a 8' high game damage enclosure (approximately 48' X 72' in size). Pothole C will be completely enclosed with a four strand, wildlife friendly, fence to keep livestock from disturbing it.

Pothole B's dimensions would be roughly 60' long X 24' wide and 4' to 6' feet deep (with 2:1 slopes around the edges). Pothole A will be smaller but deeper (roughly 15' wide X 21' long X 8' deep) and will act as a settling basin. These potholes will help provide a diversity of habitat for birds, mammals, and amphibians. Excavated materials from the smaller potholes will be hauled to the upland spoil site near Pothole A. Disturbed areas along the banks would be seeded with a mixture of grasses and forbs to help keep invasive weed species from taking over. There are several existing wetland plant species (sedges, bulrush, and willow) that should benefit from the additional water and improved wetland site.

Another shrub enclosure will be built between Potholes A & B and will be approximately 40' long X 20' wide X 8' tall. Species placed in it would probably include golden currant, chokecherry, native plum, buffaloberry, and sumac. Both shrub planting areas (here and on the excavated material from the pond) should be prepared by killing weeds and grasses within the enclosures with herbicide. An herbicide like Roundup would work well. Weed barrier material should be placed around the new shrub plantings, along with plastic tree guards. The weed barrier will help the shrubs by reducing the competition for soil nutrients by weeds and grasses. The tree guards will help reduce damage to the plants by rodents and small mammals. Underground flow control structures will be installed in Potholes B & C and connected to waterlines running to the shrub enclosures. These additions will facilitate getting water to the new plantings and aid in the establishment.

Additional trees will be planted outside the enclosures could include narrowleaf cottonwoods, thinleaf alders, or hackberry. They should be at least 6' to 10' in height and should be protected by fencing them in small enclosures made with woven wire and steel t-posts. Peachtree willows will be planted in several wetted areas and should help provide more diversity and cover for wildlife. These should be protected with plastic tree guards.

The current grazing management practice for the area is to keep livestock on it for less than three weeks of the year, sometime during April and May. This grazing could help reduce the amount of dead plant material that can sometimes choke out wetlands and should have minimal impact on the new trees and shrubs.

The habitat site contains a few invasive weeds species such as common cocklebur, Canada thistle, and houndstongue. A weed management plan needs to be developed to control these unwanted species, and it should meet state and county weed control guideline.

A series of six photo points will be set up, and photographs taken on a regular basis to help monitor the project and vegetative response to treatment. If there is a loss of 50% or more of the new trees and shrubs, replacements will be replanted. Photographs will be taken every year during the first five years of the project and every three years after that.

Cedar Canon Iron Springs Ditch and Reservoir Company will be responsible for meeting the habitat goals and maintaining the habitat area for the expected life of the piping project (50 years).

Habitat enhanced by the project would benefit many types of wildlife including waterfowl, shorebirds, turkeys, amphibians, songbirds, bats, and larger mammals. This habitat improvement project will create approximately 23.33 credits. These credits meet the required habitat replacement requirements for the Cedar Canon Iron Springs Ditch and Reservoir Piping Project (15.66) and provide an additional 7.66 habitat credits for future projects.

* Calculations were made using criteria set forth in the *Basinwide Salinity Control Program: Procedures for Habitat Replacement* - (A manual developed by the Bureau of Reclamation and U.S. Fish & Wildlife Service).

HABITAT PLANTING LIST
FOR
CATHEDRAL TANK HABITAT PROJECT
MAY 6, 2015

Suggested plantings but can be modified.

(6-10) Larger trees at least 6' to 10' tall. Available at local nurseries.
Species could include: narrowleaf cottonwood, thinleaf alder, or hackberry.
Planted near water but not in saturated ground. Protected with woven/welded wire & steel t-posts.

(30) Peachleaf willow trees - Available from Colorado State Forest Service Nursery.
Large Tubes - Sold in boxes of 30 (6" min. height)
2015 Price was \$2.53/seedling or \$76.00/lot
Plant in wetted area and protect with plastic tree guards.

Shrubs for Upland Shrub Enclosure - Available from Colorado State Forest Service Nursery.
Large Tubes - Sold in boxes of 30 (6" min. height)
(30) Large Tubes Antelope Bitterbrush - \$76.00/lot
(30) Large Tubes Serviceberry - \$76.00/lot
(30) Large Tubes Mountain Mahogany \$76.00/lot
Site should be leveled and any existing grasses or weeds sprayed with Roundup.
Shrubs should be planted in rows with 4' spacing between plants. This will provide 7 or 8 rows with 12 or 13 shrubs/row in an enclosure that is 48' X 72' in size. The size can be modified for each site. All shrubs should be protected with plastic tree guards to help keep rodents and small mammals from eating the plants. Weed barrier should be placed around all shrubs to help keep the weeds and grass down. A drip system might be considered for watering or marking the plot so it could be irrigated with water from the pothole.

Shrubs for Enclosure between Pothole B and C - Available from Colorado State Forest Service Nursery.
All Bare Root Stock sold in lots of 25 trees/shrubs and are a minimum of 10" in height.
(25) Bare Root Stock - Chokecherry \$26/lot
(25) Bare Root Stock - Native Plum \$26/lot
(25) Bare Root Stock - Golden Currant \$26/lot
(25) Bare Root Stock - Sumac (Skunkbush) \$26/lot
These plants require more water and are less drought tolerant. Site should be leveled and any existing grasses or weeds sprayed with Roundup. Shrubs should be planted in rows with 4' spacing between plants. This will provide 7 or 8 rows with 12 or 13 shrubs/row in an enclosure that is 48' X 72' in size. The size can be modified for each site. All shrubs should be protected with plastic tree guards to help keep rodents and small mammals from eating the plants. Weed barrier should be placed around all shrubs to help keep the weeds and grass down. A drip system might be considered for watering or marking the plot so it could be irrigated with water from the pothole.

ATTACHMENT G

Montrose County Weed Mitigation Department

Weed Mitigation Plan

April 18, 2011

Montrose County
Weed Mitigation Department

Weed Management Plan

4-18-2011

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Section I: Introduction

1.1 Documents

1. § 35-4 Pest Control
2. § 35-4.5 Pest Control Compact
3. § 35-5 Pest Control Districts
4. § 35-5.5 Colorado Noxious Weed Act
5. § 35-10 Pesticide Applicators Act
6. 8 CCR 1203-1 Administration and Enforcement of the Pesticide Act
7. 8 CCR 1203-2 Rules and Regulations Pertaining to the Administration and Enforcement of the Pesticide Applicators Act
8. 8 CCR 1203-7 Rules and Regulations Pertaining to the procedure for establishing pest control district and for the control of Grasshoppers, Mormon Crickets, or Range Caterpillars
9. 8 CCR 1203-19 RECODIFIED Administration and Enforcement of the Colorado Noxious Weed Act—see 1206-2
10. 8 CCR 1206-2 Rules Pertaining to the Administration and Enforcement of the Colorado Noxious Weed Act

1.2 Introductory Statements

The Montrose County Weed Management Plan was developed and adopted pursuant to the authority of The Colorado Noxious Weed Act § 35-5.5-105 for all unincorporated territory in Montrose County and incorporates all the requirements and duties imposed by Article 5.5 of Title 35 of the Colorado Revised Statutes.

The purpose of the Montrose County Weed Management Plan is to inform the public about the role and practices of the Montrose County Weed Mitigation Department and to serve as a reference to landowners/users combating noxious species. As the department spends a significant amount of time and effort in combating noxious weeds, it is our hope that landowners and land users will use the document to implement land use practices that both support the efforts of the department and capitalize on the services that we provide. Though the management plan has been written to reflect the goals and management strategies implemented by the department, the evolution of management strategies, targeted species etc., may not be reflected in this document. The document will be revised periodically to reflect the changes implemented by the Montrose County Weed Mitigation Department, Local, State and Federal governments.

1.3 Mission Statement

In consideration of the encroachment of noxious weeds into Montrose County, the Montrose County Weed Mitigation Department (hereinafter referred to as the “Weed Mitigation Department” or “department”) becomes an agent in the preservation of productivity and general wellbeing of unincorporated lands within the county. To preserve our landscape and natural resources from the degradation associated with the spread of noxious weeds, our goals become the eradication of isolated or young weed

populations, management of well established populations, and the awareness, education and instruction of landowners and recreational land-users concerned with the impacts of noxious weeds.

With the success or failure of a countywide weed management plan dependent on the coordination of private landowners, land management agencies and the Weed Mitigation Department, it is our hope that the weed management aim of these individuals and organizations can be synchronized to facilitate the maintenance and restoration of the ecological and economical health of the Montrose County landscape. While this document is meant to demonstrate the function and overall aim of the Weed Mitigation Department, we hope that it may also be used as a model for landowners and public land-users committed to the maintenance of the county's ecological health.

1.4 Montrose County Weed Management Infrastructure

Though the role of the Montrose County Weed Mitigation Department has grown to include responsibilities outside state mandates, the primary role for the department is to ensure the county's compliance with state noxious weed law. Though the department was originally created as an independent entity, deliberation has resulted in its restructuring as a part of the Facilities Division.

Operating under the Colorado Noxious Weed Act § 35-5.5-107, the Montrose County Weed Management Commission (established by, and operating under, the Board of County Commissioners) serves as an advisory board for the Weed Mitigation Department. The Montrose County Weed Management Commission will be involved in the development and approval of the integrated management plan for noxious weeds in Montrose County.

The Uncompahgre Valley Pest Control District was created in 1964 pursuant to Article 16, Chapter 6, Colorado Revised Statutes of 1953, to ensure the management of harmful invasive species within the boundaries of the district. The creation of the district was voted on and approved by residents falling within the boundaries of the district. The Uncompahgre Valley Pest Control District Advisory Committee may provide recommendations to the BOCC and pest inspector for management of issues concerning invasive species within the boundaries of the Pest District. In accordance with § 35-5-111 Colorado Revised Statutes, moneys collected from residents within the boundaries of the Uncompahgre Pest Control District for the purpose of management within the district, will be set apart from funds allocated for countywide pest control and utilized for the management of invasive species within the boundaries of the district.

In addition to tax levies (implemented for both countywide and district-specific pest management), the Montrose County Weed Mitigation Department will seek additional funding from outside sources (grants, interagency projects etc.) to supplement funding for treatment of invasive species. See sections 2.3, 3 and 4.2 for clarification of management practices and allocation of funding.

Maps of the Uncompahgre Pest Control District and Cooperative Weed Management Areas can be found in Appendix A.

1.5 Goals of the Montrose County Weed Mitigation Department

1. To reduce, to the best of our ability, the impact and extent of ecological damage resulting from the proliferation of noxious weeds.
2. To develop and support best management practices for noxious weed species in Montrose County.
3. To facilitate the stewardship of public and private lands as it pertains to noxious weed species.
4. To support and aid other organizations in their pursuit of goals running parallel to those of the Montrose County Weed Mitigation Department.
5. To facilitate for the users, community leaders, landowners, developers and resource managers of Montrose County, a better understanding of the economic and ecological impacts of the intrusion of noxious weeds.
6. To educate the public on the effectiveness, safety and necessity of the treatment methods employed by the Montrose County Weed Mitigation Department.
7. To prioritize weed management efforts in a way that best utilizes funding and manpower in the pursuit of biodiversity and the economic and ecological health of the landscape.
8. To seek partners and supplemental funding to adequately achieve management goals for Montrose County's noxious weeds.
9. To create an understanding of the measures that the department takes in combating invasive species, especially as they pertain to the obligations that arise from the acquisition of outside sources of revenue.
10. To inform the public about the monetary and biological constraints that the Montrose County Weed Mitigation Department faces in combating the spread of noxious weeds.
11. To adhere to the state guidelines set fourth in the Colorado Noxious Weed Act.

Section II: Evaluating and Responding to Invasives

2.1 Weed Species Categorization

The weed species on the Colorado Department of Agriculture's Weed List fall into three categories based largely on their level of infestation within the state.

- 2.1.1 "List A"** weed species have been targeted for eradication by the Colorado Commissioner of Agriculture. These species are categorized by their invasive nature, manageable levels of infestation within the state, the potential impact of their introduction and their potential for expansion.
- 2.1.2 "List B"** species are established species for which state noxious weed management plans have been implemented to stop continued spread.
- 2.1.3 "List C"** species are species for which the state supports local government's management on private and public lands.

The Montrose County Weed Mitigation Department will comply with state standards for treatment of species falling into these categories.

2.2 Treatment Standards for List A, B and C Species

- A. With the objective for treatment of “List A” species being eradication, control methods will seek to eliminate the plant prior to seed production and detect and eliminate plants arising from seed, reproductive propagule, or root stock. Treatments will be conducted for the duration of the plant’s reproductive viability and will continue until eradication of the species has been achieved. Mapping of “List A” species will be conducted to facilitate the effective treatment of infestations in subsequent years, and to provide data for the Colorado Department of Agriculture.
- B. Species that fall into the “List B” category and are designated for eradication will be handled in a similar manner as those categorized as “List A,” so long as those measures don’t interfere with the treatment efforts for priority species. For those “List B” species where eradication isn’t feasible, measures undertaken in the containment of the infestation will be conducted in accordance with the Rules Pertaining to the Administration and Enforcement of the Colorado Noxious Weed Act 8 CCR 1206-2.
- C. Treatment of “List C” (and weeds existing outside the state weed list) will occur on a case-by-case basis. Treatment will typically occur when the species is encountered during routine management of priority species and will be subject to an applicator’s assessment, where the level of infestation, cost of treatment and susceptibility to the treatment method is expected to yield a favorable result. Further treatment of weeds failing to meet the state’s high priority list will occur when deemed appropriate (exemplified by infestations on county facilities and rights-of-way).

2.3 Circumstantial and Site-Specific Response to Weed Management Issues

Though the Colorado Noxious Weed Act gives Montrose County authority to enforce state and county weed law, resources allocated to promote responsible land management are utilized in weed management projects. Implementation of best management practices by landowners, land management agencies, retailers and land-users allows the Weed Mitigation Department to broaden the scope of its management efforts and focus on projects that promote the ecological health of Montrose County as a whole. Though enforcement may occur in extreme cases of noncompliance, the Montrose County Weed Mitigation department will encourage residents’ participation in countywide integrated pest management projects and focus its efforts on treatments that achieve management goals.

Negligent land management practices may be addressed in a manner that reflects the severity of the situation. Though the department hopes to minimize the need for enforcement, the department is most likely to mandate management practices when dealing with priority species—typically “List A.” As the department seeks supplementary funding to implement ecologically sound management practices on private property occupied by high-threat species (see section 4.2.1), measures may be taken to ensure the cooperation of noncompliant landowners. Such measures will be conducted in accordance with the Colorado Noxious Weed Act § 35-5.5-109.

2.3.1 Public Lands

Any board, department or agency responsible for the management of public lands that lie within Montrose County will be expected to implement an adequate integrated pest management plan where necessary. Treatments should be made to A and B species weeds in addition to any county or state weed plans implemented for the treatment of List C species. Implementation and evaluations of integrated pest management plans should be conducted in accordance with the Colorado Noxious Weed Act § 35-5.5-110.

2.3.2 Private Lands

Montrose County landowners will be expected to address noxious weed management issues in a manner that meets the demands of the infestation. The current Colorado Noxious Weed List can be referenced in section 5.2 along with management strategies utilized by the Weed Mitigation Department in the treatment of priority species 6.2. List A and List B species weeds should be treated along with any additional priority species for which Montrose County has developed management expectations. Any inspections or treatments by the Montrose County Weed Mitigation Department will be conducted in accordance with the Colorado Noxious Weed Act § 35-5.5-109.

2.3.3 Continuation of Weed Policy for Public and Private Property

Both areas at risk for the development of weed infestations and areas that have the potential to spread existing infestations will be expected to submit a weed management plan to be reviewed and approved by the Weed Mitigation Department. Management plans should be tailored to meet the demands of the infestation(s), with management assessments conducted by someone qualified to make such assessments. Properties requiring a weed management plan are exemplified by major subdivisions and gravel pits.

2.3.4 Rights-of-Way

The Montrose County Weed Mitigation Department will conduct weed treatments on county rights-of-way with prioritization of treatments and the appropriation of funds based on the severity of the infestation and the species in question. Measures taken will include control methods meeting the standard for treatment of “A” and “B” species weeds and species whose management is deemed necessary. In addition to treatment of species on the Colorado Noxious Weed List, the Weed Mitigation Department may conduct right-of-way treatments for government entities whose interests fall outside the scope of the Colorado Noxious Weed Act. Agencies like Montrose County Public Works or the Colorado Department of Transportation may elicit the aid of the Weed Mitigation Department in the nonselective or species-specific treatment of plant populations that cause concern within the scope of their weed management aim. In conducting treatments for other agencies, the Montrose County Weed Mitigation Department will adopt management strategies that achieve the aim of the organization in question—so long as those strategies don’t run in opposition to the goals and limitations of the Weed Mitigation Department.

2.3.5 County Facilities

List A and List B species on county facilities will be treated in compliance with the Colorado Noxious Weed Act. Treatments of undesirable species present on county facilities will be conducted upon request of facilities maintenance or airport operators. Treatments may fall outside the scope of the Colorado Noxious Weed Act and will be conducted in a manner consistent with the rules and regulations of pesticide application. Control measures may be taken to maintain desirable foliage or to seek compliance with city ordinances, FAA regulations, and safety standards.

Section III: Acquisition and Allocation of Funding

Though Weed Mitigation is a department within Montrose County and acts to achieve weed management goals critical to the health of the Montrose County landscape, working with other agencies necessitates a weed control philosophy that extends beyond the scope of county funding. Though the acquisition of additional funding allows for the department's responsibilities to the county to be more easily met, additional funding is accompanied by additional obligations to the organizations responsible for that revenue.

With a significant portion of the current funding for treatments conducted by the Montrose County Weed Mitigation Department coming from grants, the distribution of work conducted by the department reflects the purpose for which those grants were initialized. In this way, the evaluation of weed control efforts (and the allocation of funding) becomes less departmentalized, and is subject to the weed management aim of the organization providing monetary compensation. The department only engages in projects and pursues supplemental funding that seeks to achieve/support the management goals of the department and the ecological wellbeing of the landscape. It is through the support and participation of these organizations that the Montrose County Weed Mitigation Department is able to go beyond the minimum standard for weed control. The following section will detail what forms of weed control are emphasized and why.

Section IV: Management Approaches

4.1 Treatment Techniques Employed by the Weed Mitigation Department

Though this section gives a general overview of what could be expected from season to season, the Montrose County Weed Mitigation Department could be expected to deviate from these treatment strategies to maximize the effectiveness of management efforts. In order to create an effective integrated management program for a department or specific species, a periodic evaluation of management strategies is necessary to adapt to obstacles like increased pesticide tolerance in a given population, seasonal climate shifts, industrial advancements in treatment methods, introduction of new invasive species, increasingly effective control of existing infestations, reevaluation of the potential impacts of an existing population, and bureaucratic shifts in perception of a species. The following sections detail treatment strategies employed by the Montrose County Weed Mitigation Department, and though a similar approach could be expected in coming years, they should not be interpreted as an itinerary for future management.

4.1.1 Prevention

Though most of the treatments conducted by the department are a reaction to an arising management issue, preventing the establishment of an invasive species is a more cost-effective and ecologically sound practice. With treatment of an invasive usually arising from the discovery of the species in a treatment area, “prevention” often means eliminating parent populations (on site or on neighboring sites) prior to widespread establishment. This concept is akin to the Early Detection and Rapid Response policy detailed in the upcoming section. Though this is largely representative of the department’s response to young populations of invasives, the department will prevent the establishment of priority species with proactive approaches when their encroachment can be predicted. Preemptive management practices will be undertaken when the monetary and potential ecological costs of the treatment can be accurately compared against, and are outweighed by, the ecological and economic loss predicted as a result of inaction. As both labor and monetary expenditures of preventative management projects are low (as compared to treatment of established populations), landowners are encouraged to combat invasives prior to their establishment or when populations are small. The most effective means to prevent the establishment of an invasive species is to implement land-use practices that minimize soil disturbances and insure seeds, roots, stalks etc. aren’t introduced.

4.1.2 Early Detection and Rapid Response

With its compliance to the statewide implementation and monitoring of an Early Detection and Rapid Response system (EDRR), the Montrose County Weed Mitigation Department can be expected to make effective treatments to young infestations whose exponential growth would otherwise yield management costs and ecological effects proportionate to that growth. With a seasonal weed management plan in place, enacting a rapid response to a developing infestation necessitates a plan with a flexibility that reflects the importance of combating an infestation in its infancy. Though acreages treated during EDRR are often significantly smaller than those of methods employed in other types of infestations, early treatment is an effective use of resources that can be expected to save time, money, energy and the ecological health of the landscape. Though the Colorado Department of Agriculture’s EDRR program encourages treatment of List A species on a statewide level, the Montrose County Weed Mitigation Department will utilize these concepts in the treatment of all weed populations to which these concepts can be effectively applied.

4.1.3 Scouting and Mapping

Scouting and mapping individual weeds and infestations has become an integral part of the treatment strategies implemented by the Montrose County Weed Mitigation Department. Though scouting and mapping often occur as a byproduct of weed treatments, they are invaluable tools for developing both future treatment strategies and understanding of the effectiveness of management efforts. Scouting for young weeds can be conducted from the previous season’s mapping, allowing for early treatments of plants that may have been overlooked otherwise. Scouting most often occurs while treatments are being made; a GPS is used to pinpoint locations of infestations and individual weeds. Scouting and mapping is most common when dealing with

species whose distribution is sparse or with priority species where eradication necessitates detailed knowledge of the infestation. Mapping showcases the severity of a given infestation and is utilized further in the acquisition of supplementary funding.

4.1.4 Integrated Pest Management

Integrated pest management involves the use of two or more management techniques to control a noxious species. Integrated pest management techniques will be utilized when necessary, when the use of a single treatment method is cause for concern, or when the implementation of those strategies is expected to yield a result that is preferable to a single treatment method. Though this section is using a strict construction of the term “Integrated Pest Management,” it should be noted that all management techniques adopted by the Montrose County Weed Mitigation Department are selected through an integrated approach; the treatment method is chosen through the examination and evaluation of all known management strategies and chosen for its effectiveness, efficiency and predicted impact to native/desirable ecological elements.

4.1.5 Mechanical Control

Some of the mechanical control methods employed by the Montrose County Weed Mitigation Department include using chainsaws, reciprocating saws, handsaws and loppers on trees and brush; digging and pulling weeds; and clipping and bagging a plant or its reproductive mechanisms. Management methods utilizing mechanical control are typically part of an integrated pest management plan and may grow to include the use of additional equipment and techniques.

4.1.6 Herbicide Application

- A. Rights-of-way** applications are typically made using spray trucks, and are conducted in a way that maximizes the effectiveness of the treatment while minimizing risk to desirable plants. Weed species will be targeted with selective herbicides whenever possible and applications will be made to species that share a susceptibility to the herbicide in use—so long as a desirable effect is expected. In addition to treatments of noxious weeds, the Weed Mitigation Department will make treatments to sites where plant life may create safety issues (line of sight issues etc.). Refer to section 2.3.4 Rights-of-Way for details.
- B. Bare ground treatments** will be made at the request of Road and Bridge and will consist of a two-foot swath on the edge of the road bed (applied prior to paving). These treatments will be non-selective and will be made to maintain the integrity and longevity of the road.
- C. Off highway vehicles** will be utilized in areas that are inaccessible by spray truck. Rights-of-way, private and public lands will be spot-sprayed or broadcast (in areas of high density or where a low impact to desirable plant life is expected)). Typical applications will be made with selective herbicides.

- D. Backpack/hand spraying** will occur in areas that are otherwise inaccessible or where the wellbeing of the landscape is of particular concern.
- E. Aerial applications** may be made by private contractors where warranted by the severity of the infestation or in areas where other treatment methods are expected to fall short of management expectations.
- F. Treatment of Noxious Tree Species** will be conducted in the manner best suited to a given scenario. The methods utilized by the Weed Mitigation Department in the management of undesirable trees include, but are not limited to, foliar applications, stump treatments, injector lances, and frill treatments.

4.1.7 Biological and Cultural Control

If a positive result is expected from the use of a cultural or biological control strategy, the Montrose County Weed Mitigation Department may implement the management strategy (following an analysis of its cost and benefits). When utilizing a cultural or biological control method, treatment areas often expand beyond the scope of the original project; if an organization or individual is conducting cultural or biological control inside Montrose County, the Weed Mitigation Department will support those efforts, so long as they are conducted in the best interest of the landscape. An example of a biological control project affecting Montrose County is the migration of the tamarisk beetle through the San Miguel River system.

Reseeding infested areas is a practice commonly conducted by agencies like the BLM, USFS, NRCS and Uncompahgre Partnership, and is an example of a cultural control method that may be utilized by the Weed Mitigation Department.

When conducting treatments of noxious species', the Montrose County Weed Mitigation Department will keep records detailing treatments on a given day or location. Records will be made in accordance with the Colorado Pesticide Applicators Act § 35-10-111 and kept on file for a minimum of three years.

4.2 Collaborative Weed Management Projects

The Montrose County Weed Mitigation Department may support and/or engage in weed management projects that fall outside the scope of both the department's typical weed management efforts and of county jurisdiction.

As weed infestations exist without consideration for county lines or jurisdictional boundaries, interagency cooperation is a necessity for the successful management of weed issues. The Weed Mitigation Department will facilitate and engage in projects that support other counties, land management agencies, landowners, and private applicators, so long as the goals and treatment strategies employed are conducted/achieved lawfully and are in the best interest of the landscape. In addition to supporting the weed management projects of these agencies and individuals, the Montrose County Weed Mitigation Department may elicit the aid of these entities in the treatment of the county's

weed management issues. Costs associated with treatments conducted outside the department's jurisdiction will be assessed to the responsible organization/government entity or may be compensated through a comparable donation of time or resources.

4.2.1 Support for Private Landowners

With the health of the Montrose County landscape dependent on the participation of all county residents, the Montrose County Weed Mitigation Department will make reasonable efforts to aid in landowners' treatment of priority weed infestations. As successful weed treatments are often dependent on the choice of chemical, application rates, timing of application, weather and other factors, employees of the Weed Mitigation Department will make themselves available to advise appropriate treatment methods. Literature and other resources will be made available to aid in weed identification and treatment strategies.

In addition to providing advice, the department's acquisition of grant funding has allowed the implementation of weed treatment programs to aid landowners with specific weed issues. As the resources for such programs are finite and dependent on species and/or geographical location, the availability of these programs is limited; the duration of a program is subject to budgetary constraints as well as other considerations and could be expected to change or end in upcoming years.

A. Department Treatments on Private Property

Allocation of grant funding specific to a species or location allows for the Weed Mitigation Department to make applications to some private property. The department will work with landowners to ensure management expectations for priority species are met. Though the Weed Mitigation Department may make applications to private property, they in no way absolve the landowners of their weed management obligations. Applications to private property consist primarily of List A and List B species for which management plans have been developed. Details concerning weed management on private property can be referenced in section 2.3.2.

B. Cost Share

A cost share program is currently available to residents of Western Montrose County where a portion of the cost of chemical (applied by landowner) or cost of application (made by private contractor) is paid through grant funding. As the program is dependent on the availability of finite grant funding, the continuation and duration of the program will be reevaluated on an annual basis. The West End Cost Share Program was developed utilizing a grant that mandates the use of funds in Western Montrose County (funds cannot be appropriated for the expansion of the cost share program to Eastern Montrose County). Treatment methods must meet the standards of the department to qualify for the cost share program. West end residents are encouraged to contact the Montrose County Weed Mitigation Department to apply for cost share reimbursement. A list of eligible species and rate of reimbursement will be reevaluated on an annual basis. A current list of species eligible for reimbursement is as follows:

- **Priority Noxious Weed Species
(eligible for 100% reimbursement)**
 1. Yellow starthistle
 2. Purple loosestrife
 3. Leafy spurge
 4. Yellow toadflax

- **General Noxious Weed Species:
(eligible for 50% reimbursement)**
 1. Spotted knapweed
 2. Russian Knapweed
 3. Diffuse Knapweed
 4. Dalmatian toadflax
 5. Tamarisk
 6. Russian Olive
 7. Whitetop
 8. Oxeye daisy
 9. Houndstongue
 10. Canada thistle
 11. Bull thistle
 12. Musk thistle

For information on management of a specific species, reference section 6.2 *Timelines and Management Strategies for Montrose County Weeds*.

With organizations like the Natural Resource Conservation Service providing additional cost share for control of specific weed species, residents of Montrose County are encouraged to explore options for chemical reimbursement. Though employees will be made available for management advice, landowners must read chemical labels in their entirety and conduct treatments that meet the manufacturer's recommendations. The Montrose County Weed Mitigation Department will assume no responsibility for undesirable effects resulting from a landowners weed management or from negligent or malicious utilization of advice obtained from the department.

4.2.2 Collaboration with Land Management Agencies

Land management agencies like the Bureau of Land Management, U.S. Forest Service, National Park Service and Division of Wildlife may elicit the aid of the Montrose County Weed Mitigation Department in management projects. With approved management strategies varying from organization to organization, the department will conduct treatments in a manner consistent with the stipulations of the organization in question. Management strategies must be consistent with the practices of the Montrose County Weed Mitigation Department, the cost of which will be assessed to the organization in question. In addition to support for land management agencies, the practices detailed above will be extended to organizations like the Natural Resource Conservation Service, Uncompahgre Partnership, and Tamarisk Coalition. Policies concerning management projects that fall outside the department's jurisdictional boundaries are detailed in the following section. Details concerning rights-of-way can be referenced in section 2.3.5.

4.2.3 Cooperation with Neighboring Counties

As weed management issues can easily cross county borders, the Weed Mitigation Department may engage in treatment efforts implemented by other counties. As an increase in manpower can often drastically improve the effectiveness of a control method, the exchange of resources with neighboring counties can result in a level of containment that prevents the spread of an infestation to Montrose County. With the positive effects of these efforts potentially preventing the future expenditure of resources, labor is often traded back and forth between counties. On occasion, the geographic location of a weed infestation makes treatment more accessible to weed managers of another county. In these cases, treatment of weed infestations may be conducted by weed managers in neighboring counties or vice-versa. Weed treatments in Montrose County's jurisdiction may be conducted by outside sources only after communication with the Weed Mitigation Department has determined it to be the best course of action.

Montrose County is currently participating in the Paradox, Tabeguache, Horsefly, North Rim and a few less-formal Cooperative Weed Management Areas (CWMA's). The Weed Mitigation Department is in the development stages for two additional CWMA's. These agreements would coordinate the efforts of neighboring counties and land management agencies for specific geographic areas to ensure the effective usage of time and resources in shared weed management projects. The Wright's Mesa Cooperative Weed Management Area would be an agreement primarily between San Miguel and Montrose counties. A CWMA between Montrose, San Miguel and Ouray counties is currently in development.

4.2.4 Support and Utilization of Commercial Applicators

It is not the intent of the Montrose County Weed Mitigation Department to compete with commercial applicators operating within Montrose County, and in addition to support of qualified commercial applicators, the department will occasionally utilize the specialized application techniques that they have to offer. The department has contracted applicators with amphibious and aerial equipment in the past and will continue to do so as long as the management aim demands those treatment methods.

4.3 General Management Strategies and Responsible Land Use

With invasive species capable of eliminating native species and forage for wildlife and livestock, the trickle-down effects of their introduction can quickly degrade the ecological health and economic viability of a landscape. Though the pest management strategies implemented by the department are an effective means to control an existing population, successful management is dependent on the prevention of new populations. As the measures taken by the Weed Mitigation Department are often a reaction to an arising pest management issue, a proactive approach to management of noxious species is dependent on the actions of landowners and public land-users.

Whether a given piece of land is used for agriculture, recreation or is simply appreciated for its intrinsic values, the function and value of that land is dependent on its ability to sustain those qualities. Whether the functionality of a landscape is defined through agriculture, recreation or ownership, the qualities that define its value are dependent on

the stewardship of those who appreciate and utilize those qualities. The following section will detail responsible land management practices and general management strategies for landowners and recreational land-users.

4.3.1 Strategies for Managing a Weed Infestation

An understanding of the qualities that make a species competitive is critical to developing an effective management strategy. Though the qualities that make a species an effective invasive vary from plant to plant, some general treatment strategies can be applied to most infestations.

A. Prevention

As the establishment of a weed population is dependent on its initial introduction to the site, preventing the migration of seeds and reproductive mechanisms is the most effective way to guard against infestation. With preventative management concepts existing as a proactive approach to weed management, these concepts can be applied by individuals who wish to ensure a landscape is free from infestation and individuals who wish to ensure an encountered infestation remains localized. Examples for concerned landowners would include monitoring and treatment of property lines and natural migration routes. These strategies ensure potential infestations aren't established and existing infestations don't escape to neighboring properties and landscapes. Various cultural, chemical, mechanical and biological control measures can be applied in these scenarios and can be referenced in the following sections. Recreational and agricultural use of public lands should ensure seeds and reproductive mechanisms (encountered on both private and public lands) aren't carried to remote locations and aren't made more effective within the boundaries of an infestation. See sections [4.1.1](#), [4.3.1 B through F](#) and [4.3.2](#)

B. Scouting, Mapping and Inventorying

Development of an effective management plan starts with knowledge of the infestation. After the species' distribution across the property is understood management strategies can be evaluated, management efforts can be prioritized and the effectiveness of treatments can be scrutinized.

C. Developing a Treatment Strategy

After a species is correctly identified and inventoried, an effective treatment strategy can be developed. Though treatments should take steps to achieve eradication, short-term management strategies should prevent seed production and root spread. Treatments of large infestations may initially consist of containment and suppression strategies but should move toward eventual eradication. Though other treatment options may exist, some integrated pest management strategies including chemical, mechanical, cultural and biological control methods can be found in Section [4.1 Treatment Techniques Employed by the Weed Mitigation Department](#). Effective management strategies for some of the species encountered in Montrose County are detailed in Section [6.2 Timelines and Management Strategies for Montrose County Weeds](#)

D. Maximizing the Effectiveness of a Treatment

Before a management plan is put into effect, research should be conducted to ensure the effectiveness of treatment efforts. Practices including the coupling of adjuvants with chemicals, the implementation of safe and effective application methods and the utilization of multiple management techniques (integrated pest management), can dramatically increase the effectiveness of a treatment. Members of the Montrose County Weed Mitigation Department will make themselves available as a resource for affected landowners.

- The implementation of an integrated pest management plan can reduce management costs, reduce the time it takes to achieve a management goal and create a more ecologically/economically sound result. Though one treatment method is often more effective than another, coupling chemical, mechanical, cultural and biological control methods should be considered. The complimentary results achieved through the combination of treatment methods can be exemplified through the coupling of chemical and cultural control. When herbicide application is followed by the introduction of a desirable species, the herbicide eliminates much of the species' competition and, as the desirable vegetation matures, the relative health of the landscape diminishes the weed's competitive edge.
- In line with the use of integrated pest management, the use of multiple herbicides with varying modes of action is a sound management practice. Whether applied separately or in a single application, variability in the chemical processes of different herbicides can increase the effectiveness of treatments and reduce the potential for herbicide resistance. Tank mixtures should follow the manufacturers' recommendations.
- Factors like chemical rates, application timing, weather, equipment calibration, and combination of herbicides can affect the outcome of a treatment. Insuring these and other variables are being addressed can maximize effectiveness, shorten treatment timelines, and minimize cost. Chemical labels should be read and followed explicitly and management efforts should be carefully planned. Sometimes tweaking a management technique is enough to increase success dramatically. The use of a spray pattern indicator (herbicide dye) is an example of an inexpensive practice that ensures adequate coverage and uniform chemical distribution.
- Adjuvants, when added to a chemical carrier, can spread herbicide evenly over the surface of a plant, induce the plant to absorb the herbicide more readily, adhere the herbicide to the plants surface, optimize the pH level of chemical carrier and inhibit the plant's breakdown of the herbicide. The introduction of the right adjuvant can decrease treatment cost by maximizing an herbicide's effectiveness.

E. Prioritizing Treatments

In cases where eradication is expected to take several applications, maximizing effectiveness is dependent on prioritization of treatment efforts. As is the case with most weed treatments, containment is the first step toward eradication.

- Priority should be given to areas where transmission of the weeds reproductive mechanisms is probable. Property lines, roads, drainages, and game/livestock trails should be treated first. Particular attention should be paid to areas where weeds' reproductive mechanisms will be carried off-site (gravel, soil, compost, fertilizer, plant matter etc.)
- Outlying plants and plant populations should be treated next. As treatment of these weeds has a greater impact on future populations, treatment should be made when isolated populations are small and cost of application is low.
- Treatments of large infestations (where management is expected to be achieved after multiple applications or over the course of multiple seasons) should start at the perimeter and move toward the center. With the most detrimental growth of a population occurring primarily on the borders of the infestation, treatments should begin on the outermost edges and be stepped in concentrically from one treatment to the next. Though treatments can realistically reduce the radius of almost any infestation by fifty feet per year, management goals for most infestations should exceed this minimum.

F. Monitoring

Monitoring may include mapping, taking pictures, creating test plots or simply noticing the effects of management efforts. This data can help develop an understanding about the strengths and weaknesses of the implemented management strategies.

Some weed species have seeds that can remain viable for decades. Awareness of the potential for a recurrence can prevent the increased expenditures that accompany the future management of an unchecked weed population.

4.3.2 Public Land Use

As the biological success of a noxious species is largely dependent on its ability to propagate, highly-evolved means of reproduction often take advantage of human elements. When considering the potential for spread of noxious species through recreational activities, care should be taken to prevent the contamination of an otherwise healthy ecosystem. Though invasive aquatic species aren't currently a major issue in Montrose County, the potential consequences of the introduction of invasive aquatics requires considerations extend beyond forests and parks to lakes and waterways.

Though the nature of the land use can play a large role in the introduction of invasive species (soil disturbances, damage to native plant life etc.), maintenance of equipment is often enough to prevent the introduction of an invasive species. Whether a species' reproductive mechanism is transported on a vehicle's chassis, a boat's hull or a bootlace, preventative measures can be taken to ensure the species isn't relocated. With peoples' capacity to travel vast distances in short periods, the potential to relocate a noxious species to a remote destination is extremely high. With recreation in a given area often dependent on the health of

the ecosystem, the ability of the environment to sustain that recreational use demands responsible practices.

Section V: Colorado Noxious Weed List

5.1 Montrose County Weeds and the State Noxious Weed List

While the following sections detail treatments prioritized by the Weed Mitigation Department, many of the weed management issues experienced throughout the county will fall outside the scope of projects undertaken by the department. The following section is intended as a reference for landowners and lists the species included in the State Noxious Weed List.

5.2 Colorado Noxious Weed List

Though many of the following weed species aren't known to be present in Montrose County, any List A species should be reported to the Weed Mitigation Department immediately. Questions concerning weed identification and treatment can often be answered by visiting the Colorado Department of Agriculture's web site at <http://www.colorado.gov/cs/Satellite/Agriculture-Main/CDAG/1174084048733>. Any additional questions should be directed to the Montrose County Weed Mitigation Department.

Though many of the following species aren't likely to be encountered, species known to have been present in Montrose County will be indicated with bold print.

List A species in Colorado that are designated by the Colorado Commissioner of Agriculture for eradication:

African rue (*Peganum harmala*)
Camelthorn (*Alhagi pseudalhagi*)
Common crupina (*Crupina vulgaris*)
Cypress spurge (*Euphorbia cyparissias*)
Dyer's woad (*Isatis tinctoria*)
Giant salvinia (*Salvinia molesta*)
Hydrilla (*Hydrilla verticillata*)
Meadow knapweed (*Centaurea pratensis*)
Mediterranean sage (*Salvia aethiopis*)
Medusahead (*Taeniatherum caput-medusae*)
Myrtle spurge (*Euphorbia myrsinites*)
Orange hawkweed (*Hieracium aurantiacum*)
Purple loosestrife (*Lythrum salicaria*)
Rush skeletonweed (*Chondrilla juncea*)
Sericea lespedeza (*Lespedeza cuneata*)
Squarrose knapweed (*Centaurea virgata*)
Tansy ragwort (*Senecio jacobaea*)
Yellow starthistle (*Centaurea solstitialis*)

List B weed species are species for which the Colorado Commissioner of Agriculture, in consultation with the State Noxious Weed Advisory Committee, local governments, and other interested parties, has developed and implemented state noxious weed management plans designed to stop the continued spread of these species:

Absinth wormwood (*Artemisia absinthium*)

Black henbane (*Hyoscyamus niger*)

Bouncingbet (*Saponaria officinalis*)

Bull thistle (*Cirsium vulgare*)

Canada thistle (*Cirsium arvense*)

Chinese clematis (*Clematis orientalis*)

Common tansy (*Tanacetum vulgare*)

Common teasel (*Dipsacus fullonum*)

Corn chamomile (*Anthemis arvensis*)

Cutleaf teasel (*Dipsacus laciniatus*)

Dalmatian toadflax, broad-leaved (*Linaria dalmatica*)

Dalmatian toadflax, narrow-leaved (*Linaria genistifolia*)

Dame's rocket (*Hesperis matronalis*)

Diffuse knapweed (*Centaurea diffusa*)

Eurasian watermilfoil (*Myriophyllum spicatum*)

Hoary cress (*Cardaria draba*)

Houndstongue (*Cynoglossum officinale*)

Jointed goatgrass (*Aegilops cylindrica*)

Leafy spurge (*Euphorbia esula*)

Mayweed chamomile (*Anthemis cotula*)

Moth mullein (*Verbascum blattaria*)

Musk thistle (*Carduus nutans*)

Oxeye daisy (*Chrysanthemum leucanthemum*)

Perennial pepperweed (*Lepidium latifolium*)

Plumeless thistle (*Carduus acanthoides*)

Quackgrass (*Elytrigia repens*)

Russian knapweed (*Acroptilon repens*)

Russian-olive (*Elaeagnus angustifolia*)

Salt cedar (*Tamarix chinensis*, *T. parviflora*, and *T. ramosissima*)

Scentless chamomile (*Matricaria perforate*)

Scotch thistle (*Onopordum acanthium*)

Scotch thistle (*Onopordum tauricum*)

Spotted knapweed (*Centaurea maculosa*)

Spurred anoda (*Anoda cristata*)

Sulfur cinquefoil (*Potentilla recta*)

Venice mallow (*Hibiscus trionum*)

Wild caraway (*Carum carvi*)

Yellow nutsedge (*Cyperus esculentus*)

Yellow toadflax (*Linaria vulgaris*)

List C weed species are species for which management goals will not be to stop continued spread but to provide additional education, research, and biological control resources to jurisdictions that choose to require management.

Chicory (*Cichorium intybus*)

Common burdock (*Arctium minus*)

Common mullein (*Verbascum thapsus*)

Common St. Johnswort (*Hypericum perforatum*)

Downy brome (*Bromus tectorum*)

Field bindweed (*Convolvulus arvensis*)

Halogeton (*Halogeton glomeratus*)

Johnsongrass (*Sorghum halepense*)

Perennial sowthistle (*Sonchus arvensis*)

Poison hemlock (*Conium maculatum*)

Puncturevine (*Tribulus terrestris*)

Redstem filaree (*Erodium cicutarium*)

Velvetleaf (*Abutilon theophrasti*)

Wild proso millet (*Panicum miliaceum*)

Section VI: Prioritizing Management of Invasives

6.1 The Department's Assessment of Management Goals

Appropriate levels of treatment for a given species are determined by the distribution of the infestation, the potential damage the species may cause, the estimated cost of treatment and the predicted result of management efforts. Though these variables are dependent on the location of the infestation, evaluating the validity of a management strategy for a given weed usually corresponds to the Colorado Department of Agriculture's classification of the species as A, B or C (see section 2.1). The following comparison of kochia, yellow starthistle and Russian knapweed will show how treatment measures are evaluated.

Though kochia is occasionally treated on rights-of-way or at an airport (as a safety issue), the widespread distribution of the weed means no reasonable amount of time and money would result in an acceptable level of management. Conversely, as an extremely invasive species with sparse distribution, management of yellow starthistle warrants a considerable effort by the Weed Mitigation Department. Though the acreages treated may be significantly smaller than another species on which a comparable amount of time is spent, the necessity for treatment and possibility for eradication validates the expenditure of resources.

In contrast to the management strategies enacted for kochia and yellow starthistle, Russian knapweed is a fairly widespread invasive where foregone containment strategies would result in significant economic and ecological loss. Measures taken to prevent further spread of Russian knapweed result in comparatively high numbers for total area treated; though the time spent in a given location could be expected to decrease drastically year to year, it's highly unlikely that management efforts would ever result in countywide eradication.

6.2 Timelines and Management Strategies for Montrose County Weeds

Countywide treatments of priority species are conducted on a timeline that both maximizes the effectiveness of the management techniques, and minimizes scheduling conflicts for the management of other species. Management techniques detailed in

upcoming sections demonstrate what the Weed Mitigation Department feels are the most effective methods of treatment for a species or infestation in Montrose County. Management strategies have been developed to maximize the effectiveness of treatments based on plant lifecycles, budgetary constraints, time constraints, prioritization of managed species, expectations of landowners/land management agencies, available technologies and the wellbeing of the landscape. As these and other considerations could be expected to change with time, the management strategies employed by the Montrose County Weed Mitigation Department could be expected to evolve to meet these ever-changing demands. In reading this section, it should be noted that Montrose County's weed management issues extend beyond the treatment measures taken by the department; the department has prioritized treatments based on the limitations detailed above. Similarly, specialty projects, contract work and chance encounters with species that don't make our priority list, may result in the treatment of species or utilization of management strategies not detailed below. This section demonstrates what might be expected in a typical season. Though the treatment strategies detailed below could be used by private citizens in the development of management plans, the timing of seasonally-based treatments can be expected to vary year to year and with geographic and meteorological variables like altitude, weather patterns etc.

While the department feels these management strategies are the best course-of-action and could be effectively utilized by landowners and private applicators, the Montrose County Weed Mitigation Department cannot recommend these strategies and will not assume responsibility for any undesirable effects resulting from the implementation of these techniques outside the department. If entities or individuals outside the Montrose County Weed Mitigation Department choose to utilize these techniques in the development of management plans, chemical labels must be read and understood in their entirety with applications following instructions detailed therein.

Unless circumstances render the practice unnecessary, chemical carrier used by the Montrose County Weed Mitigation Department is made more effective with the addition of a nonionic surfactant and a nitrogen-surfactant blend. Buffers may be used to optimize the pH level of chemical carrier, with levels varying based on the herbicide and water source.

6.2.1 Diffuse Knapweed

Though the department's treatments of diffused knapweed are less common than those of the following species, its potential impacts warrant significant treatment efforts when encountered. Diffused knapweed is a "List B" biennial forb that can exist as an annual or short-lived perennial. As it can produce 18,000 seeds per plant and behaves as a tumbleweed when it completes its lifecycle; plants must be eliminated prior to seed production. The weed most commonly invades rangeland, roadsides and riparian areas and displaces native habitat. As a significant threat to biodiversity, perennial grasses, livestock feed and the ecosystem's resistance to soil erosion are at high risk.

Infestations are known to exist along Kinikin Road, O27 Road and the Cimarron area. The Department's preferred treatments include Tordon (picloram), a nonionic surfactant and a nitrogen surfactant blend. Treatments are most effective on plants in the rosette through mid-bolt stages. The most effective treatments will typically occur before late June.

6.2.2 Hoary Cress

With its early lifecycle, hoary cress (commonly referred to as whitetop) is among the first species to be treated in a season. Hoary cress is a perennial that spreads both through its root system and through the production of between 1,200 and 4,800 seeds per plant. As a “List B” species that is peppered throughout the Montrose County landscape, the department’s treatment of whitetop consists mainly of containment and suppression, with eradication of outlying infestations as an occasional goal. The nature of the weed lends itself to containment strategies that consist largely of right-of-way treatments. Treatment of a given right-of-way could be expected if the department believes an infestation is likely to be present and the infestation is reached before its maturity renders treatment ineffective.

Treatments are dependent on the maturity of the plant and begin in mid April with consistent treatments continuing through late May; favorable conditions can result in effective treatments as late as mid June. Eliminating hoary cress along roadsides significantly reduces or eliminates its spread from one location to another—leaving broadcast and hand-spraying from trucks the most frequently used treatment option. Treatments of other broadleaf weeds including curly dock often occur during treatments of hoary cress.

As most of the department’s right-of-way treatments become necessary because of the weed’s encroachment from bordering properties, landowners are encouraged to support the department’s efforts with similar treatment strategies. Though treatments with Telar (chlorsulfuron) can be extremely successful, the chemical’s slow mode of action means visible effects can take several weeks to become apparent; treatments are often most noticeable the following year.

6.2.3 Purple Loosestrife

Purple loosestrife is another “List A” species whose low levels of distribution require action toward eradication. As a perennial forb that can reproduce by both the relocation of stem or root particles and through the production of 2.5 million seeds per year, aggressive control measures are needed for adequate management. With an extensive root system that remains intact from year to year, seeds that remain viable from 5 to 20 years and the ability to spread readily through waterways, the department has developed eradication techniques that emphasize containment.

Purple loosestrife grows in wet, marshy conditions along ditch banks, riverbanks and drainages. With the plant’s preferred habitat along waterways, its high seed production results in an effective method for propagating new areas. As the weeds massive root system begins to block waterways it creates more habitat for itself and reduces the natural and agricultural value of the landscape.

Known infestations exist in Nucla, Naturita and Redvale and are currently treated utilizing grant funding allocated to the area. The proximity of these infestations to the San Miguel River (as well as their existence along the river itself) makes treatments more urgent.

The integrated pest management plan implemented in the treatment of purple loosestrife consists of a variety of herbicides and application techniques along with occasional mechanical control. Herbicide applications begin in late June and continue through late September, with optimal treatments occurring before the plants drop seed. Element 3A (triclopyr) is used in areas where damage to native species and livestock feed is a concern, Habitat (imazapyr) or Aquatic Glyphosate is used where damage to desirable species is of less concern. Chemicals are approved for aquatic use and are spot-sprayed and broadcast using backpack sprayers, OHV's, amphibious vehicles and aircraft. If an infestation is discovered after the plants have flowered, flowerheads are clipped and removed from the site to eliminate seed production. A late-season aerial application to dense populations ensures adequate coverage. Data is entered into a GPS to aid in future treatments.

6.2.4 Russian Knapweed

As an aggressive perennial that spreads through both its horizontal root system and seed production, Russian knapweed is a priority species whose high levels of infestation warrant an aggressive containment strategy. Russian knapweed is allelopathic (it produces toxic substances to inhibit growth of its competitors) and is well adapted to soils with high salinity. These characteristics allow the weed to gain footholds in areas poorly suited to its potential competitors and eliminate those competitors as it spreads to areas with healthy soil. As the weed displaces native vegetation it decreases the viability of range and pasturelands. Like many of the priority weed species targeted by the Weed Mitigation Department, its ability to out-compete desirable plant species in almost any environment is what makes this invasive a concern.

As a "List B" species, containment of Russian knapweed is the primary goal of the department. Elimination on rights-of-way is the primary method for controlling spread, with treatments on gravel pits and outlying populations getting equal consideration. Timing is critical for successful treatment of Russian knapweed. As Russian knapweed has a deep and extensive root system, applications must be made when chemical will be drawn into the roots. The department will make early treatments when 10% of the plants buds are in bloom. This small window allows treatments to be made to some populations as early as mid June and others as late as early July. Early treatments are made with Redeem (triclopyr TEA and clopyralid TEA); the use of Redeem both maximizes effectiveness of treatments and reduces the potential for chemical resistance to herbicides used in late-season applications.

Treatment success for Russian knapweed increases dramatically as the season progresses. After plants cease to use energy for seed production, a reverse in sap flow allows for successful translocation of chemical into the plant's roots. The Weed Mitigation Department will begin extensive treatments of Russian knapweed in mid to late August and continue through November. Applications with Milestone (aminopyralid) have proved to be very successful. Though high success rates can be achieved throughout the winter, the root crown must be exposed; snow is the major limiting factor for late-season Russian knapweed treatment.

6.2.5 Spotted Knapweed

With spotted knapweed on the Uncompahgre Plateau extending across the borders of private landowners and land management agencies, treatment of spotted knapweed serves as an example of the cooperative weed management projects conducted in Montrose County. The cooperation of the BLM, USFS, the Uncompahgre Plateau Project, private landowners and the Montrose County Weed Mitigation Department creates a comprehensive weed management project that meets the criteria of each organization or landowner.

Spotted knapweed is a biennial or short lived perennial forb that produces as many as 40,000 seeds per plant. Infestations are established more readily in disturbed or overgrazed areas and can reduce productivity of the land by out-competing desirable species. As a competitive species, spotted knapweed can thrive in a wet or dry environment and occupy sandy soils, rocky conditions, pastures, roadsides and a variety of other conditions. Spotted knapweed begins its life as a rosette and can grow as large as 4 feet.

Spotted knapweed is a “List B” species whose potential degradation of pastures, grazing permits and wildlife habitat necessitates a relatively aggressive management strategy that is currently focused on containment and minimizing damaging effects. Infestations are currently isolated in Maher and along 6400 Road, with more extensive infestations on the Uncompahgre Plateau (extending along highway 90, from the Ute Area past the east fork of Dry Creek). The Montrose County Weed Mitigation Department performs treatments of spotted knapweed on portions of BLM, rights-of-way, private property and Forest Service land on the eastern side of the plateau; treatment expenditures are assumed by the agency responsible for the land in question, with additional grant funding for treatments on private property. Treatments begin in early June and continue through late August.

Treatment methods vary from site to site and are dependent on application protocols specific to each agency. BLM lands are treated with Redeem R&P (triclopyr TEA and clopyralid TEA), and all other applications are made with Milestone (aminopyralid) or Tordon (picloram). Spray trucks are utilized on rights-of-way, otherwise OHV’s and backpack sprayers are used.

6.2.6 Yellow Starthistle

Categorized as a “List A” species, yellow starthistle is an uncommon weed designated for eradication in the state of Colorado. Yellow starthistle is a winter annual with large plants capable of producing as many as 10,000 seeds. Though the plant germinates in the fall and starts producing rosettes as early as March, conditions in Montrose County can be expected to produce seedlings throughout the summer. Appearance can vary based on its environmental conditions and can produce seed bearing plants ranging from 2 inches with a single stalk to 4 feet with a dense and brushy appearance. Though the plant can reach 4 feet in height, conditions in Montrose County rarely produce plants larger than 2 feet. Though infestations in Montrose County are only known to exist in Uravan and southeastern Montrose County (along Buckhorn Road), awareness of its existence is critical to keeping populations isolated and to maximize the odds of its eventual eradication.

As yellow starthistle is poisonous to some livestock and produces seed that can remain viable for as long as 15 years, the Montrose County Weed Mitigation Department has implemented a comprehensive integrated pest management program that is creating optimism for its eventual eradication. As an annual, effective control of the species is dependent on the prevention of seed production. The low levels of infestation in Montrose County and the potential for a devastating impact on the ecosystem warrant a considerable amount of the department's time and effort. Coupled with the support and participation of affected landowners, the resources expended in the upcoming years could be expected to produce a commendable result and reduce or eliminate the cost of both annual containment strategies and loss of agricultural and ecological viability.

Utilizing grant funding allocated for management of yellow starthistle, the Weed Mitigation Department begins treatments in mid May. Following the state-recommended early application of Milestone (aminopyralid), the department and landowners spot-spray and broadcast using hand sprayers and OHV's; treatments continue through early June. Though Milestone is recommended by the state, the dry landscape renders Milestone less effective than it would be otherwise.

Mechanical control methods begin in late June and continue through late August. With the sparse distribution of the infestation, pulling and digging are effective control methods. Weeds are removed from the site in garbage bags, plants are entered into a GPS and marked with flags; marked points are revisited and sprayed with a "restricted use" chemical—Tordon 22K (picloram). The department estimates that the integrated pest management plan implemented can reduce the number of treated plants by as much as 75% from one season to the next. Treatment of yellow starthistle is funded through grants.

6.2.7 Yellow Toadflax

Though the only known infestations of yellow toadflax in Montrose County are in the vicinity of the 25 Mesa Ranger Station, the nature of the weed demands an early response to new infestations. As a rhizomatous weed that also spreads through seed production, yellow toadflax can effectively displace desirable plant life and develop remote infestations outside an affected area. Yellow toadflax is a perennial whose root system is most effectively controlled during flowering. Though the weed may have a pleasant appearance it displaces habitat and food sources for wildlife and livestock and is mildly poisonous to cattle. Yellow toadflax is a "List B" species, and though it isn't as quick to create a monoculture as some of the other priority species in the county, high genetic variability creates treatment obstacles that are most effectively addressed when populations are young. Though soil disturbances are often a catalyst for infestation, yellow toadflax isn't dependent on those disturbances to gain footholds. Montrose County infestations are spreading most effectively along roadways, game/livestock trails and down drainages.

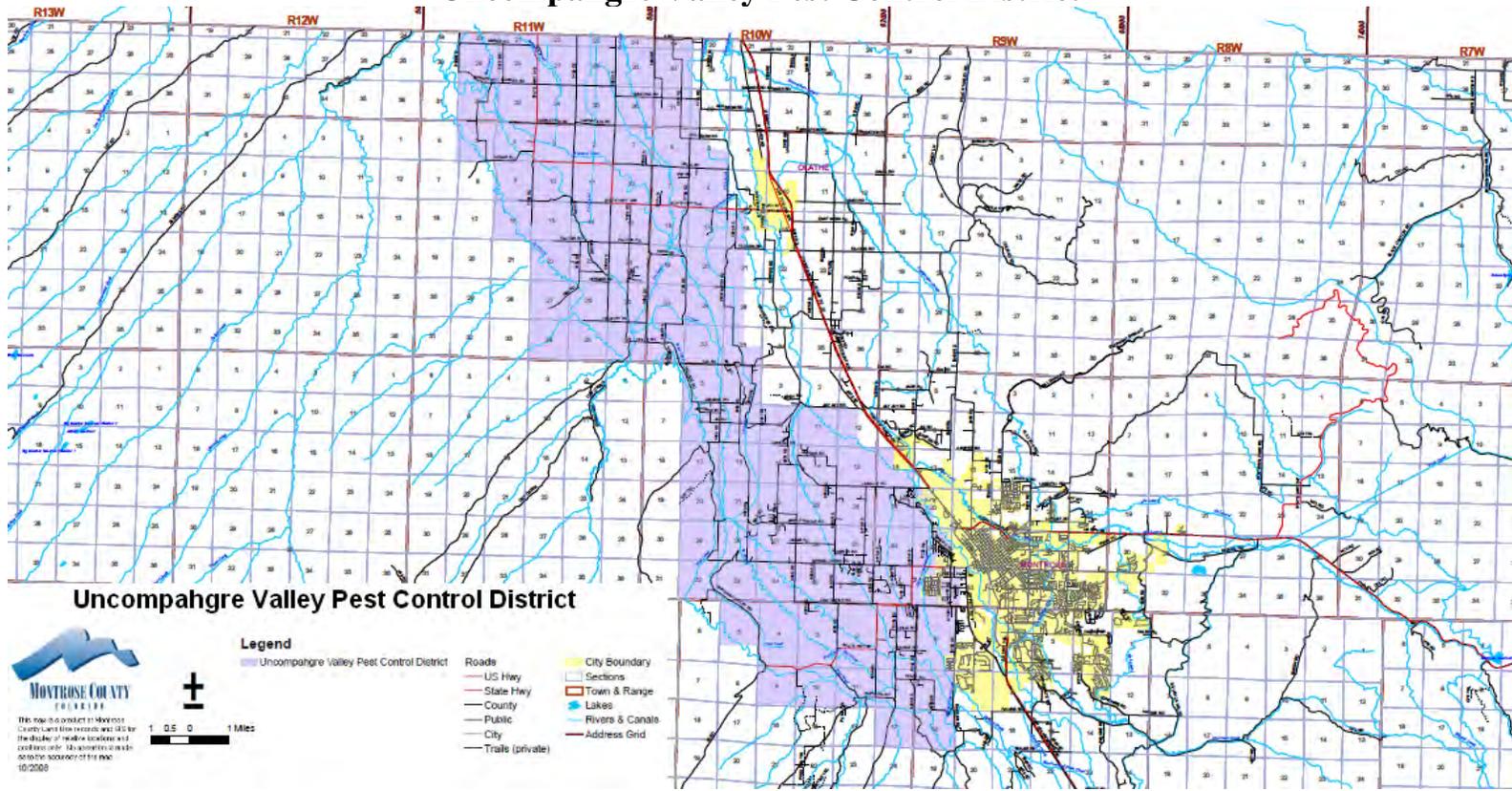
With the location of current yellow toadflax infestations on the Uncompahgre Plateau comes the accessibility issues that accompany densely forested areas and abrupt elevation and geological changes. Coupled with the need for high rates of

carrier and a small treatment window (late June to early August) the accessibility of some of these infestations makes containment of this species critical. With much of the county's yellow toadflax surrounding the 25 Mesa Ranger Station, much of the funding for the project comes from the Forest Service. Additional funding for treatments on private property comes from grants.

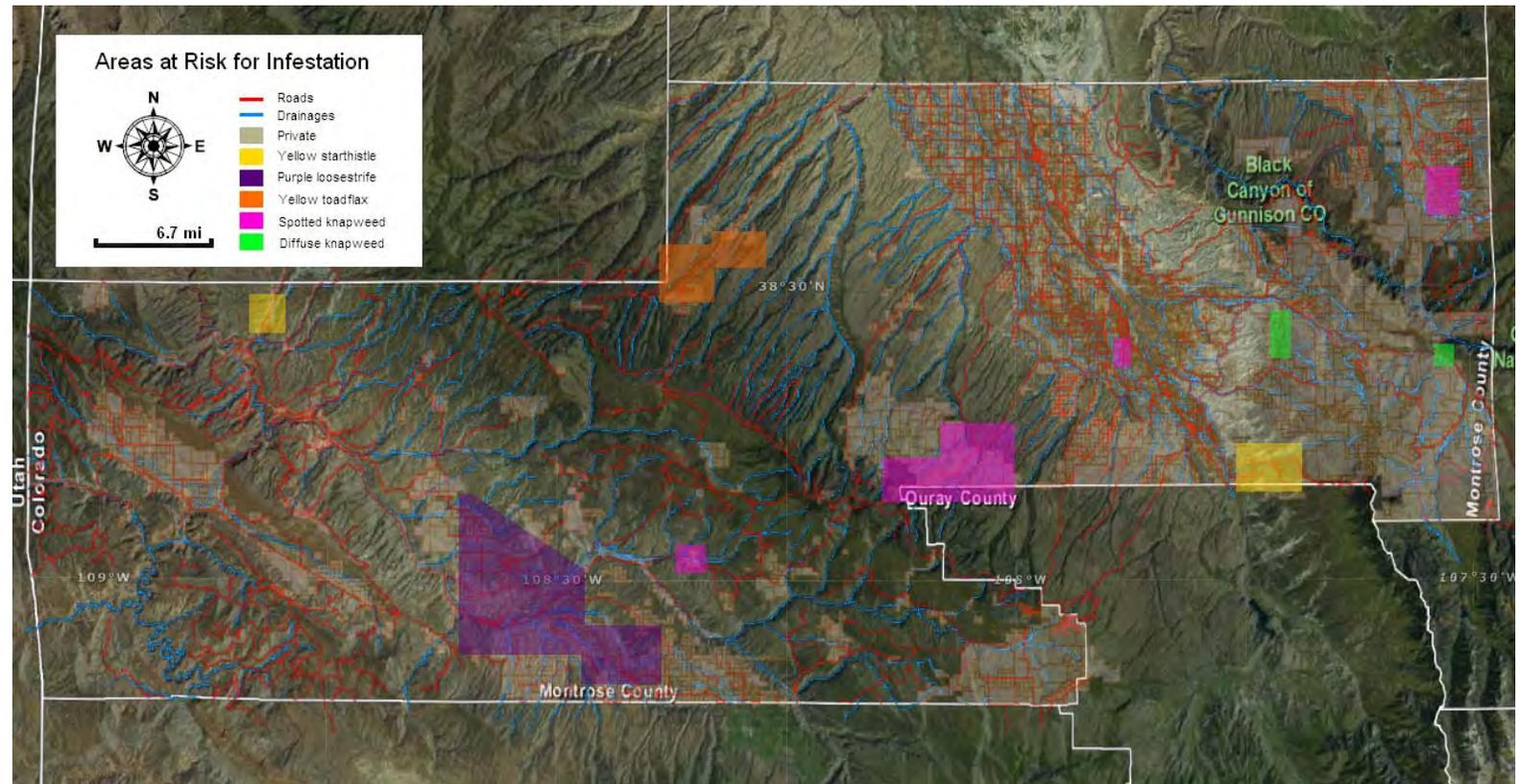
Plants flower at a height between one and three feet and are most effectively controlled using integrated weed management strategies hinging on chemicals with varying modes of action. Effective treatments conducted by the department utilize a "restricted use" chemical called Tordon 22K (picloram) in conjunction with Telar XP (chlorsulfuron), 2,4-D, and a methylated seed oil. As a typical Montrose County infestation consists of sporadically spaced individual plants and localized monocultures, spot spraying is the most effective application method. Applications are made with hand-guns operated from OHV's and spray trucks. Infestations and individual weeds are entered into a GPS to aid in subsequent treatments. Along with its ability to effectively invade healthy ecosystems, the weed's adaptability to a wide range of climates, elevations and soil types makes containment and eventual eradication of this relatively isolated species a high priority.

Appendix A

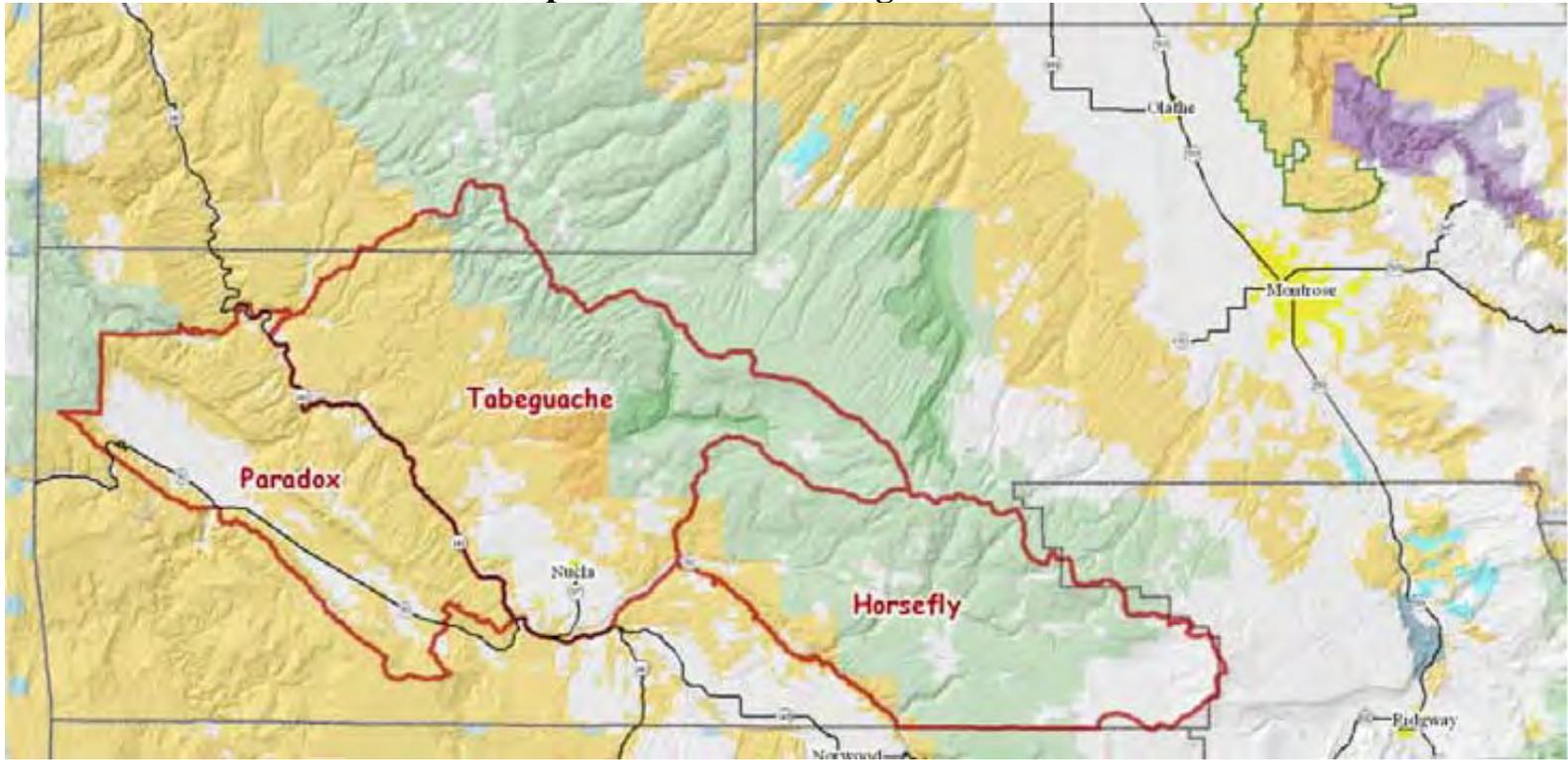
Uncompahgre Valley Pest Control District



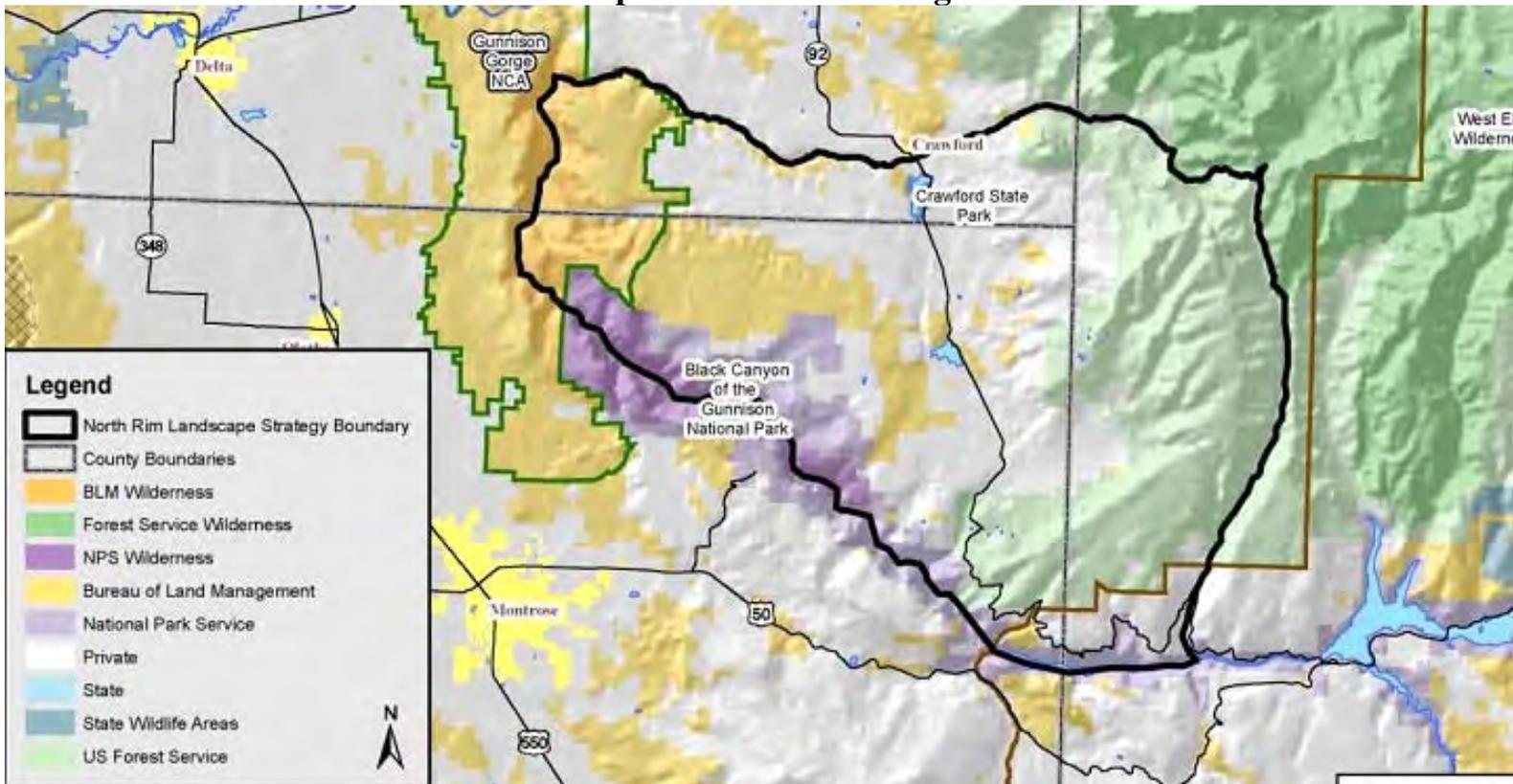
Areas at Immediate Risk of Infestation



Paradox, Tabeguache and Horsefly Cooperative Weed Management Areas



North Rim Cooperative Weed Management Area



Glossary

The following terminology is defined in a manner that reflects the context in which it is used in the document. Though some terms may be defined more broadly when used in a broader context, this glossary defines terms as this document intends them to be interpreted.

Application — Exercising a management strategy on a pest or population (typically refers to herbicide applications).

Biodiversity — The existence of a variety of plant life within an ecosystem or area. Biodiversity is an observable element in any healthy ecosystem. The intrusion of an invasive species is often a direct threat to biodiversity in an ecosystem.

Biological control — The use of living organisms like insects, animals and pathogens to control undesirable vegetation.

BMP — Best Management Practices: utilization of the most efficient, effective and ecologically sound management strategies.

BOCC — Board of County Commissioners

Broadcast application — Uniform application to an entire area.

Colorado Noxious Weed Act — *Title 35 Article 5.5* of the *Colorado Revised Statutes*

Colorado Noxious Weed List — List developed by the Colorado Department of Agriculture to categorize weeds and the threat they pose to Colorado's ecosystem.

Containment — Limiting the proliferation of a noxious species to a given area.

Cultural control — Management practice that relies on manipulation of the species' environment.

CWMA — Cooperative Weed Management Area: area developed to coordinate the management efforts of multiple individuals and organizations/entities.

EDRR — Early Detection Rapid Response: Colorado Department of Agriculture's term/program that defines how young infestations should be managed.

Eradication — Destroying an entire pest population.

Infestation — The establishment of an invasive species in a given area.

Invasive species — Nonnative plant or biotype whose presence adversely affects the ecosystem it invades.

IPM — Integrated Pest Management: the use of multiple management techniques to achieve management objectives.

Management — Controlling, minimizing and eliminating invasive species and the effects they may cause to an ecosystem.

Mechanical control — Managing an invasive species through physical means. Mechanical control methods include digging, pulling mowing sawing and various other management techniques.

Noxious weed — Any plant designated by a Federal, State or county government as injurious to public health, agriculture, recreation, wildlife or property.

OHV — Off Highway Vehicles: department examples include a Polaris Ranger and Argo Avenger.

Pest District — Contiguous territory where residents have voted on and approved the appropriation of funds to deal with the existing or potential threats of the introduction of invasive species. The Uncompahgre Valley Pest Control District was created under § 35-5 Colorado Revised Statutes.

Spot treatment — Application of a pesticide over a small continuous restricted area of a whole unit; i.e., treatment of spots or patches of weeds within a larger area.

Treatment — Any measure taken to achieve the management goals for a given infestation. Methods include herbicide application, mechanical, biological and cultural control.

Unincorporated Montrose County — Rural area that is not within Montrose, Olathe, Nucla or Naturita city limits.

Weed — A plant that grows where it is unwanted. The Weed Mitigation Department typically deals with weeds that pose a significant threat to the ecological health or economic viability of Montrose County.

Weed Management Commission — Advisory board established under § 35-5.5-107 Colorado Noxious Weed Act to approve a management plan for designated noxious weeds.

