# DRAFT

# ENVIRONMENTAL ASSESSMENT

## Zanni Lateral of the Crawford Clipper Ditch Pipeline Project
## Delta & Montrose Counties, Colorado

*Prepared For*

**U.S. Bureau of Reclamation**
**Colorado River Basin Salinity Control Program**
*and*
**The Crawford Clipper Ditch Company**


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**November 2015**

Cover Photograph:

Looking south along the existing Zanni Lateral of the
Crawford Clipper Ditch (September 2015).

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# LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| BLM | U.S. Department of the Interior Bureau of Land Management |
| BMP | Best Management Practice |
| BSP | Basin States Program |
| 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 | Crawford Clipper Ditch 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 |
| FONSI | Finding of No Significant Impact |
| FWS | U.S. Fish & Wildlife Service |
| 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 |
| PL | Public Law |
| PM | Particulate matter |
| Reclamation | U.S. Department of the Interior Bureau of Reclamation |
| SHPO | State Historic Preservation Office |
| SMPW | Selenium Management Program Workgroup |
| THV | Total Habitat Value |
| TMDL | Total Maximum Daily Load |
| 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 |
| USGS | U.S. Geological Survey |

# 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 Crawford Clipper Ditch Company's (the "Company's" or "Applicant's") proposed Zanni Lateral of the Crawford Clipper Ditch Pipeline Project (hereinafter, "Zanni Lateral Pipeline Project," "Project" or "Proposed Action"). The Proposed Action is located in southeastern Delta County and northeastern Montrose County, Colorado, near the Town of Crawford (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.

After a public review period for this Draft EA, Reclamation will determine whether further study or a Finding of No Significant Impact (FONSI) for the Proposed Action is warranted before the Proposed Action can 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 (PL) 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. PL 104-20 of July 28, 1995 authorized the Secretary of the Interior, acting through the Bureau of Reclamation, to implement the Colorado River 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. PL 110-246 of June 18, 2008 amended the Salinity Control Act, establishing the Basin States Program, and authorizing Reclamation to take advantage of new, cost-effective opportunities to control salinity anywhere in the basin.

Both the Basinwide Salinity Control Program and the Basin States Program fund 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 Proposed Action is being administered by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) via the Delta Conservation District, and funded by Reclamation through the Basin States Program. Because Reclamation is providing the funds for the Project, Reclamation is the NEPA lead for the Proposed Action. 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 irrigation ditch with a buried pipe delivery system, eliminating seepage and reducing salinity in the Colorado River basin by an estimated 551 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 Basin States 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 Overview of Proposed Action & Alternatives

The Proposed Action will replace the existing unlined Zanni Lateral irrigation ditch of the Crawford Clipper Ditch System with a buried pipe delivery system, improving the system's efficiency and eliminating ditch seepage in saline soils. The Proposed Action also involves construction of a habitat replacement (i.e., mitigation) site.

The pipeline component of the Proposed Action will be located in southeastern Delta County, Colorado, just west and northwest of the Town of Crawford (Figure 1), and the Habitat Replacement Site associated with the Proposed Action will be located in northeastern Montrose County approximately 3.5 miles south-by-southeast of the Town of Crawford (Figure 1). Both components of the Proposed Action lie in the Gunnison River watershed of the upper Colorado River basin.

The pipeline component of the Proposed Action would entail replacement of approximately 8,885 linear feet of the unlined open Zanni Lateral with a total of approximately 9,225 linear feet of buried irrigation pipe (Figures 3 and 4). Conceptual maps and construction drawings for the pipeline component of the Proposed Action were prepared by Harward Consulting & Engineering of Springville, Utah. The Company proposes to construct the pipeline between Winter 2015 and Spring 2016.

In accordance with the Colorado River Basin Salinity Control Act, the Proposed Action also includes habitat replacement activities to mitigate for habitat losses which would result from the Project. The Habitat Replacement Site is located in an area of existing man-made ponds in the Alkali Creek drainage on private land near the pipeline component of the Proposed Action (Figures 3 and 4).

In accordance with NEPA and the Council on 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 Zanni Lateral. Seepage from this structure would continue to contribute to salt and selenium loading in the Colorado River basin. Riparian and wetland habitats associated with the ditch 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 EA.

## 1.4 Alternatives Considered But Not Carried Forward

Several minor pipeline alignment alternatives were considered during the conceptual design process for the Proposed Action, but eliminated from detailed analysis in accordance with 40 CFR 1502.14 because they were determined to be technically challenging, more challenging from a right-of-way perspective, or more expensive than the Proposed Alternative.

## 1.5 Location & Environmental Setting of the Proposed Action Area

The pipeline component of the Proposed Action will be located in southeastern Delta County, Colorado, just west and northwest of the Town of Crawford (Figures 1 and 2), and a Habitat Replacement Site associated with the Proposed Action will be located in northeastern Montrose County approximately 3.5 miles south-by-southeast of the Town of Crawford (Figures 1 and 2). Both components of the Proposed Action lie in the Gunnison River watershed of the upper Colorado River basin.

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 of both components of the Proposed Action is about 6,500 feet above mean sea level (Figure 3).

The general physical location of the pipeline component of the Proposed Action, including borrow sites and staging areas, is Sections 25, 35, and 36 in Township 15 South, Range 92 West of the 6th Principal Meridian (PM) and Section 31 Township 15 South, Range 91 West of the 6th PM, in Delta County (Figure 3). The general physical location of the Habitat Replacement Site associated with the Proposed Action is Section 30, Township 51 North, Range 6 West of the New Mexico PM, in Montrose County (Figure 3). All components of the Project lie entirely on private land (Figure 3).

The pipeline component of the Project begins in the Town of Crawford (Figures 3 and 4) at a divider headgate (“The Mill”) south of Highway 92 near the Dogwood Avenue intersection. The headgate divides the Zanni, West, and Center Laterals of the Crawford Clipper Ditch system. The pipeline component follows Highway 92 northwest through town, crosses under the highway, then turns north and runs generally north and west through irrigated land to its terminus about 1.3 miles west-by-northwest of the Town of Crawford. The pipeline component of the Project lies in the Cottonwood Creek drainage tributary to the North Fork of the Gunnison River (Figure 5). The Zanni Lateral receives water both directly diverted from the Smith Fork River and Smith Fork Project water from Crawford Reservoir, in the Smith Fork of the Gunnison River drainage (Figure 5). Smith Fork Project water is delivered to the Zanni Lateral via Aspen Ditch, which intersects the Zanni Lateral approximately 1 mile northwest of the Town of

Crawford. Drainage from lands irrigated by the Zanni Lateral flows to tributaries of Cottonwood Creek, and eventually northwest to the North Fork of the Gunnison River.

Four borrow/staging sites for the pipeline component of the Project are located on private lands owned by Company shareholders in the vicinity of the pipeline alignment, as shown on Figures 3 and 4. Borrow/Staging Site #1 lies north of J Street between the Zanni Lateral to the west and BLM lands to the east. Borrow/Staging Site #2 is located adjacent to the east side of Crawford Road near the end of the pipeline alignment. Borrow/Staging Site #3 lies on Company-owned land west of the Town of Crawford and alongside Clipper Ditch. Borrow/Staging Site #4 is north of the Zanni Lateral at the edge of an irrigated hayfield.

The habitat replacement component of the Project is located approximately 3.5 miles south-by-southeast of the pipeline component of the Project on private land (Hart Ranch) in the Alkali Creek drainage (Figures 3, 4 and 5). Two separate areas collectively consisting of approximately 7.7 acres—the CDOT Ponds area and the Tower Pond area—make up the Habitat Replacement Site. As required by Reclamation, the Habitat Replacement Site is on land protected by a conservation easement. Alkali Creek is tributary to Crawford Reservoir in the Smith Fork of the Gunnison River drainage (Figure 5).

Landcover in the vicinity of the Proposed Action Area consists primarily of irrigated hay meadows and pastures, pinyon-juniper woodlands, sagebrush or low semi-desert shrublands, or residential landscaping (Figure 6). Current uses on lands in the Proposed Action Area are residential, irrigated hay production, and livestock grazing.

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, Russian olive, and occasional cottonwoods, but also support a variety of other riparian shrubs and scattered stands of common ruderal herbaceous weeds.

## 1.6 Relationship to Other Projects

Other salinity control projects in progress or recently implemented in the general vicinity include the following (Figure 2):

- Cattleman’s Ditches Pipeline Project (12 miles south of the Town of Crawford, in the Alkali Creek drainage)
- 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 4 (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 Phase I and Phase II Piping Projects (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 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:

- 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
- 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 (see Section 5). Any comments received will be included as Attachment A to the Final EA. This Draft EA will be distributed to Company shareholders, private landowners adjacent to the Proposed Action, and the organizations and agencies listed in Attachment B.

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 Proposed Action 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 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. The results of these inquiries will be included in the Final EA.

- 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 construction of a Habitat Replacement Site existing potential jurisdictional wetlands. As an irrigation construction project, the Proposed Action is exempt from requiring a Section 404 Permit pursuant to the Clean Water Act (33 USC 1344). The applicable exemption from Section 404 of the Clean Water Act is for Farm or Stock Pond or Irrigation Ditch Construction or Maintenance. A copy of the Section 404 Exception Summary and written confirmation of the Proposed Action's exemption has been provided by the U.S. Army Corps of Engineers (Attachment C). 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 EA include a No Action Alternative and the Proposed Action. The resource analyses 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 Zanni Lateral of the Crawford Clipper Ditch. Irrigation practices and seepage from the Zanni Lateral 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, the Zanni Lateral of the Crawford Clipper Ditch would be replaced with buried pipe in the alignments, and habitat replacement activities would take place at the locations shown on Figures 3 and 4.

The pipeline component of the Proposed Action would entail replacement of approximately 8,110 linear feet of the unlined open Zanni Lateral with a total of approximately 14,114 linear feet of buried pipe (Figures 3 and 4), including 8,647 linear feet for irrigation, and 5,467 linear feet for winter stock water delivery. All buried pipe alignments would be installed in or near the existing ditch or ditch prism, with the exception of the last approximately 1,600 feet of pipeline and an approximately 490-foot pipeline spur, which would instead cross irrigated ground and semi-desert shrublands. Approximately 1,660 linear feet of existing irrigation ditch would be abandoned and decommissioned by backfilling (Figure 4). Construction activities would be limited to approximately 60 or 80-foot-wide construction rights-of-way (or narrower in residential areas) throughout the Project alignment.

Pipe diameters would range from 3 to 24inches, and pipe materials would be high-density polyethylene (HDPE) and polyvinyl chloride (PVC) irrigation pipe. Various control structures and shareholder outlets would be installed throughout the Project Area, as specified by the construction drawings. No pumping or compressor stations would be associated with the Proposed Action.

Approximately 4,900 cubic yards of imported fill would be required for pipeline installation and to decommission existing ditches. Proposed borrow sites and staging areas totaling approximately 7.6 acres are located on private lands near the proposed pipeline alignment (Figures 3 and 4). Borrow/Staging Site #1 is approximately 6.2 acres in both previously disturbed (currently farm equipment storage) and naturally vegetated badlands. Both staging of materials and equipment and material borrow would occur at Site #1. Material would be borrowed from an existing upland drainage ditch and an area north of the ditch. The borrow activity would serve to improve the functionality of the drainage ditch, which captures runoff and directs it away from the property owner's residential area. Another borrow area within Site #1 would create a runoff capture basin to accept incidental flow from the upland drainage ditch. Borrow/Staging Site #2 is approximately 0.41-acre previously disturbed area adjacent to Crawford Road, and would be used for staging only. Borrow/Staging Site #3 is approximately 0.36-acre previously disturbed area with a soil stockpile that would be used for borrow material only. Borrow/Staging Site #4 is a small runoff capture basin that would be deepened or enlarged for borrow material only. The need for Borrow/Staging Site #4 to complete the Project is undetermined at this time, but the site is included in this EA so that it can be available during Project construction if needed.

All access ways for construction of the Proposed Action will be on county roads, existing unpaved private roads, and within the pipeline construction corridor. Some minor re-grading of private roads may be necessary following travel with heavy equipment, but no widening of road alignments will occur. A pipeline crossing of Highway 92 and of Crawford Road will be necessary to complete the Project. The Highway 92 crossing will likely utilize the existing Zanni Lateral culvert under Highway 92. The Crawford Road crossing will be a bored or road cut crossing.

The existing ditch alignments operate in prescriptive easements, all on private lands. All 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 Delta County when the surveyed pipe alignments and agreements are completed.

The Company is requesting permanent rights-of-way on private lands for construction, construction access, and for ongoing routine maintenance of the completed pipeline. The permanent 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. Existing access ways to various headgates and valves will be maintained, and no new access ways or new roads will be established along permanent rights-of-way following Project construction.

Pipeline construction would occur incrementally across the Proposed Action Area during Winter 2015 through 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 Borrow/Staging Site #1, and chipped or burned at that location. All disturbed areas would be revegetated with appropriate seed mixes and monitored subject to the Delta Conservation District's requirements 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 stipulations and Delta County standards (Attachment D).

The habitat replacement component of the Proposed Action would mitigate for long-term loss of wetland and riparian habitat where ditches are proposed for abandonment or for buried pipe installation. The amount of mitigation necessary is based on a habitat evaluation performed in the Project Area (see Section 3.5 and Attachment E). Habitat replacement activities would involve ongoing work at a Habitat Replacement Site located approximately 3.5 miles south-by-southeast of the pipeline component of the Project on Hart Ranch (Figures 3 and 4). Hart Ranch is protected by a perpetual conservation easement and the landowner has entered into agreements with the Company for construction and maintenance of the Habitat Replacement Site. Partial construction of the Habitat Replacement Site has already occurred because the Habitat Replacement Site also provides mitigation for Clipper Irrigation Salinity Control Project 4, an earlier salinity reduction project funded by Reclamation on a different part of the Crawford Clipper Ditch System. The Reclamation-approved Habitat Replacement Plan is included in its entirety as Attachment F. The Final EA and FONSI for the Clipper Irrigation Salinity Control Project 4 are published on Reclamation's website (Reclamation 2014a, 2014b).

Habitat replacement activities that have already occurred at the Habitat Replacement Site (as part of the habitat loss mitigation for Clipper Irrigation Salinity Control Project 4) include clearing of cattails and excavation or deepening of pothole ponds at the "CDOT Ponds" area of the Habitat Replacement Site and installation of water control structures. Ongoing work would include clearing of cattails at the Tower Pond area of the Habitat Mitigation Site and plantings of native woody riparian and mesic vegetation in both the Tower Pond and CDOT Ponds areas to increase species diversity and structural diversity at the Site. Woody plantings would include species such as 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 also 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 D) and the State of Colorado. Habitat replacement activities would generally take place during spring or fall, and would be ongoing as necessary to maintain the Habitat Replacement Site for a duration of 50 years.

# 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 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 and environmental consequences predicted under the No Action and Proposed Action Alternatives. This section is concluded with a summary of impacts and environmental consequences.

## 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 Crawford Clipper Ditch Company is a privately owned, non-profit, mutually-funded irrigation company incorporated and operating in Delta County since 1885.

According to the Colorado Department of Natural Resource's Division of Water Resources, the Crawford Clipper Ditch Company holds several absolute decreed water rights totaling 164.3 cubic foot per second (cfs), most of which were appropriated between 1884 and 1930. A stock right of 10 cfs was appropriated in 1883 for use during the non-irrigation season. The total average rate of annual diversions of irrigation water through the Crawford Clipper Ditch system (including direct diversion from the Smith Fork River and water called from Crawford Reservoir) is approximately 18,000 acre-feet. The irrigation season is approximately 173 days long, and approximately 3,480 acres of hay crops and pasture are irrigated with the system.

Irrigation is primarily accomplished by flood methods directly from ditch laterals, and to a lesser extent with gated pipe and sprinklers. The system also carries winter stock water during the non-irrigation season for an annual average of 190 days.

The Zanni Lateral is part of the Crawford Clipper Ditch system. The system which originates at a head gate on the Smith Fork River at a location just south of the Town of Crawford, and provides users with irrigation water and winter stock water across Crawford and Spurlin Mesas. Late season water called from Crawford Reservoir is also delivered in the Crawford Clipper Ditch system. The Zanni Lateral is diverted from the system at the Crawford divider headgate (aka "The Mill") in the Town of Crawford, near the intersection of Colorado Highway 92 and Dogwood Avenue.

The Zanni Lateral conveys an average of 5.94 cfs daily for a total average of 2,055 acre-feet during irrigation season. During winter, the Zanni Lateral conveys an average of 1 cfs daily of stock water for a total of approximately 380 acre-feet.

> 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 capacity of the Zanni Lateral would be maintained. 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. There would be no new depletions or water storage associated with the piping project. 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 selenate, 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 North Fork and Smith Fork drainages of the Gunnison River watershed. The Gunnison River is a major tributary of the Colorado River in west-central Colorado.

The water supplying the Company's irrigation system originates from the Smith Fork River in the Middle Smith Fork unit (Hydrologic Unit Code [HUC] 140200021205) to the east, and from the Crawford Reservoir unit (HUC 140200021204) to the south (Figure 5). Both of these HUCs are in the Smith Fork of the Gunnison River drainage.

The pipeline component of the Proposed Action Area lies in the Cottonwood Creek unit (HUC 140200040504) tributary to the North Fork of the Gunnison River (Figure 5). The Habitat Replacement component of the Proposed Action lies in the Iron Creek unit (HUC 140200021203), tributary to Crawford Reservoir and ultimately to the Smith Fork River (Figure 5).

Unnamed tributaries to Cottonwood Creek receive irrigation runoff from farmlands irrigated by the Zanni Lateral. The Habitat Replacement Site is located on Alkali Creek and an unnamed tributary to Alkali Creek, both seasonal drainages ultimately flowing to Crawford Reservoir.

Official designated uses for the Smith Fork River include coldwater aquatic habitat, recreation, water supply, and agriculture. Official designated uses for Crawford Reservoir, Cottonwood Creek, and most Smith Fork tributaries not on the Gunnison National Forest (including Alkali Creek) are warmwater aquatic habitat, recreation, water supply, and agriculture (CDPHE 2009, 2013).

Currently, none of the hydrologic units named above are on the Colorado Department of Public Health and Environment's (CDPHE's) list of water quality 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.

The hydrologic units in the Proposed Action Area were previously on the state's list of impaired waters due to their failure to meet selenium standards. In instances where waterbodies fail to support classified uses and/or fall within assigned numeric water quality standards, a Total Maximum Daily Load (TMDL) is used to determine the maximum amount of pollution which can be introduced into a waterbody daily while still keeping that waterbody and downstream waterbodies within the limits of the numeric water quality standard. Selenium TMDLs for the area's waterbodies were assessed in 2011 by the CDPHE (CDPHE 2011), resulting in the removal of the waterbodies from the impaired waters list.

No Action: Under the No Action Alternative, the estimated 551 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 551 tons per year, at a cost-effectiveness value of approximately $86.51 per ton (as per the Funding Application). 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 Cottonwood Creek, and in the North Fork, Gunnison, and Colorado rivers. No change in water quality would occur to the Smith Fork River or Crawford Reservoir (the source of irrigation water upgradient of the pipeline component of the Project, and the location of the Habitat Replacement Site). 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). Water quality construction BMPs and permanent stabilization and revegetation of filled ditches, along with proper sizing of culverts for road crossings, would be environmental commitments for the Proposed Action. Exemptions from Section 404 of the Clean Water Act apply to the Proposed Action, and are verified in writing by the U.S. Army Corps of Engineers (see Attachment C); 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. Both Delta and Montrose counties are 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 Zanni Lateral 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 and vehicle exhaust 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 or less than those currently occurring for the existing ditch alignment. Impacts to air quality from routine maintenance include dust and vehicle exhaust from occasional travel in light vehicles along the Project corridor.

## 3.4 Access, Transportation, & Public Safety

The major public transportation resource in the Proposed Action Area is Colorado State Highway 92 (Figures 3 and 4), which roughly parallels the pipeline component of the Proposed Action in and northwest of the Town of Crawford in Delta County. Crawford Road, a paved Delta County Road off Highway 92, runs north-south through the west part of the Proposed Action Area (Figure 4). J Street, a gravel Delta County road, leads to Borrow/Staging Site #1 (Figure 4). Borrow/Staging Site #2 is accessed directly from Crawford Road (Figure 4). Borrow/Staging Site #2 is on Company land, and accessed via a private dirt road off Dogwood Avenue in Crawford (Figure 4). A private spur road off J Street leads to Borrow/Staging Site #4. Several local private driveways off Highway 92 exist along the pipeline route. The Habitat Replacement Site is accessed via private roads on Hart Ranch. These roads provide access and mobility for residents traveling in and out of the area. The Delta County Sheriff, Montrose County Sheriff, the North Fork Ambulance Service, and the North Fork Volunteer Fire Department cover the Proposed Action Area.

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 (namely Highway 92, Crawford Road, J Street, and Dogwood Avenue) connecting directly to the Project area or to existing private roads on private lands. All landowners with private roads that will be used to access the Project have given permission to the Company to access the Proposed Action Area. 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 public roadways and private driveways adjacent to the Project area from construction vehicles entering and exiting the local roadways. One buried pipeline crossing of Colorado Highway 92 and one buried crossing of Crawford Road are proposed for the Project. The Highway 92 crossing will be a slip culvert crossing (in an existing culvert) through a highway right-of-way administered by the Colorado Department of Transportation (CDOT). The Crawford Road crossing will be a bored pipeline crossing through a right-of-way administered by Delta County. Permits and traffic control for the road crossings are being coordinated with CDOT and Delta County. Road closures are not anticipated to be necessary, but would be coordinated with CDOT, Delta County, and local law enforcement and emergency services to ensure public safety.

## 3.5 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 replaced with buried pipe, and ditch alignments to be decommissioned by backfilling. Temporary, reclaimable disturbances of upland vegetation or irrigated lands would occur along the construction alignment and at borrow and staging areas. 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."

Figure 6 shows the general landcover types in the Proposed Action Area. These include irrigated agricultural (hayfields and/or pastures), Colorado Plateau pinyon pine-Utah juniper woodlands, Intermountain basins big sagebrush shrublands, mixed salt-desert scrub, and shale badlands. Proposed staging and borrow areas are all existing disturbed areas, except for a portion of Borrow/Staging Sites # 1 and 4, which are mostly in salt-desert shrub vegetation (primarily shadscale shrublands with a very sparse understory).

Within the matrix of the general landcover types (Figure 6), the existing ditch alignments are vegetated mostly with coyote willow, cattails, and occasional mature narrowleaf cottonwoods, but also include three-leaf sumac, wild rose, Russian olive, and isolated pockets of sedges. Stands of common ruderal and noxious weeds along the ditch include Canada thistle, milkweeds, chicory, and lambsquarters. These weeds are common and widespread in the region.

The landcover types described above provide habitat for an array of wildlife (described in Section 3.5).

A habitat evaluation was performed for the Proposed Action Area by Wildlife & Natural Resource Concepts & Solutions, LLC (Zeman 2015a) to quantify potential wetland and riparian habitat values that would be lost in the Proposed Action Area due to Project implementation (Attachment E). The evaluation followed methodology outlined in Reclamation's March 2013 "Basinwide Salinity Control Program: Procedures for Habitat Replacement." Table 1 summarizes the results of the habitat evaluation. Study segments are mapped in Attachment E.

**Table 1. 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 | Forest/Shrub-over pipe | 904 | 20 | 0.42 | 0.10 | 0.04 |
| H2 | Forest/Shrub | 1008 | 20 | 0.46 | 0.80 | 0.37 |
| H3 | Grass/Shrub | 990 | 40 | 0.91 | 0.50 | 0.45 |
| H4 | Grass/Shrub | 427 | 25 | 0.25 | 0.30 | 0.07 |
| H5 | Grass/Shrub | -- | -- | 1.46 | 1.40 | 2.04 |
| H6 | Forest/Shrub | 827 | 30 | 0.57 | 0.90 | 0.51 |
| H7 | Shrub/Grass | 1519 | 20 | 0.70 | 0.40 | 0.28 |
| H8 | Shrub/Grass | 1041 | 20 | 0.48 | 0.70 | 0.33 |
| H9 | Forest/Shrub | 655 | 20 | 0.30 | 0.60 | 0.18 |
| H10 | Forest/Shrub | 530 | 20 | 0.24 | 0.50 | 0.12 |
| H11 | Grass/Shrub | 507 | 40 | 0.47 | 0.00 | 0.00 |
| H12 | Grass/Shrub | 1034 | 40 | 0.95 | 0.00 | 0.00 |
| H13 | Grass Pasture | 448 | 40 | 0.41 | 0.00 | 0.00 |
| BSS#1 | Arid Grass/Forb | -- | -- | 3.68 | 0.30 | 1.10 |
| BSS#2 | Arid Grass/Shrub | -- | -- | 0.99 | 0.00 | 0.00 |
| BSS#3 | Grass/Shrub | -- | -- | 0.44 | -0.20 | -0.09 |
| | | **Totals** | | **12.72** | | **5.43** |

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, presence of native vs. non-native vegetation, 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 12.72 acres of wetland or riparian habitat (equating to a total wetland and riparian habitat value of 5.43 units based on Habitat Quality Scoring) were identified adjacent to or associated with the existing structures involved in the Proposed Action (Attachment E).

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. 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. Following surface disturbance of the wetland and riparian habitat, appropriate reclamation procedures would be followed in order to revegetate disturbed areas as uplands while controlling noxious weed infestations. Proposed buried pipe alignments through upland vegetation communities would temporarily affect those communities until

they are reseeded to appropriate grasses and forbs and eventually recolonize as shrublands or woodlands. Irrigated areas would be returned to production immediately following construction.

The total amount of riparian and wetland habitat anticipated to be permanently affected in the Proposed Action Area is estimated at 12.72 acres, with a total estimated habitat value of 5.43 units (see Attachment E). A Reclamation-approved Habitat Replacement Site (Zeman 2015b) to mitigate these losses has been established on private property on Hart Ranch about 3.5 miles southeast of the Proposed Action Area (see Attachment F and Section 4.6 for details). The habitat replacement project is predicted to create 15.65 habitat units. Of the 15.65 habitat units, 9.99 habitat units would be used to offset habitat loss occurring from the Clipper Irrigation Salinity Control Project 4. The Proposed Action would require 5.34 habitat units to offset habitat loss. The Company would have an additional 0.14 habitat units available for future projects. In the event Borrow/Staging Site #4 is needed to complete the Proposed Action, the remaining 0.14 habitat units will be utilized to mitigate habitat impacts associated with Site #4. Under this scenario, no additional habitat units at this site would be 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 would be implemented according to right-of-way agreements with landowners, using an appropriate Reclamation-approved seed mix. Noxious weed control would be implemented according to County standards (Attachment D).

The Company consulted with the U.S. Army Corps of Engineers regarding both the pipeline component and habitat replacement component of the Proposed Action and received written concurrence that the Proposed Action meets Clean Water Act agricultural exemption requirements (Attachment C).

## 3.6 Wildlife Resources

In the Proposed Action Area, ditches provide riparian and wetland habitat within a matrix of native upland vegetation and irrigated hay meadows (Section 3.5). 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 Proposed Action Area (mostly irrigated lands) as elk severe winter range (Figure 7). A mule deer resident population area and severe winter range is mapped across the entire Proposed Action Area, and general concentration area is mapped across the pipeline component of the Proposed Action Area (Figure 8). CPW also describes the Proposed Action Area as winter foraging range for bald eagle (Figure 9), and within overall range of black bear and mountain lion (CPW 2014).

Migratory birds of conservation concern protected under the Migratory Bird Treaty Act (FWS 2015) potentially habitat in the Proposed Action Area and the immediate vicinity. These include bald eagle (winter foraging range), Brewer's sparrow (breeding), brown-capped rosy finch (year-round), Cassin's finch (year-round), ferruginous hawk (wintering), fox sparrow (breeding), golden eagle (year-round), juniper titmouse (year-round), Lewis's woodpecker (year-round), loggerhead shrike (breeding), olive-sided flycatcher (breeding), Peregrine falcon (breeding),

pinyon jay (year-round), prairie falcon (year-round), sage thrasher (breeding), short-eared owl (wintering), Swainson's hawk (breeding), veery (breeding), and willow flycatcher (breeding). No raptor nests were identified in the Proposed Action Area during a September 2015 field visit.

No Action: Under the No Action Alternative, terrestrial wildlife habitat would remain in its current condition, and no displacement of wildlife would occur. Salinity and selenium 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 winter through early spring while construction is underway. Big game wintering habitat in the vicinity of the Proposed Action Area is extensive, and big game species have the ability to move away from disturbances to other suitable areas.

Direct impacts to migratory bird species of concern would include minor short-term disturbance and displacement during construction. Construction would occur during the irrigation off-season between Winter 2015 (December) through early Spring 2016 (early April), outside the typical nesting season. Wintering birds are not expected to be affected because wintering habitat in the vicinity of the Proposed Action Area is extensive, and is not exceptional in the Proposed Action Area compared to surrounding areas. Wintering birds have the flexibility to move away from disturbances to other suitable areas.

Direct 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 3.6. The total habitat value that would be lost long-term would be mitigated through the establishment of the Reclamation-approved Habitat Replacement Site (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 2.2 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.

## 3.7 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 2 summarizes the federally-listed species that may occur within or near the Proposed Action area (FWS 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 the table.

Greenback cutthroat trout is not considered further in this analysis because of the lack of suitable habitat onsite or downstream of the Proposed Action. Colorado hookless cactus is not considered further in this analysis because although its documented range is in western and central Delta County, the Proposed Action area vicinity has no documented occurrences of Colorado hookless cactus. No Colorado hookless cacti were observed in potentially suitable habitat (semi-desert saltbush shrublands) within the Proposed Action Area during a site visit. The nearest known population of Colorado hookless cactus to the Proposed Action Area is approximately 18 miles away, on the south slope of Redlands Mesa, northwest of the Town of Hotchkiss in Delta County (observed by the preparer of this EA).

Unless otherwise specified, all information related to the species below was obtained from resources available on FWS' Environmental Conservation Online System (ecos.fws.gov).

**Table 2. 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 *Centrocercus minimus* | Threatened | Requires large contiguous patches of sagebrush (>200 acres) with an abundant/tall herbaceous understory, interspersed with wet swales. The Proposed Action Area contains elements of suitable habitat for sage-grouse, but current documented occupied range is not within the Proposed Action Area. The Habitat Replacement Site lies in critical habitat but is excluded from the designation under the rule because it is on land that was encumbered by a conservation easement prior to August 28, 2013. | Historic range only | Habitat Replace-ment Site lies in unoccupied overall range |
| Mexican spotted owl *Strix occidentalis lucida* | 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 *Coccyzus americanus* | 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) 8 miles north and northwest of the Project area almost annually since 2003. Habitat in the Project area is not suitable for nesting. | Yes | Peripheral only |

| Common Name | Status | Habitat Requirement Summary | Range in Project Area? | Habitat in Project Area? |
|---|---|---|---|---|
| ***FISHES*** | | | | |
| Greenback cutthroat trout *Oncorhynchus clarkia stomias* | 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, (there are no perennial coldwater streams in project area) |
| Bonytail *Gila elegans*<br>Colorado pikeminnow *Ptychocheilus lucius*<br>Humpback chub *Gila cypha*<br>Razorback sucker *Xyrauchen texanus* | 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 for agricultural irrigation. | No | No, but critical habitat is down-stream |
| ***PLANTS*** | | | | |
| Colorado hookless cactus *Sclerocactus glaucus* | Threatened | Known range limited to alluvial river terraces and Mancos Shale formation of the Gunnison River valley from near Delta, Colorado, to southern Mesa County, Colorado; and alluvial river terraces of the Colorado River and in the Plateau and Roan Creek drainages in the vicinity of DeBeque, Colorado. Plant associations include semi-desert shrublands, big sagebrush shrublands, and sagebrush-juniper woodland transition areas. None observed during inspection of project area. | No | -- |

The Gunnison sage-grouse was listed as threatened, and critical habitat was designated in 2014. The Gunnison sage-grouse is a sagebrush obligate species 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 Crawford area sage-grouse population was estimated at 157 birds in 2014 (Nathan Seward, CPW, pers. comm.).

In designating critical habitat for Gunnison sage-grouse, FWS identified physical and biological features of habitat essential to conservation of the species—Primary Constituent Elements (PCEs)—that describe the landscape specific and seasonally specific characteristics necessary to provide for the species' life-history processes (see the critical habitat ruling at 79 FR 69311-69363). All areas designated as occupied critical habitat meet the landscape specific PCE 1, and one or more of the seasonally-specific PCEs (2 through 5), summarized as follows: PCE 1 specifies that suitable patches of sagebrush are part of an extensive sagebrush landscape composed primarily of sagebrush plant communities with at least 25 percent of the land dominated by sagebrush cover within a 0.9-mile radius of any given location. PCE 2 specifies structural requirements for breeding habitat in terms of height and canopy cover of sagebrush and understory vegetation. PCE 3 specifies summer-late fall sagebrush habitat structural requirements, and PCE 4 specifies winter habitat structural requirements. PCE 5 is an alternative mesic habitat component, used primarily in the late summer and early fall seasons for brood rearing, and includes riparian communities, springs, seeps, and mesic meadows (including irrigated hay meadows).

The pipeline component, borrow, and staging areas of the Proposed Action are not within occupied range or designated critical habitat for Gunnison sage-grouse (Figure 10), and lack habitat elements or PCEs necessary to support sage-grouse.

The Habitat Replacement Site associated with the Proposed Action Area is located in designated critical habitat for Gunnison sage-grouse outside of the species' current occupied range (Figure 10). However, the Site is excluded from the critical habitat designation under the critical habitat ruling because the property in which it lies was encumbered by a perpetual conservation easement prior to August 28, 2013 (79 FR 69311-69363). The Habitat Replacement Site is cumulatively about 10 acres within a matrix of irrigated hay meadows in the Alkali Creek drainage. As such, it represents the PCE 5 component of sage-grouse critical habitat. The nearest sagebrush patch of significance is about a quarter to half-mile east of the Habitat Replacement Site (Figure 6), and although it may meet the landscape-scale requirements of PCE 1, it currently only marginally meets any of the seasonally-specific requirements for PCEs 2 through 4, due to lack of sufficient herbaceous understory, pinyon-juniper encroachment, extensive gullying, and inconsistency in sagebrush canopy cover. With only marginally suitable sagebrush habitat nearby, the Habitat Replacement Site is unlikely to provide seasonal alternative mesic habitat (PCE 5) to sage-grouse.

According to CPW (Nathan Seward, pers. comm.), the closest recent confirmed Gunnison sage-grouse occurrence location (a telemetry detection possibly of a bird transplanted from the Gunnison population) is approximately 1 mile west of the Habitat Replacement Site, the nearest mapped occupied habitat lies 2.25 miles southwest, and the closest documented active lek (breeding ground) is approximately 4 miles south-by-southwest of the Habitat Replacement Site, all on Fruitland Mesa. Gunnison sage-grouse make relatively large movements on a seasonal basis and it is moderately feasible that the birds could move into the vicinity of the Habitat Replacement Site at any time. However, given the barriers to crossing between the Site and occupied range such as large blocks of pinyon-juniper woodlands and deep gullies and canyons, and given the unsuitability of nearby sagebrush patches to the seasonal requirements of sage-grouse, it is unlikely the Habitat Replacement Site would become occupied by sage-grouse in the near future.

The Mexican spotted owl was listed as threatened in 1993 and critical habitat was designated in 2004 (FWS 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 18 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 8 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 (Figure 10). 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 FWS 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 the Smith Fork River, 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 total average rate of annual diversions of irrigation water through the Crawford Clipper Ditch system (including direct diversion from the Smith Fork River and water called from Crawford Reservoir) is approximately 18,000 acre-feet, for irrigation of approximately 3,480 acres of hay crops and pasture. This average annual diversion rate, and the resulting water depletions in the greater Colorado River basin as a result of consumptive use, would 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 for the Proposed Action Area in Fall 2015, and used by Reclamation as a background document for a Section 7 ESA consultation with FWS. The results of the consultation will be provided in Attachment G of the Final EA. The determination of effects set forth in this EA on listed species and their critical habitats are based on the Section 7 ESA consultation, as follows:

- **Gunnison Sage-Grouse**. The pipeline component of the Proposed Action area lies outside current and historic range of the threatened Gunnison sage-grouse. The Habitat Replacement Site associated with the Proposed Action area lies within unoccupied historic range of the threatened Gunnison sage-grouse. The Habitat Replacement Site could potentially provide late summer/early fall brood rearing habitat for sage-grouse. Given that the habitat for Gunnison sage-grouse in the vicinity of the Habitat Replacement Site is currently unoccupied by the species, and given that the construction and maintenance of the Habitat Replacement Site are not occurring in breeding, nesting, or wintering habitat for the species, and given that similar brood-rearing habitat is extensively available in the immediate area, it is expected that the Proposed Action would have no effect on Gunnison sage-grouse. If construction and planting activities at the Habitat Replacement Site will occur during late Summer or early Fall 2016 or late summer/early fall in following years, it is recommended that Company/Reclamation contact FWS and CPW terrestrial biologists prior to construction to confirm the Proposed Action Area remains unoccupied by the species, and that a documented active lek does not lie within 0.6 mile of the Habitat Replacement Site.

- **Gunnison Sage-Grouse Critical Habitat**. The Habitat Replacement Site associated with the Proposed Action lies generally within mapped Gunnison sage-grouse critical habitat (Figure 10), however the Habitat Replacement Site is excluded from the critical habitat designation under the critical habitat ruling because it lies on land encumbered by a conservation easement prior to August 28, 2013. Therefore, it is expected that the Proposed Action would have no effect on Gunnison sage-grouse critical habitat. Nevertheless, the irrigated hay meadows around the vicinity of the Habitat Replacement Site, together with a large patch of sagebrush shrublands in unoccupied critical habitat about a half mile to the east, meet the landscape Primary Constituent Element 1 (PCE 1) and alternative mesic habitat PCE 5 in the critical habitat ruling. The Habitat Replacement Site, although excluded from designated critical habitat under the ruling, still provides potential late summer/early fall brooding habitat for sage-grouse, given the proximity of the large sagebrush patch to the east.

The Habitat Replacement Site would be temporarily disturbed by the Proposed Action where improvement of Tower Pond and plantings of riparian vegetation at both the CDOT Ponds and Tower Ponds areas would occur. Plantings of riparian woody vegetation could potentially improve sage-grouse brooding habitat at the site, provided that the woody vegetation does not eventually provide perches for predatory raptors. CPW recommends that strawberry clover (*Trifolium fragiferum*), a beneficial plant for sage-grouse, be included in any seed mix for mesic or upland areas of the Habitat Replacement Site, and that woody vegetation plantings be limited to shrubs, since taller species (cottonwoods) could provide perches for predatory raptors (Nathan Seward, pers. comm.).

- **Mexican Spotted Owl**. The Proposed Action Area lies within potential peripheral range of the threatened Mexican spotted owl; however, the Proposed Action Area does not encompass suitable breeding habitat. No breeding habitat loss for this species will occur as a result of the Proposed Action. An occurrence of a Mexican spotted owl in the Proposed Action Area would be considered a rare incidental dispersing individual. Based on these findings, the Proposed Action is expected to have no effect on Mexican spotted owl.

- **Mexican Spotted Owl Critical Habitat**. The Proposed Action does not lie within Mexican spotted owl designated critical habitat. Therefore, it is expected that the Proposed Action would have no effect on Mexican spotted owl critical habitat.

- **Western Yellow-Billed Cuckoo**. The Proposed Action Area lies within seasonal peripheral range of the threatened western yellow-billed cuckoo; however, the Proposed Action Area does not encompass suitable breeding habitat. No breeding habitat loss for this species will occur as a result of the Proposed Action. Foraging or migrating individuals could occur incidentally in the Proposed Action Area; however, foraging or migrating habitat is not exceptional in the Proposed Action Area compared to surrounding areas. Based on these findings, it is expected that the Proposed Action may affect, but is not likely to adversely affect, western yellow-billed cuckoo.

- **Western Yellow-Billed Cuckoo Proposed Critical Habitat**. The Proposed Action Area does not lie within proposed critical habitat (Figure 10). Therefore, it is expected that the Proposed Action would have no effect on western yellow-billed cuckoo proposed critical habitat**.**

- **Colorado River Basin Endangered Fishes**. The Proposed Action Area does not lie within the ranges of the endangered Colorado pikeminnow, razorback sucker, humpback chub, and bonytail. Based on previously issued biological opinions that all depletions within the Upper Colorado River Basin may adversely affect the four fishes, it is expected that the Proposed Action may affect, and is likely to adversely affect, the Colorado pikeminnow, razorback sucker, humpback chub, and bonytail.

- **Colorado River Basin Endangered Fishes Critical Habitat**. Consumptive use of water in the Gunnison and Colorado River basins due to agricultural irrigation from the Crawford Clipper Ditch System (including the Zanni Lateral) results in an average annual depletion of approximately 5,776 acre-feet from the upper Gunnison River watershed, which affects downstream critical habitat for the endangered Colorado pikeminnow, razorback sucker, humpback chub, and bonytail. This average annual

depletion results from agricultural irrigation supplied by direct diversions from the Smith Fork and from water drawn from Crawford Reservoir. Reclamation is in the process of consulting with FWS on the Smith Fork diversion component of this annual depletion, and the results of this consultation (including a Recovery Agreement between FWS and the Company) will be included in the Final EA at Attachment G. Depletions originating from Crawford Reservoir for the entire Crawford Clipper Ditch System (including the Zanni Lateral) were previously determined to fall under the 2009 Gunnison Basin Programmatic Biological Opinion (PBO). The annual depletion rates due to operation of the ditch system are not expected to change as a result of the Proposed Action. Therefore, it is expected that the Proposed Action will not destroy or adversely modify the designated critical habitat for the Colorado River endangered fishes. Furthermore, the potential reduction in selenium loading to the Colorado and Gunnison river basins as a result of the cumulative efforts of the Colorado River Basin Salinity Control Basinwide and Basin States Programs improves water quality within designated critical habitat for the Colorado pikeminnow, razorback sucker, humpback chub, and bonytail throughout the Colorado and Gunnison river basins. Potential reductions in selenium loading to the Gunnison basin as a result of the Proposed Action would also contribute to the overall success of the Gunnison Basin Selenium Management Program (SMPW 2011).

## 3.8 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 the Fall of 2014 and 2015, Alpine Archaeological Consultants, Inc. (Alpine) conducted cultural resource inventories of irrigation features and areas slated for disturbance (Hoose 2015, Horn 2015). All proposed buried pipe alignments (including 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 the Zanni Lateral (site 5DT1811.3), two isolated finds (sites (5DT1997 and 5DT1998), and a small segment of the Aspen Canal (site 5DT1584.3), which intersects the Zanni Lateral. None of these sites were determined to be eligible for the National Register of Historic Places. No mitigation was recommended by Alpine as a result of the inventory.

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

Proposed Action: Reclamation received concurrence (Attachment H) from the Colorado State Historic Preservation Officer (Colorado SHPO) that the Proposed Action would have no adverse effect under Section 106 of the National Historic Preservation Act on the Zanni Lateral and other finds noted in the cultural resource inventory. No mitigation is warranted since the Zanni Lateral and other found resources are not recommended as eligible for the National Register of Historic Places.

## 3.9 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.

Four types of farmlands of national or statewide importance occur in the vicinity of the Proposed Action (Figure 11):

*Prime Farmland if Irrigated*. None of the irrigated lands affected by the Proposed Action are Prime Farmland if Irrigated. 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 850 linear feet of the proposed buried pipe alignment, and a small part of the Tower Pond area of the Habitat Replacement Site involves 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 2,900 linear feet of proposed buried pipe alignment, approximately 6 acres of borrow or staging sites, and the entire CDOT ponds area of the Habitat Replacement Site lie within 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. *A*ll the areas of Farmland of Unique Importance crossed by the of proposed buried pipe alignment are in irrigated hay meadows or pastures. The remainder is not in cultivated agricultural production.

*Farmland of Statewide Importance*. Approximately 2,000 linear feet of the proposed buried pipe alignment 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 175 linear feet of proposed pipeline alignment cross irrigated hay meadows in this farmland type. The remainder occurs on residential lands or directly adjacent to Highway 92.

Other soil units found in the vicinity of the Proposed Action Area (Figure 11) include 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 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. Livestock grazing on these lands could be disrupted during construction, but could resume immediately afterwards.

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 seed mixes in non-cultivated areas. Backfilled ditches and other disturbed areas would also be seeded with appropriate dryland cover species. A weed control program meeting Delta and Montrose County criteria would be implemented in all areas of surface disturbance (Attachment D).

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.

## 3.10 Cumulative Impacts

Cumulative impacts are direct and indirect impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Cumulative impacts can also be characterized as additive or interactive. An additive impact emerges from persistent additions from one kind of source, whether through time or space. An interactive—or synergistic—impact results from more than one kind of source.

The analysis of cumulative impacts for the No Action and Proposed Action Alternatives considers both spatial (geographic) boundaries and temporal limits of impacts, on a resource-by-resource basis. Spatial and temporal analysis limits vary by resource, as appropriate (see Table 3). Spatial analysis limits were selected to be commensurate with the impacts on, and realm of influence of, each resource type. The temporal limits of analysis were established as 50 years for each resource type (a standard timeframe for cumulative impacts analysis), except for resource types perceived to have only temporary impacts (impacts that end following construction of the Project or within a few seasons following construction).

**Table 3. Cumulative Impacts Analysis Spatial & Temporal Limits by Resource**

| Resource Issue | Spatial Limits of Analysis | Temporal Limits of Analysis |
|---|---|---|
| Water Rights and Use | Smith Fork River and North Fork River drainages | 50 years |
| Water Quality | Colorado River Basin | 50 years |
| Air Quality | Project Area plus 2-mile buffer | Duration of Project |
| Access, Transportation, & Public Safety | Project Area | Duration of Project |
| Vegetative Resources / Habitat | Smith Fork River and North Fork River drainages | 50 years |
| Wildlife Resources | Smith Fork River and North Fork River drainages | 50 years |
| Threatened and Endangered Species | Crystal Creek and Smith Fork River drainages, except for Gunnison sage-grouse, where the designated critical habitat is considered the spatial limit of analysis | 50 years |
| Cultural Resources | Smith Fork River and North Fork River drainages | 50 years |
| Agricultural Resources & Soils | Smith Fork River and North Fork River drainages | 50 years |

Effects of past actions are reflected in the current condition described in the affected environment in each of the resource topics of Section 3. Effects of present, and reasonably foreseeable future actions (planned actions or known proposals for actions in the spatial limits of analysis that would take place within the temporal limits of analysis shown in Table 3), are summarized in Table 4.

**Table 4. Cumulative Impacts Scenario**

| Resource Issue | Existing or Future Activities in the Limits of Analysis and their Contribution to Cumulative Impacts with the Proposed Action |
|---|---|
| Water Rights and Use | Irrigation water rights in the area will continue to be bought and sold in the future, and used for agricultural purposes. Due to future population growth and increasing subdivisions in the area, agricultural water rights may be converted to municipal or industrial uses. Ongoing and future projects sponsored by NRCS in the Project Area and the area of analysis can be reasonably expected to put irrigation water into sprinkler systems, which could impact irrigation wastewater rights of some downgradient users by reducing or eliminating historic irrigation wastewater runoff. The Proposed Action could indirectly affect wastewater irrigation practices downgradient of the Project Area because piping the ditch system would provide pressurized water that will likely lead to future sprinkler system installations. Sprinkler irrigation systems tend to improve on-property irrigation efficiency and reduce the amount of wastewater returning to ditch systems for downstream users. Lands irrigated solely with irrigation wastewater make up a relatively small proportion of irrigated agricultural lands in the area of analysis. The No Action Alternative would have no impact on water rights and water use in the area of analysis. |
| Water Quality | Three ongoing federal programs at a basin-wide scale are producing significant cumulative beneficial effects on water quality: the Colorado River Basin Salinity Control and Basin States Program, the Upper Colorado River Endangered Fish Recovery Program, and the Gunnison Basin Selenium Management Program. Collectively and cumulatively, projects funded under the Salinity Control and Basin States Program result in reduced salt loading in the Colorado River basin. The Recovery Program involves federal, state and private organizations and agencies in Colorado, Utah, and Wyoming, and is working for the benefit of four species of endangered fishes in the Colorado River and its tributaries while allowing water use and development to continue meeting human needs. 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, as a conservation measure required by the Gunnison Basin Programmatic Biological Opinion (FWS 2009). Under the No Action Alternative, water quality benefits (an estimated 551-ton salt loading reduction per year in the Colorado River basin) would not be realized by the Project. |

| Resource Issue | Existing or Future Activities in the Limits of Analysis and their Contribution to Cumulative Impacts with the Proposed Action |
|---|---|
| Air Quality | Air quality in the area of analysis is affected by vehicular traffic (exhaust gases and road dust), agricultural practices (exhaust gases from farm equipment, dust and smoke from harrowing and ditch/field burning), and occasional controlled burns, wildfires or dust storm events (either local, or blown in from distant locations with the westerly prevailing winds). Dust and exhaust gases related to construction of the Proposed Action and similar salinity or selenium control projects or NRCS irrigation projects are expected to be temporarily elevated in the Project Area and near the Project Area and east of the Project Area (influenced by the prevailing winds) for the short-term duration of construction. Because salinity and selenium control projects involve piping of open ditches, and buried pipe alignments require less maintenance than open ditch systems (would not require burning, re-digging, etc.), it is expected that the long-term cumulative impact of the Proposed Action and similar projects would be to reduce contributions of dust and exhaust gases to the atmosphere. Under the No Action Alternative, there would be no contribution to the cumulative impact on air quality in the area of analysis. |
| Access, Transportation, & Public Safety | Existing regional traffic in the Project Area is confined primarily to State Highway 92, a paved two-lane road. Local traffic in the Project Area travels on Town of Crawford paved roads, graveled county roads and private roads/tracks. Existing traffic includes local residents, regional travelers, and very few commercial vehicles. Highway 92 is used by regional travelers and locals to reach National Forest access roads to the south of the Project Area, and the Town of Hotchkiss north of the Project Area. Construction traffic related to the Project would primarily use Highway 92, Crawford Road, and J Street to reach the Project site. Private driveways could be temporarily blocked by construction traffic and other construction activities. Construction traffic could include heavy vehicles, wide loads, and heavy equipment moving at slow speeds. No new roads would be constructed for Project access, and existing roads would be restored to their current condition or better following construction. Traffic control and notification of emergency authorities would be implemented for road closures or as appropriate for wide, slow-moving loads. These effects would be temporary (approximately 6 months in duration) and would not contribute significantly to cumulative impacts on access, transportation, or public safety in the Project Area. Under the No Action Alternative, there would be no contribution to the cumulative impact on access, transportation, & public safety in the area of analysis. |

| Resource Issue | Existing or Future Activities in the Limits of Analysis and their Contribution to Cumulative Impacts with the Proposed Action |
|---|---|
| Vegetative Resources / Habitat | Present and future actions within the analysis area (Smith Fork River and North Fork River drainages) include infrastructure development and/or maintenance (including public and private roads, and maintenance of a high-voltage transmission corridor in the area of the Habitat Replacement Site), other salinity reduction and NRCS irrigation projects, timber harvest and vegetation management activities (such as sagebrush treatment projects on Fruitland Mesa by BLM), recreational hunting and outfitting, grazing, motorized recreation, firewood cutting, and subdivision and residential development (on Fruitland Mesa, within the Town of Crawford, and around Crawford Reservoir), and conversion of native shrublands and woodlands to agricultural uses. Drought and wildfire also will continue to affect the regions vegetative resources and natural habitat in the future, possibly with increasing intensity. The primary vegetation/habitat impact of the Project would be to convert approximately 12.72 acres of riparian and wetland habitat associated with the current ditch system to native upland types (shrublands and woodlands). Considering the habitat replacement site that will be implemented and maintained for 50 years to address the loss of riparian and wetland habitat on the Project's ditch alignments, the overall contribution of the Proposed Action to the cumulative effects on the vegetation and habitat in the analysis area are expected to be negligible. Other similar salinity reduction projects in the region are also required to establish habitat replacement sites to functionally replace riparian and wetland habitats affected by the projects. Under the No Action Alternative, there would be no contribution to the cumulative impact on vegetative resources in the area of analysis. |
| Wildlife Resources | Present and future activities in the analysis area affecting this resource are similar to those described for vegetative resources / habitat, above. The Project Area lies in elk severe winter range and mule deer concentration areas and year-round range. Movements and forage patterns of elk and deer would be temporarily disrupted during construction of the Project. However, deer and elk are widespread, relatively abundant, and readily disperse across the landscape in response to disturbance. The surrounding landscape is relatively open and natural, with ample opportunities for big game dispersal. Small mammals, herptiles, and migratory birds would be temporarily displaced during construction of the Project until revegetation is accomplished. Individual small burrowing mammals and herptiles could be harmed during construction. Migratory birds / overwintering birds are expected to disperse to other areas during construction; however, if construction activities extend into the nesting season of migratory birds, individual nests with eggs or young could be lost due to abandonment or direct mortality. The negative effects from the Project would be of short duration and magnitude, and would not result in a substantial contribution to cumulative area-wide impacts on population trends of wildlife. Impacts would be mitigated by design features and environmental commitments described elsewhere in this EA. Under the No Action Alternative, there would be no contribution to the cumulative impact on wildlife resources in the area of analysis. |

| Resource Issue | Existing or Future Activities in the Limits of Analysis and their Contribution to Cumulative Impacts with the Proposed Action |
|---|---|
| Threatened and Endangered Species & Critical Habitat | Present and future activities in the analysis area affecting this resource are similar to those described for vegetative resources / habitat, above. None of the ongoing or foreseeable future activities in this area, when combined with the Proposed Action, are likely to contribute to substantial negative long-term cumulative impacts to threatened and endangered species. Mexican spotted owl and yellow-billed cuckoo have only peripheral or marginally suitable habitat in the Project Area. Gunnison sage-grouse critical habitat is mapped in the Habitat Replacement Site for the Project Area, but the Site is excluded from the critical habitat definition. Additionally, the habitat is not occupied by sage-grouse. Impacts to habitat for sage-grouse in the Habitat Replacement Site would be short-term and temporary (until vegetation is established following construction). The Project and similar salinity and selenium control projects occurring in the area in the future are not expected to destroy or adversely modify downstream critical habitat for the four species of Colorado River endangered fishes, because the projects will not result in an increase in average annual depletion rates of water from the system. Under the No Action Alternative, there would be no contribution to the cumulative impact on threatened and endangered species or designated critical habitat in the area of analysis. |
| Cultural Resources | Cultural resources are defined as fragile and nonrenewable remains of prehistoric and historic human activity, occupation, or endeavor, as reflected in districts, sites, structures, buildings, objects, artifacts, ruins, etc. Significant cultural resources are eligible for listing in the National Register of Historic Places, are typically at least 50 years old, and meet other requirements specified at 36 CFR Part 60. The Zanni Lateral is a cultural resource that has been determined to be not eligible for inclusion on the National Register of Historic Places. Other salinity and selenium control projects in the area of analysis also will effect or have the potential to destroy cultural resources such as irrigation ditches and appurtenant structures. For significant resources, these effects are mitigated by Historic Resource Documentation at an appropriate level for the significance of the resource. For Projects with significant cultural resources, a Memorandum of Agreement (MOA) is executed between Reclamation and the State Historic Preservation Office to ensure proper documentation of the resource prior to its destruction. Under the No Action Alternative, there would be no contribution to the cumulative impact on cultural resources in the area of analysis. |

| Resource Issue | Existing or Future Activities in the Limits of Analysis and their Contribution to Cumulative Impacts with the Proposed Action |
|---|---|
| Agricultural Resources & Soils | Actions with potential for cumulative effects on soils and agricultural resources in the Smith Fork River and North Fork River drainages include existing and future Colorado River Basin Salinity Control Program projects, Gunnison Basin Selenium Management projects, existing and future NRCS irrigation improvement projects, infrastructure development, livestock grazing, and residential development. Each of these activities can result in soil erosion or degradation of soil health; however, erosion control and reclamation is required for most of these activities to reduce direct, indirect, and cumulative soils effects. Residential development can result in conversion of irrigated agricultural or grazing rangelands. The Project would not result in the direct loss of irrigated agricultural lands or grazing rangelands. An indirect effect of the Project and similar projects in the Salinity Control Program, is the possibility that the quantity of irrigation wastewater could diminish from irrigated areas that are converted to sprinkler irrigation following completion of the Proposed Action (in future unrelated projects), and that areas downgradient of the Proposed Action that are irrigated with wastewater may be converted to dryland agricultural uses or other uses. Lands irrigated solely with irrigation wastewater make up a relatively small proportion of irrigated agricultural lands in the area of analysis. Under the No Action Alternative, there would be no contribution to the cumulative impact on agricultural resources & soils in the area of analysis. |

## 3.11 Summary of Impacts

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

**Table 5. Summary of Impacts of the Zanni Lateral Pipeline Project**

| Resource Issue | Impacts | |
|---|---|---|
| | No Action Alternative | Proposed Action Alternative |
| Water Rights and Use | No Effect | No Effect or possible beneficial effect |
| 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 551 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. |
| Air Quality | No Effect | Minor short-term effects due to dust and exhaust created by construction equipment. |

| Resource Issue | Impacts | |
|---|---|---|
| | **No Action Alternative** | **Proposed Action Alternative** |
| Access, Transportation, & Public Safety | No Effect | Minor temporary disruptions to State Highway 92 and local public roadways from construction traffic entering and existing roadways. No long-term effects. |
| Vegetative Resources / Habitat | No Effect | Short-term impacts to vegetation where construction would occur in upland areas. Estimated long-term loss of 5.43 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 | Selenium loading from the Project area would continue to affect downstream critical habitat for endangered fishes. No effect to Gunnison sage-grouse. | The Habitat Replacement Site for the Proposed Action Area lies within designated critical habitat for Gunnison sage-grouse, but is excluded from the definition under the rule because it lies on land encumbered by a conservation easement. The Habitat Replacement Site does not lie within currently occupied range. Short-term reclaimable impacts would occur to potentially suitable habitat for sage-grouse. Water depletions (irrigation water consumption) would continue at historic levels from the Smith Fork drainage and Crawford Reservoir, and would adversely affect downstream designated critical habitat for the four Colorado River federally endangered fishes. Reclamation is in the process of consulting with FWS on depletions from the entire Crawford Clipper Ditch System (including the Zanni Lateral) originating from the system's diversion structure on the Smith Fork (depletions originating from Crawford Reservoir were previously determined to fall under the 2009 Gunnison Basin Programmatic Biological Opinion (PBO)). The annual depletion rate is not expected to change as a result of the Proposed Action. Therefore, it is expected that the Proposed Action will not destroy or adversely modify the designated critical habitat for the Colorado River endangered fishes. The Proposed Action would improve water quality by contributing to the reduction of selenium loading in the Gunnison and Colorado rivers. |

| Resource Issue | Impacts | |
|---|---|---|
| | **No Action Alternative** | **Proposed Action Alternative** |
| Cultural Resources | No Effect | Adverse effect to sites determined by a professional archaeologist to be not eligible for listing on the National Register of Historic Places. Because the sites are not considered culturally significant, no mitigation is recommended. |
| Agricultural Resources & Soils | No Effect | Short-term temporary effect during construction, with agricultural production and grazing 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. Indirect and direct contributions to cumulative effects on other resources are temporary and/or negligible, with consideration of mitigative measures (i.e., the habitat replacement site). |

# 4 ENVIRONMENTAL COMMITMENTS

This section discusses the environmental commitments 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 or endangered species, or migratory bird species.

The Final EA will include an Environmental Commitment Plan as Attachment I. The Plan will serve as a tool to help Reclamation and the Company comply with the environmental commitments set forth in the EA. The Plan will include a checklist that the Company will complete as each environmental commitment is fulfilled. The Company will be required to return the completed checklist the Reclamation upon the Project's completion.

## 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 3 and 4.

Environmental commitments regarding access will be included in CDOT and/or Delta County authorizations, and agreements with 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.

- 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 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 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 (including any borrow areas) necessary for completion of the work.
- Construction limits shall be clearly flagged onsite to avoid unnecessary plant loss or ground disturbance. The boundary between BLM land and Borrow/Staging Site #1 shall be clearly flagged so that Project activities do not encroach on adjoining BLM land.
- 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 within six months following construction completion with weed-free seed mixes per Reclamation specifications.
- Weed control shall be implemented by the Company or the Company's contractor in accordance with current County weed control standards (Attachment D).

## 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 4.11), 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 (Attachment F). The Habitat Replacement Site location is on Hart Ranch, about 3.5 miles south-by-southeast of the pipeline component of the Proposed Action (Figures 3 and 4). Habitat replacement activities to be performed as part of the Proposed Action are described in Section 2.2 of this EA.

The Habitat Replacement Plan meets the objectives of the Basin States 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. The Habitat Replacement Plan involves enhancing (improving the functions and values of) existing wetland areas on Hart Ranch. Habitat improvement activities do not involve placing fill in potentially jurisdictional wetlands, therefore no Section 404 permit from the U.S. Army Corps of Engineers would be required. 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 funding.

For all ground areas disturbed by the Proposed Action, a weed treatment program will be implemented to meet standards set by Delta or Montrose County, as appropriate, (Attachment D) and the State of Colorado.

## 4.7 Federally-Listed Species

The Habitat Replacement Site component of the Proposed Action is located in currently unoccupied range of the federally-listed Gunnison sage-grouse. If ground or vegetation-disturbing activities are to take place at the Habitat Replacement Site during the breeding or nesting periods of sage-grouse (March through September), the Company will contact FWS and CPW terrestrial biologists prior to construction to confirm the Proposed Action Area remains unoccupied by the species, and that a documented active lek does not lie within 0.6 mile of the Proposed Action. Because the Habitat Replacement Site is in potential Gunnison sage-grouse habitat that could become occupied in the future, the planned plantings for the site do not include tall trees, which could serve as perches for raptors that prey on sage-grouse.

Reclamation is in the process of consulting on Colorado River Basin water depletions caused by the Crawford Clipper Ditch System from direct diversions from the Smith Fork River, which affect downstream critical habitat for Colorado River Endangered fishes (see Section 3.7). The results of this consultation (a Recovery Agreement executed by FWS and the Company) will be

provided in Attachment G of the Final EA. Depletions caused by withdrawals from Crawford Reservoir were previously determined to be covered under the Gunnison Basin PBO.

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 FWS to ensure that adequate measures are in place to avoid or reduce impacts to the species.

## 4.8 Cultural Resources

Reclamation received concurrence (Attachment H) from the Colorado State Historic Preservation Officer (Colorado SHPO) that the Proposed Action would have no adverse effect under Section 106 of the National Historic Preservation Act on the Zanni Lateral and other finds noted in the cultural resource inventory. No mitigation is warranted since the Zanni Lateral and other found resources are not recommended as eligible for the National Register of Historic Places.

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.

## 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.

## 4.10 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 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.

- The construction contractor shall prepare, prior to initiation of construction, a spill response plan 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.

- 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 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.

## 4.11 Sequence and Timing of the Proposed Action

The Proposed Action would take place between Winter 2015 and Spring 2016 (during the irrigation off-season).

Vegetation-disturbing activities occurring during the nesting season of migratory birds (April through July) would require further conservation measures prior to initiation (i.e., nest surveys for migratory bird species of concern). Vegetation-disturbing activities occurring at the Habitat Replacement Site during breeding (March through May), nesting (April through June), or brood rearing (June through September) seasons for Gunnison sage-grouse, would require agency confirmation of sage-grouse non-occupancy prior to commencement of work.

- Construct buried pipe alignments outside the existing ditch prism (i.e., “overland” pipe alignments) prior to the 2016 irrigation season.

- Construct buried pipe alignments in or near the existing the existing ditch prism, to begin as soon as possible in the irrigation off-season, prior to the 2016 irrigation season.

- Decommission and backfill abandoned ditch and irrigation control structures and conduct final mop-up, prior to the 2016 irrigation season.

### 4.12 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:

- 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, if necessary, to be obtained by the construction contractor prior to working in the Colorado Highway 92 right-of-way.

- Traffic control measures, to be coordinated by the construction contractor with CDOT, Delta County Sheriff, and emergency services, prior to working in the Colorado Highway 92 right-of-way.

- Utility clearances, to be obtained by the construction contractor prior to construction activities from Delta Montrose Electric Association, TDS Telecom, local water companies, and any other utility in the area.

- Delta County clearance, to be obtained by the Company / construction contractor prior to crossing county roads 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.

## 5 CONSULTATION & COORDINATION

Reclamation’s consultation and coordination process presents other agencies, interest groups, and the general public with opportunities to obtain information about a given project and allows interested parties to participate in the project through written comments. The key objective is to facilitate a well-informed, active public that assists decision-makers throughout the process,

culminating in the implementation of an alternative. This section explains consultation and coordination undertaken for the Proposed Project.

## 5.1 Agency Consultation

This EA was prepared by Rare Earth Science, LLC, of Paonia, Colorado, for Reclamation and Crawford Clipper Ditch Company. The following local, state, and federal agencies were contacted and consulted in the preparation of this EA. Additional entities will be given the opportunity to comment during a public review period.

- 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
- Southern Ute Tribe, Ute Mountain Ute Tribe, and Ute Indian Tribe (Uintah and Ouray Reservation)

## 5.2 EA Comments

In compliance with NEPA, the Draft EA will be released for a 30-day public review period (via Reclamation's website at http://www.usbr.gov/uc/wcao/envdocs/index.html). Any comments received from the public, regulatory agencies, or other entities during the review period will be addressed in this section of the Final EA.

## 5.3 Distribution

Notice of the public review period and availability of the Draft EA (on Reclamation's website) will be distributed to Company shareholders, private landowners adjacent to the Proposed Action Area, and the organizations and agencies listed in Attachment B. The Final EA will also be available on Reclamation's website. Publicly-available electronic versions of the Draft and Final EA will meet the technical standards of Section 508 of the Rehabilitation Act of 1973, so that the documents can be accessed by people with disabilities using accessibility software tools.

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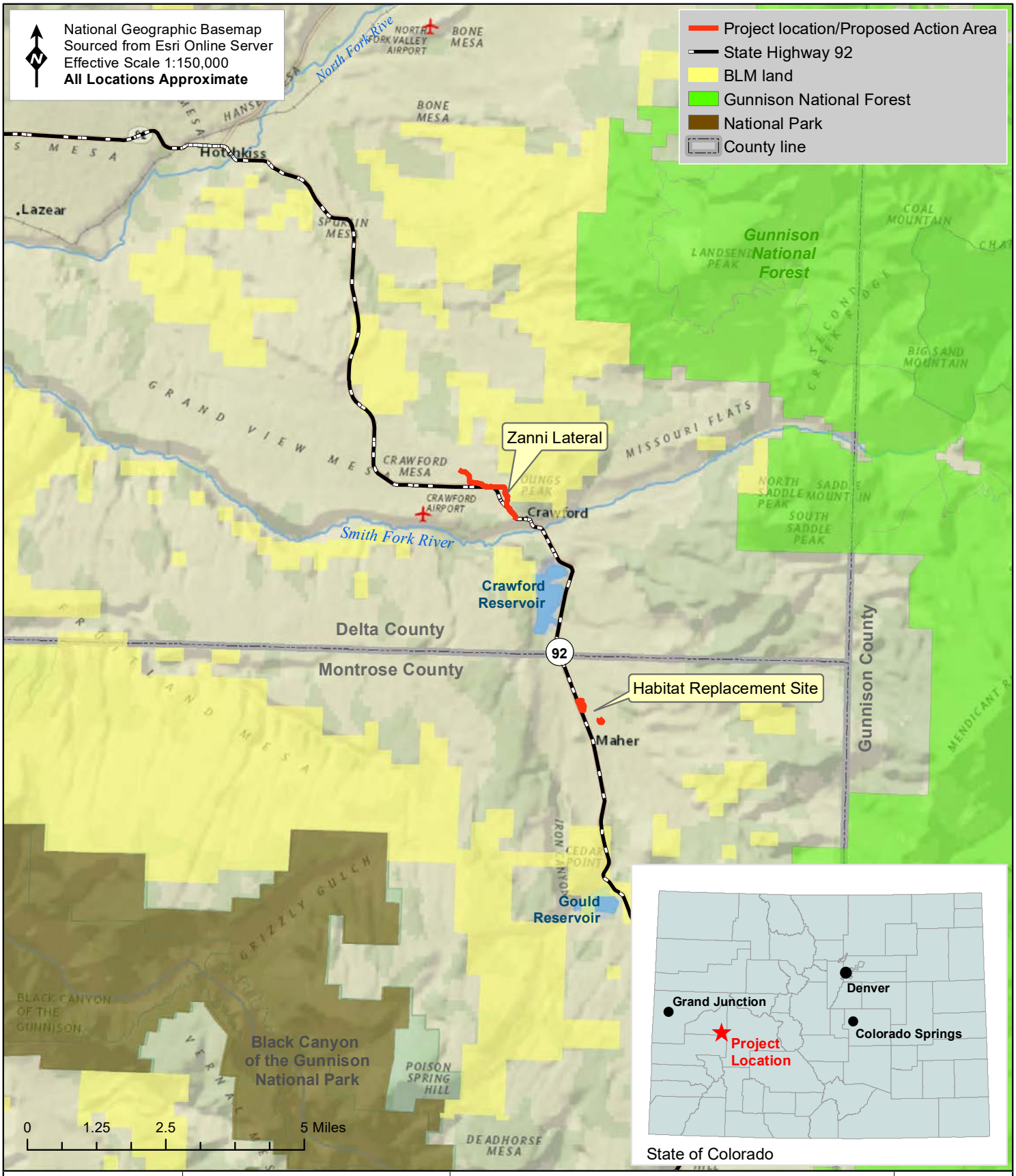
# FIGURES




DATE: October 2015

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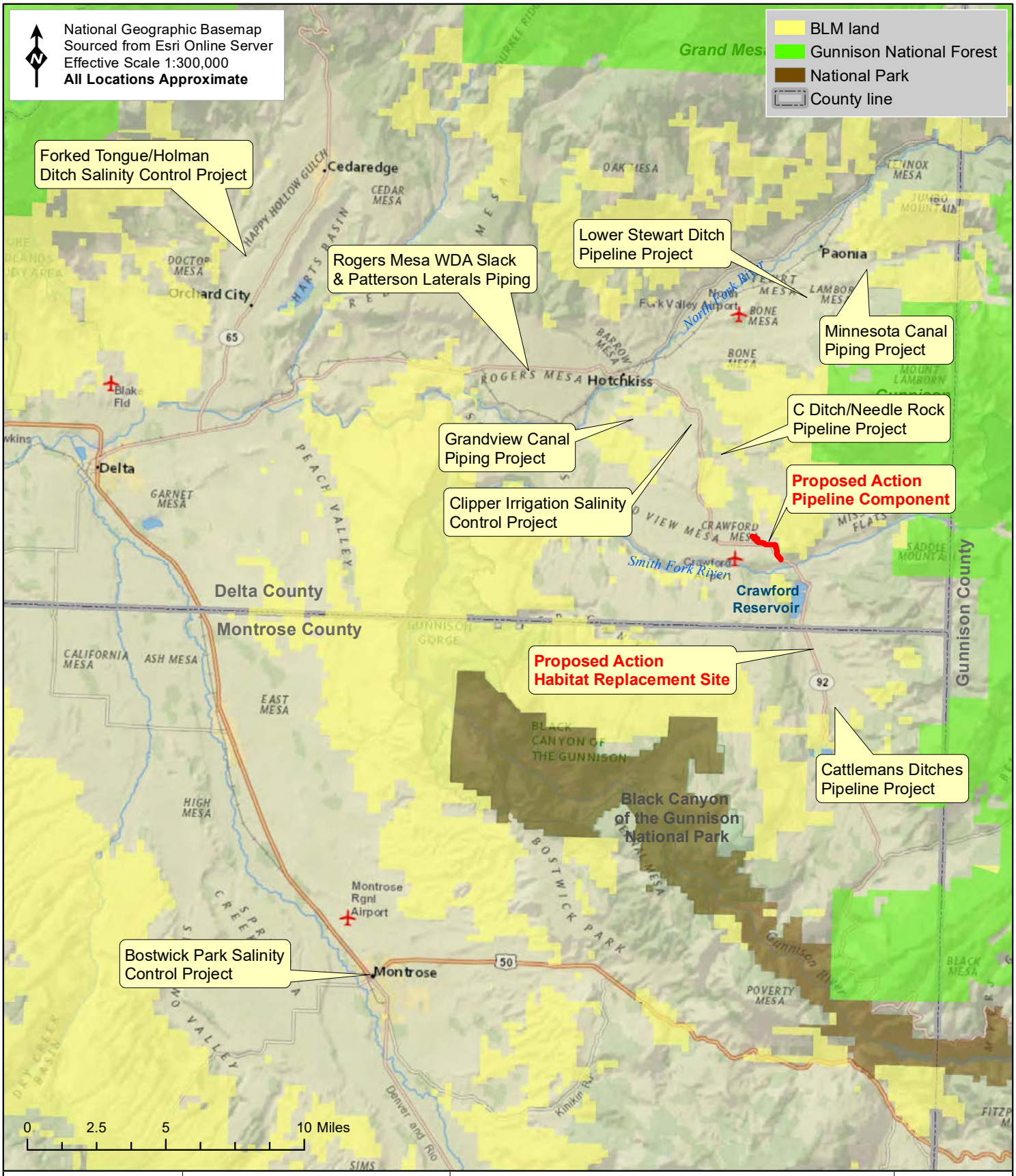
# REGIONAL & LOCAL LOCATOR MAPS

**ZANNI LATERAL PIPELINE PROJECT**
**ENVIRONMENTAL ASSESSMENT**
**Delta & Montrose Counties, Colorado**

**FIGURE 1**

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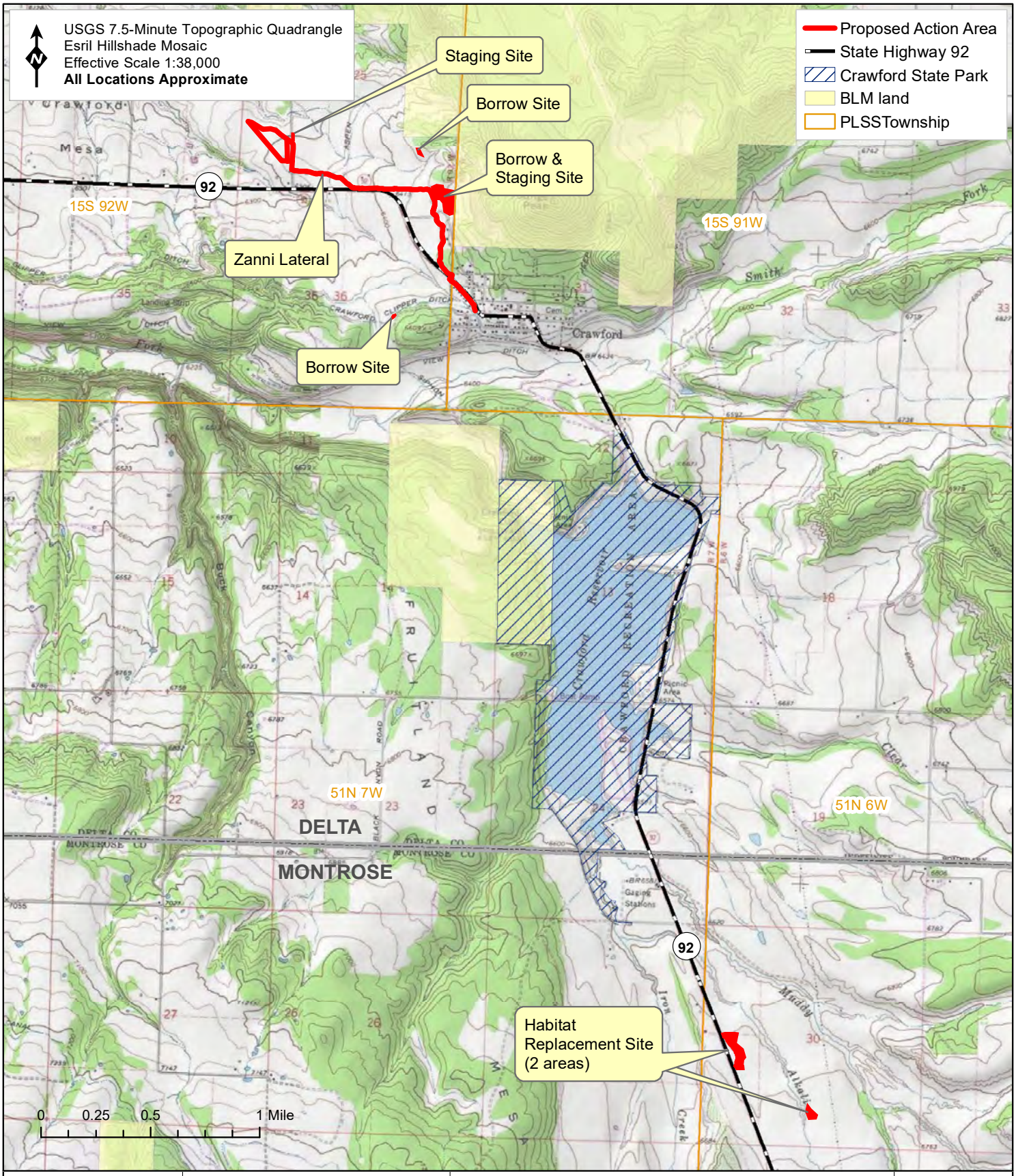
# RELATIONSHIP TO OTHER SALINITY CONTROL PROJECTS

**ZANNI LATERAL PIPELINE PROJECT**
**ENVIRONMENTAL ASSESSMENT**
**Delta & Montrose Counties, Colorado**

**FIGURE 2**

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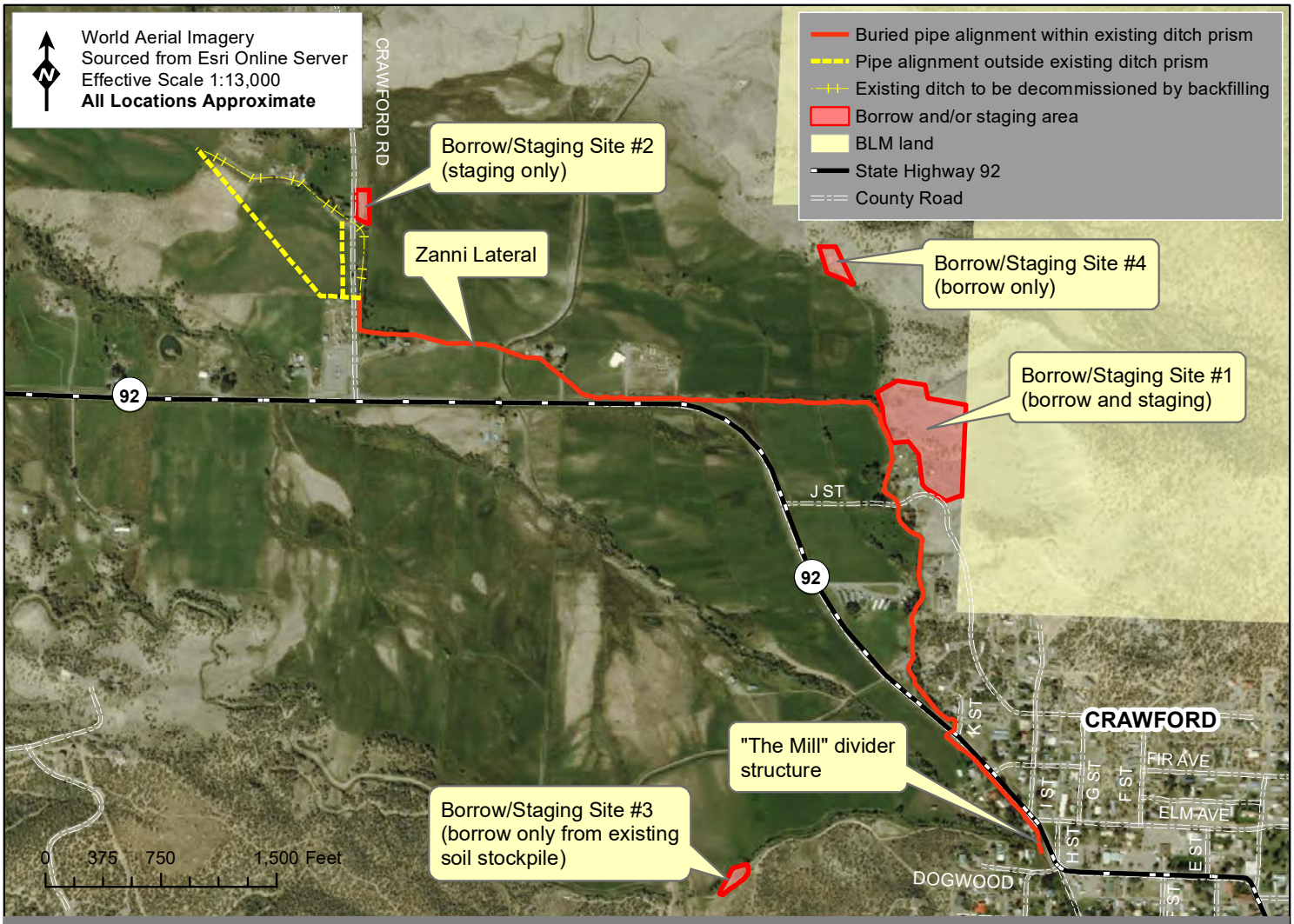
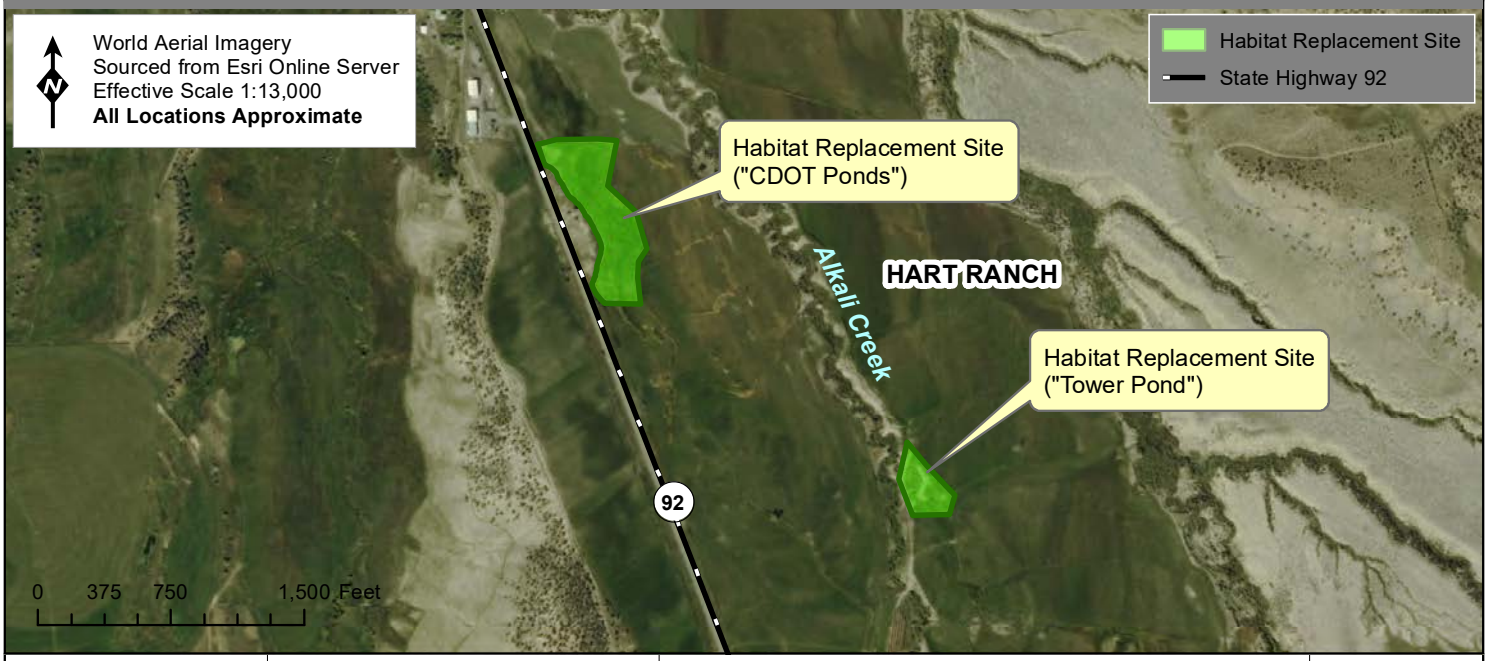
# TOPOGRAPHIC MAP WITH LAND STATUS & PROJECT AREAS

**ZANNI LATERAL PIPELINE PROJECT**
**ENVIRONMENTAL ASSESSMENT**
**Delta & Montrose Counties, Colorado**

**FIGURE 3**

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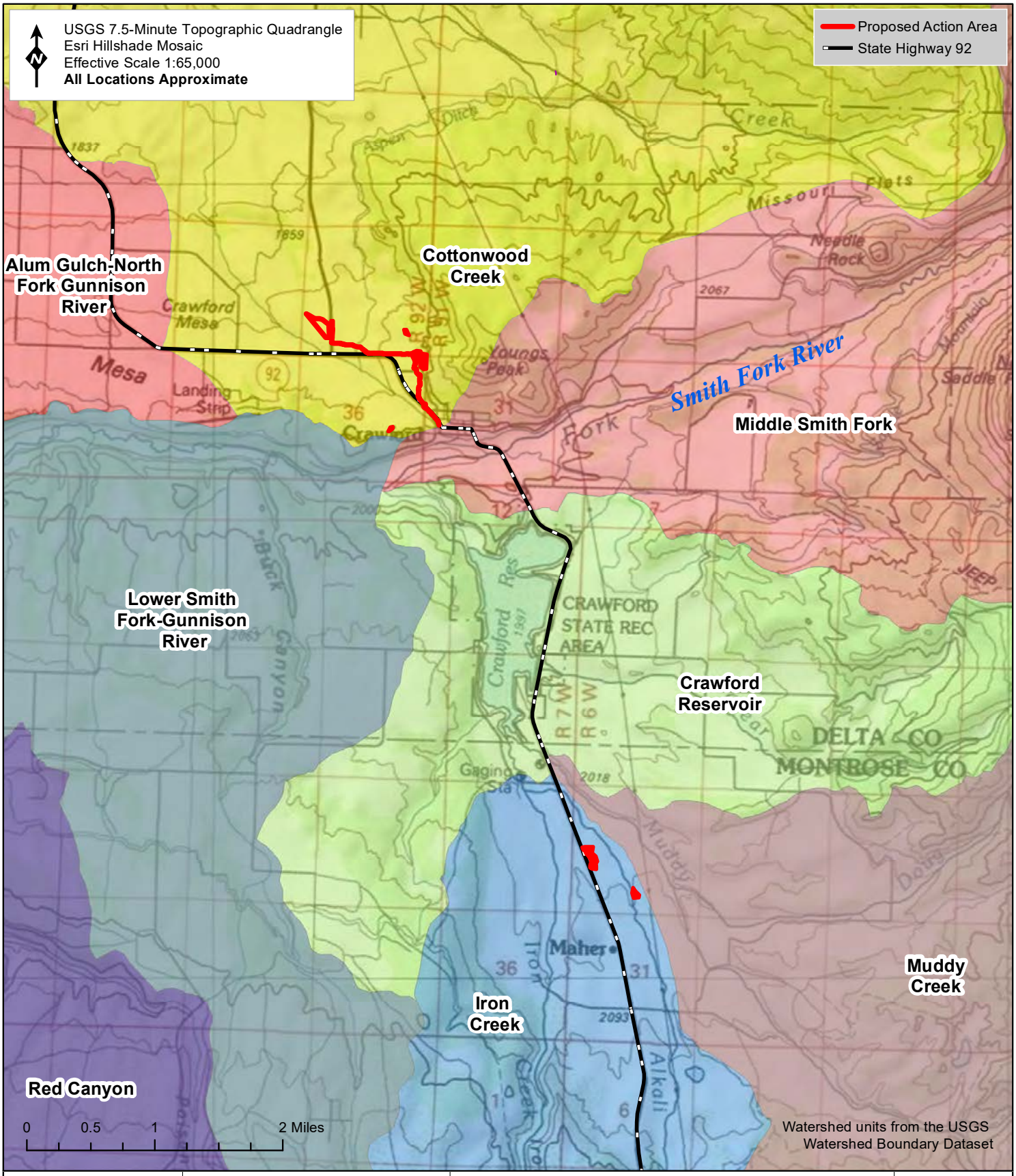
# AERIAL OVERVIEW OF PROPOSED ACTION AREA

**ZANNI LATERAL PIPELINE PROJECT**
**ENVIRONMENTAL ASSESSMENT**
**Delta & Montrose Counties, Colorado**

**FIGURE 4**

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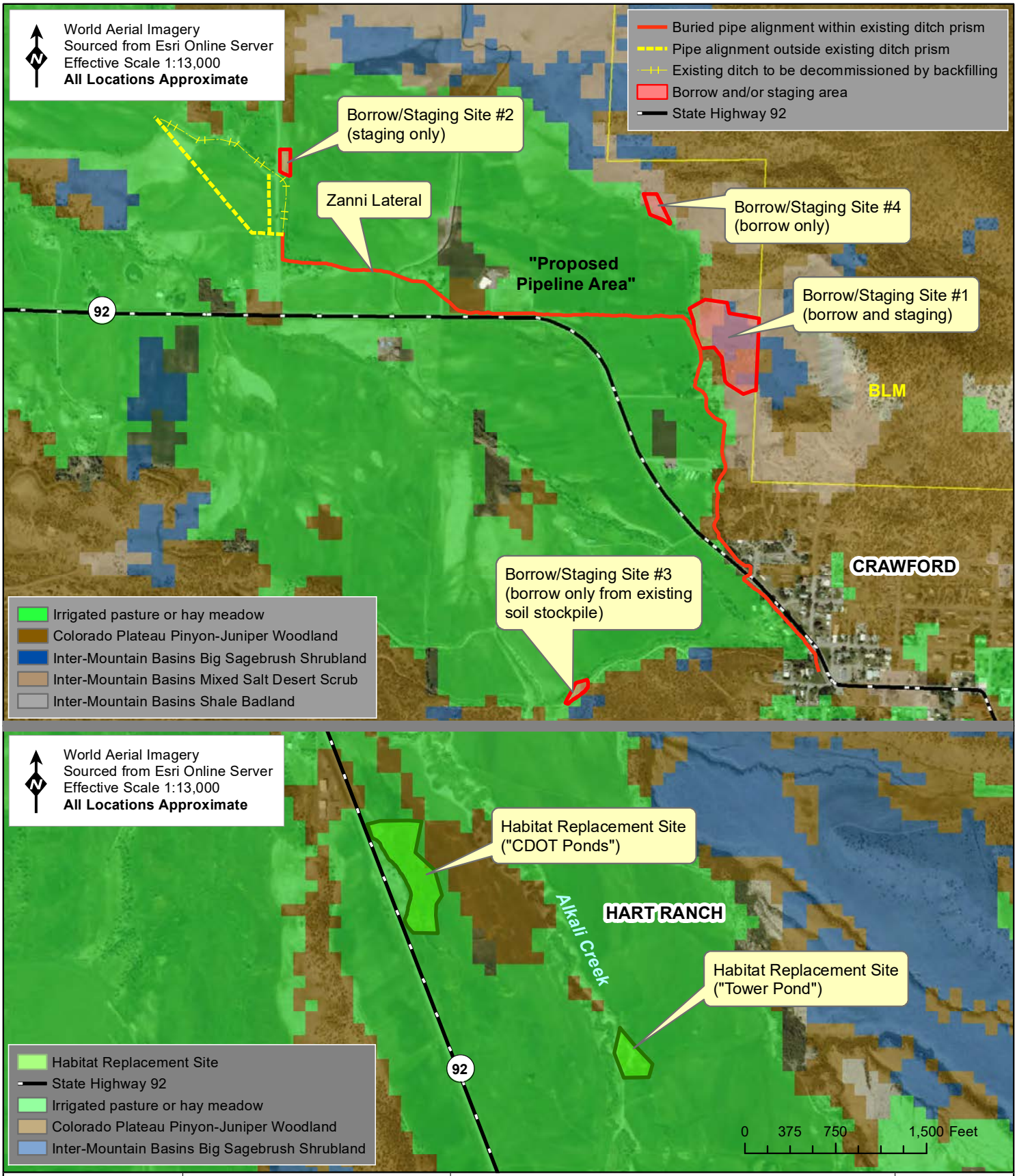
# HYDROLOGIC UNIT MAP OF THE PROJECT VICINITY

**ZANNI LATERAL PIPELINE PROJECT**
**ENVIRONMENTAL ASSESSMENT**
**Delta & Montrose Counties, Colorado**

**FIGURE 5**

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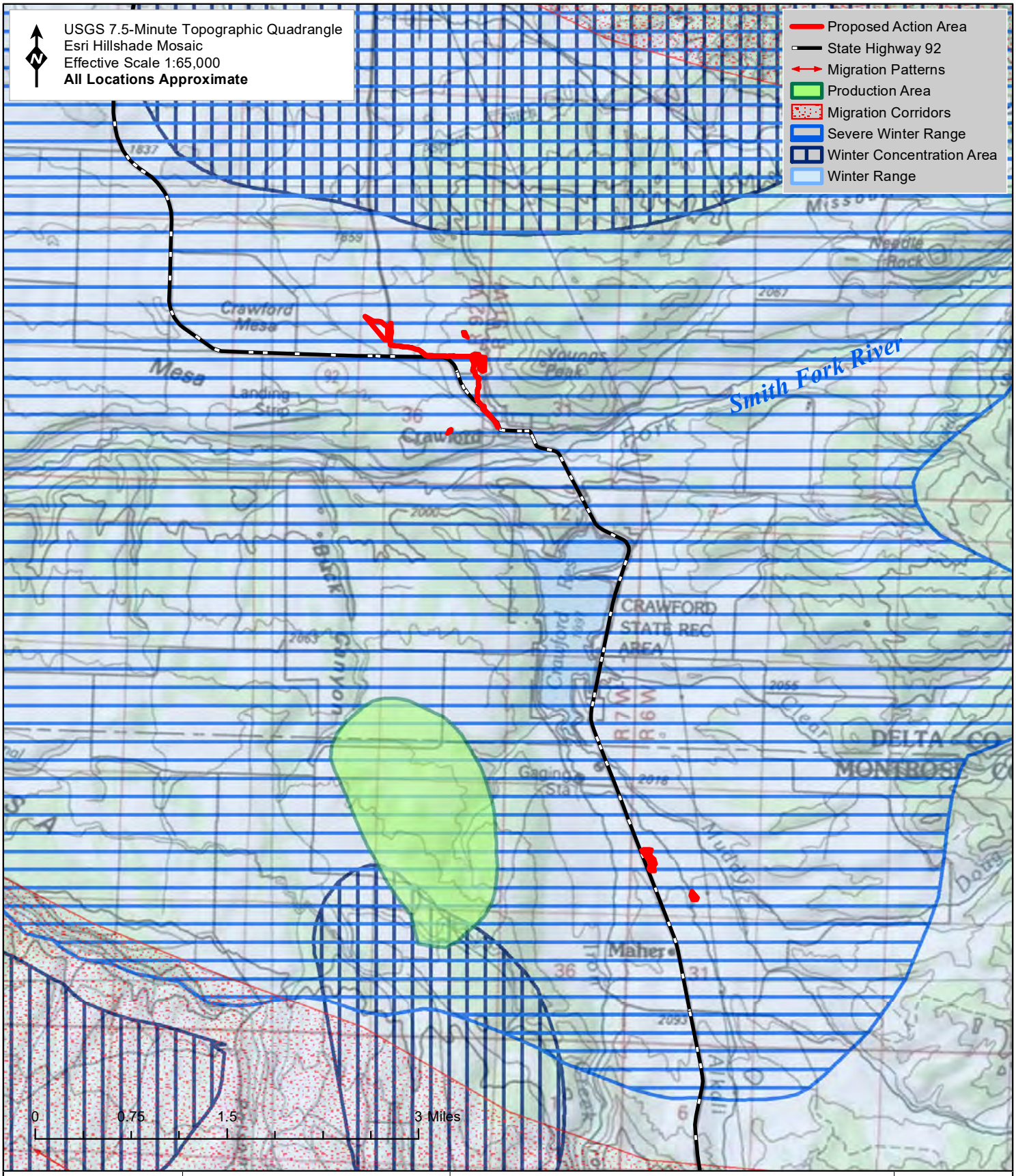
# LANDCOVER TYPES IN THE PROPOSED ACTION AREA

**ZANNI LATERAL PIPELINE PROJECT**
**ENVIRONMENTAL ASSESSMENT**
**Delta & Montrose Counties, Colorado**

**FIGURE 6**

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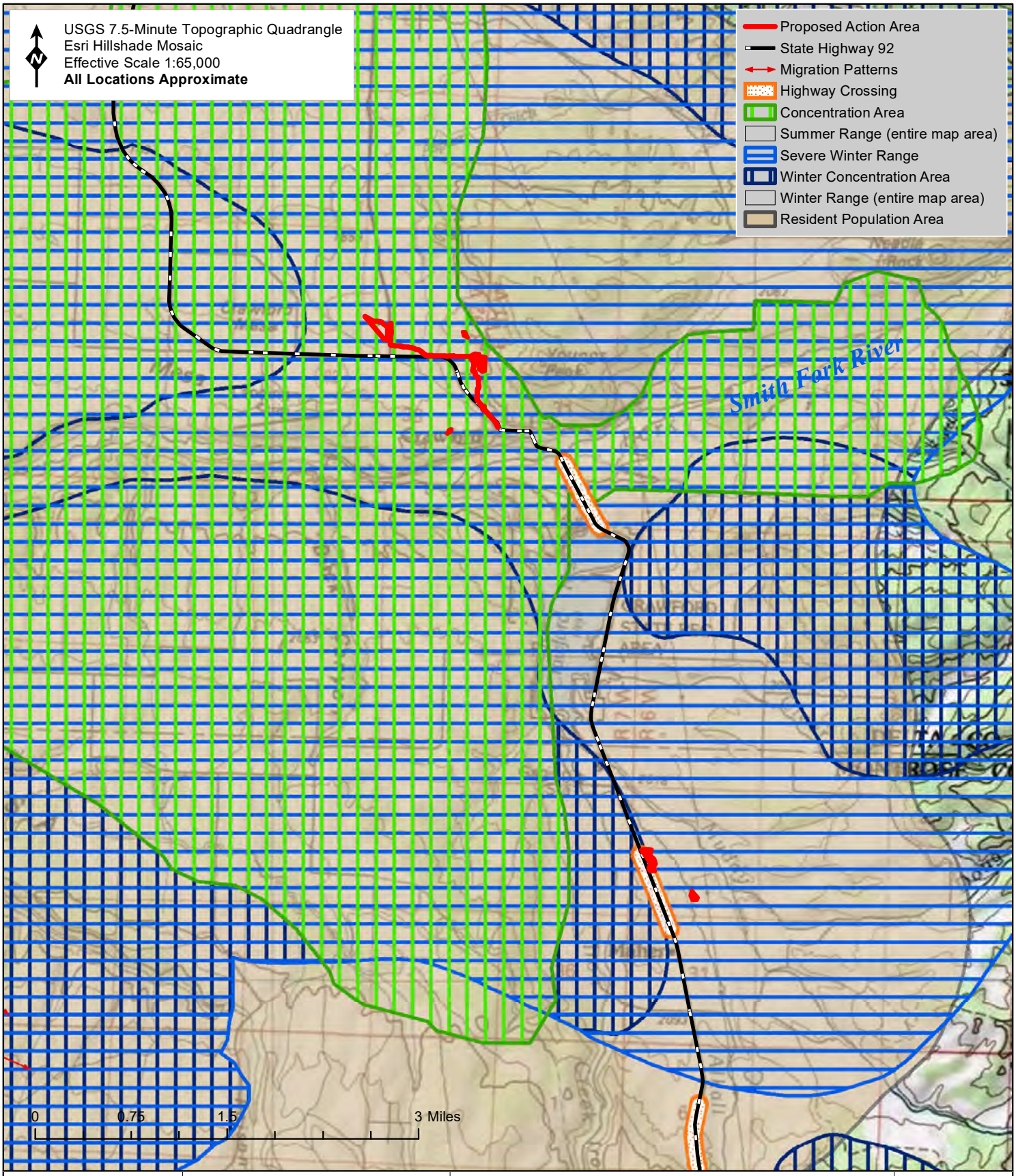
# ELK RANGE

**ZANNI LATERAL PIPELINE PROJECT**
**ENVIRONMENTAL ASSESSMENT**
**Delta & Montrose Counties, Colorado**

**FIGURE 7**

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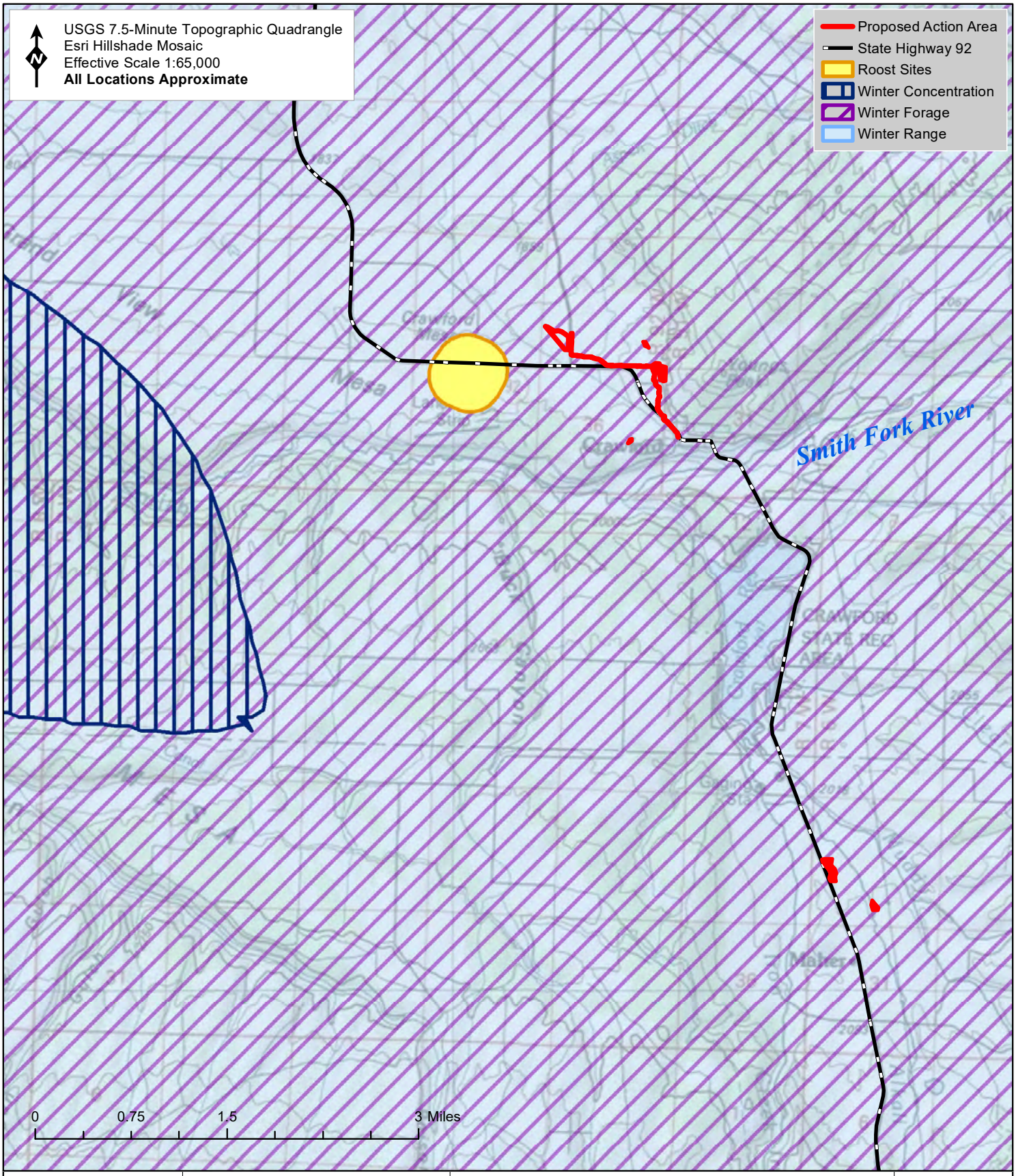
# MULE DEER RANGE

**ZANNI LATERAL PIPELINE PROJECT**
**ENVIRONMENTAL ASSESSMENT**
**Delta & Montrose Counties, Colorado**

**FIGURE**
**8**

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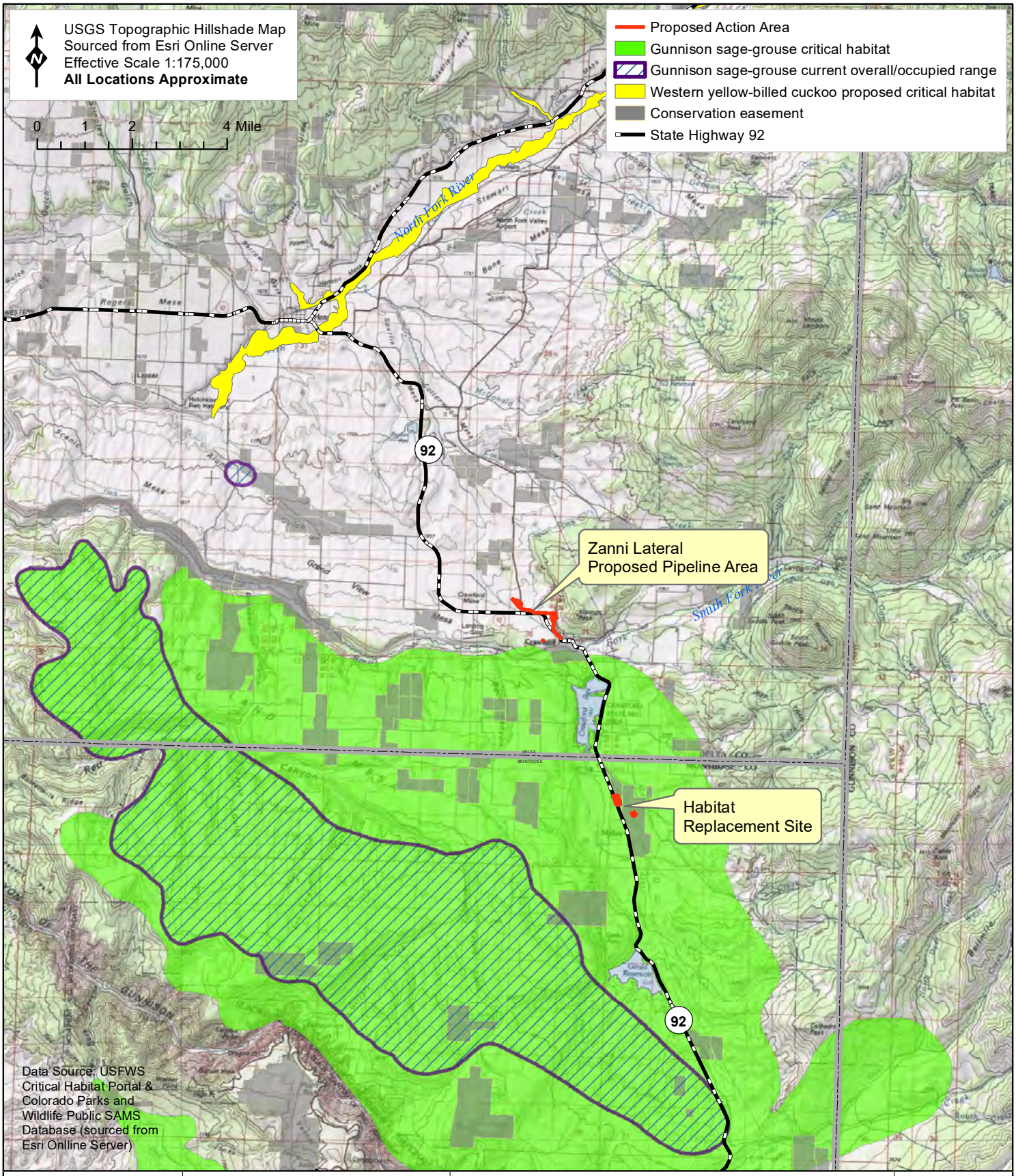
# BALD EAGLE RANGE

**ZANNI LATERAL PIPELINE PROJECT**
**ENVIRONMENTAL ASSESSMENT**
**Delta & Montrose Counties, Colorado**

**FIGURE**
**9**




DATE: October 2015

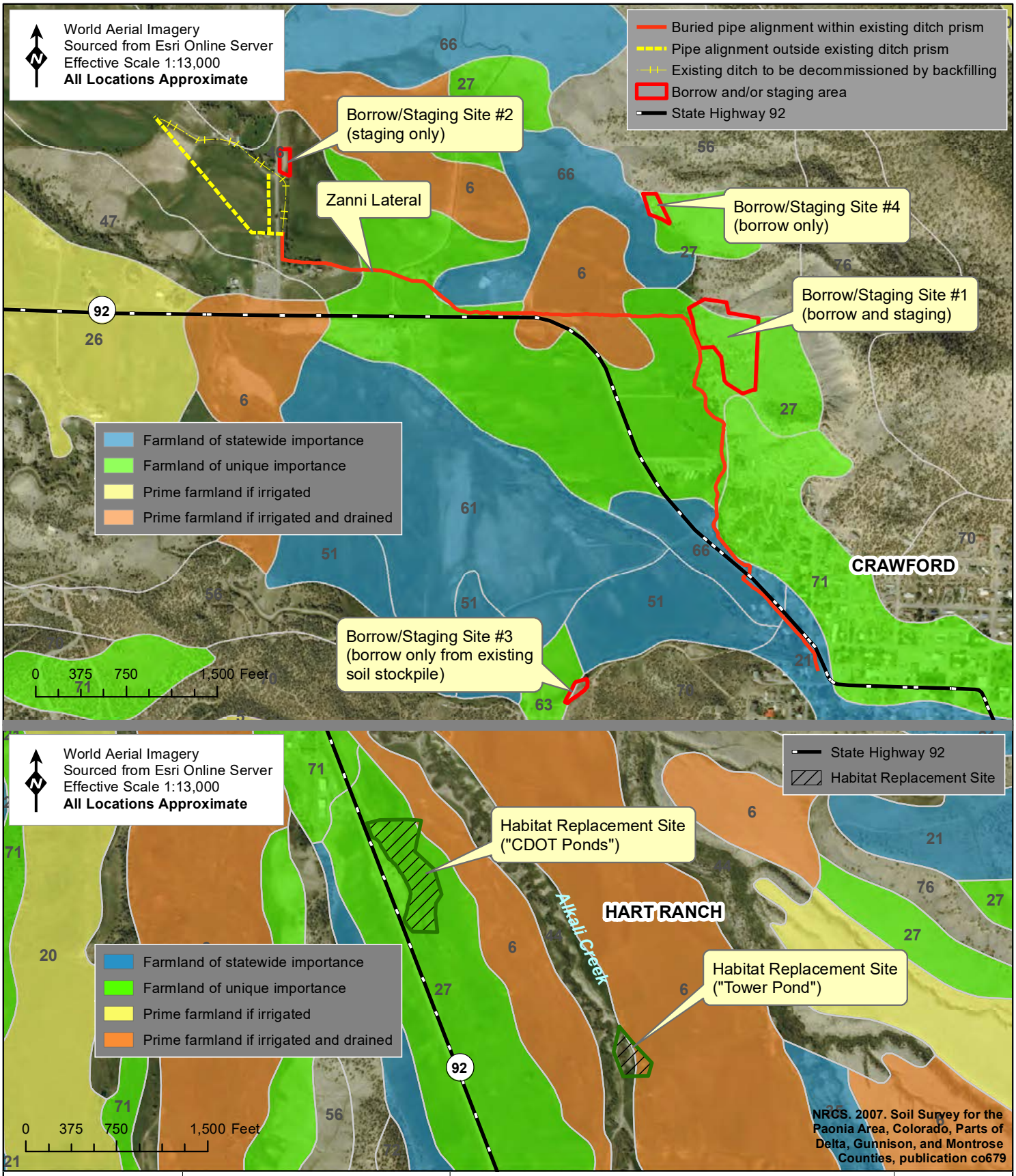
DRAWN BY: D. Reeder

RARE EARTH SCIENCE
PO Box 1245
Paonia, Colorado 81428
(970) 527-8445
*www.rareearthscience.com*

# CRITICAL HABITAT IN THE PROPOSED ACTION VICINITY

**ZANNI LATERAL PIPELINE PROJECT**
**ENVIRONMENTAL ASSESSMENT**
**Delta & Montrose Counties, Colorado**

**FIGURE**
**10**




DATE: October 2015

DRAWN BY: D. Reeder

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# SOILS OF AGRICULTURAL SIGNIFICANCE

**ZANNI LATERAL PIPELINE PROJECT**
**ENVIRONMENTAL ASSESSMENT**
**Delta & Montrose Counties, Colorado**

**FIGURE**
**11**

# ATTACHMENT A

RESERVED FOR Comment Letters Received on the DRAFT EA

# ATTACHMENT B

Distribution List

All shareholders of Zanni Lateral of the Crawford Clipper Ditch
All landowners within adjacent to the Proposed Action Area
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
Crawford Clipper Ditch Company
Delta Conservation District
Delta County Independent
Delta County Planning & Development
Delta County Road & Bridge Administration
Delta Montrose Electric Association
Hart Ranch (Don & Jane Hart)
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. Fish and Wildlife Service
Western Slope Conservation Center

# ATTACHMENT C

Section 404 Clean Water Act Exemptions Documentation

**DEPARTMENT OF THE ARMY**
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

November 5, 2015

Regulatory Division SPK-2015-00970

Ms. Patrice Alonzo & Mr. Gary Kraai
Crawford Clipper Ditch Company
445 West Gunnison Avenue, Suite 221
Grand Junction, CO 81501

Dear Ms. Alonzo & Mr. Kraai:

We are writing in regards to your proposed Zanni Lateral Piping project which would convert approximately 1.7 miles of open irrigation ditch to buried irrigation pipe to help reduce salinity. The project site is located northwest of the Town of Crawford, within Sections 25 and 36 of Township 15 South, Range 92 West, Sixth Principal Meridian, centered near Latitude 38.712°, Longitude -107.619°, Delta County, Colorado.

Based on the information provided by Rare Earth Science, LLC and the Bureau of Reclamation, we have demined that the proposed work is exempt from Section 404 of the Clean Water Act. Therefore, a Department of the Army Permit is not required for this work. A Department of Army Permit is required to place fill or dredged material in waters of the United States, including wetlands. If the proposed work at the associated habitat restoration site does not involve placing fill or dredged material into waters of the United States, then no permit would be required. Measures should be taken to prevent construction materials and/or activities from entering any waters of the United States. Appropriate soil erosion and sediment controls should be implemented onsite to achieve this end.

Our disclaimer of jurisdiction is only for this activity as it pertains to Section 404 of the Federal Clean Water Act and does not refer to, nor affect jurisdiction over any waters present on site. Other Federal, State, and local laws may apply to your activities. Therefore, in addition to contacting other Federal and local agencies, you should also contact state regulatory authorities to determine whether your activities may require other authorizations or permits.

Please refer to identification number SPK-2015-00970 in any correspondence concerning this project. If you have any questions, please contact Ben Wilson at the Colorado West Regulatory Branch, 400 Rood Avenue, Room 224, Grand Junction, Colorado 81501, by email at Benjamin.R.Wilson@usace.army.mil, or telephone at 970- 243-1199 #12. We would appreciate your feedback. At your earliest convenience, please tell us how we are doing by completing the customer

survey from the link on our website, listed above. For more information regarding our program, please visit our website at www.spk.usace.army.mil/Missions/Regulatory.aspx.

Sincerely,

Original Signed
Susan Bachini Nall
Chief, Colorado West
Branch Regulatory Division

Cc:
Ms. Dawn Reeder, Rare Earth Science, LLC, Post Office Box 1245, Paonia, Colorado 81428
Ms. Lesley McWhirter, Environmental and Planning Group Chief, Bureau of Reclamation, 445 West Gunnison Avenue, Suite 221, Grand Junction, Colorado 81501
Ms. Janie McCulloch, Delta County Planning and Community Development, 501 Palmer Street, Suite 105, Delta, Colorado 81416

# Irrigation Exemption Summary

**US Army Corps of Engineers**

Sacramento District
1325 J Street
Sacramento, CA 95814-2922

## 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 West Regulatory Branch-400 Rood Ave., Room 224, Grand Junction, CO 81501 | (970) 243-1199 |
| Durango Office-1970 E 3rd Ave, #109, Durango, CO 81301 | (970) 259-1604 |
| St. George Office-196 E Tabernacle Street Room 30, St. George, UT 84770 | (435) 986-3979 |
| | |

# ATTACHMENT D

Delta County Noxious Weed Management Plan, Adopted April 5, 2010

Montrose County Weed Management Plan, April 18, 2011

# DELTA COUNTY NOXIOUS WEED MANAGEMENT PLAN
**Adopted April 5 , 2010**

## I INTRODUCTION

1.01 Purpose

The purpose of the Delta County Noxious Weed Management Plan is to protect effectively against designated noxious weeds which constitute a present threat to the continued economic and environmental value of lands in the unincorporated County. This Plan implements the mandates of the Colorado Noxious Weed Act, and includes setting forth management objectives, plans, methods or practices which utilize a variety of techniques for the integrated management of noxious weeds. In establishing a coordinated program for the integrated management of noxious weeds, it is the County's intent to encourage all appropriate and available management methods, promoting those methods which are the most environmentally benign and which are practical and economically feasible, consistent with the noxious weed management objectives and plans mandated by the State Department of Agriculture and the Colorado Noxious Weed Act.

1.02 Enactment Authority

This plan complies with the Colorado Noxious Weed Act (Title 35, Article 5.5, C.R.S) as revised by the 2004 Colorado Legislature. The purpose of the Delta County Noxious Weed Management Plan is to coordinate the control of targeted noxious weeds within Delta County as determined by the Colorado Noxious Weed Act. The targeted noxious weeds to be controlled are designated within this plan. Control is aimed at eradicating, reducing, suppressing or containing populations of non-native, invasive noxious weeds which pose a threat to the environment and economy of Delta County by reducing wildlife habitat, agricultural production, property values, and threatening the native plant populations unique to Delta County.

1.03 Jurisdiction and Scope

Upon acceptance of this plan, the Delta County Board of County Commissioners will approve the new Delta County Noxious Weed Management Plan (CRS§35-5.5-105). The Delta County Noxious Weed Program (the Program) will then implement the Delta County Noxious Weed Plan. The Program will monitor and control weeds on county properties, on governmental properties and right of ways under intergovernmental cooperative agreements between the federal and state governments found within the county, and on private property under contract with the private property owner. Municipalities in Delta County are not covered by this Plan and must implement their own weed control strategies.

The Colorado Noxious Weed Act provides a mechanism to enforce weed control on private lands. A summary of this act is found in Attachment A. However, the Delta County Commissioners have historically preferred to pursue a policy of voluntary weed control by property owners. Enforcement procedures for control of selected species on the Colorado Department of Agriculture A and B list will be implemented when necessary. These species, as of January 1, 2010, are yellow starthistle, purple loosestrife and leafy spurge.

1.04 Severity of Noxious Weeds in Delta County

Delta County currently has some well established weed problems that cannot be solved in the near term. The primary weeds in this category are Russian knapweed, Canada, musk and scotch thistles and hoary cress (whitetop). A second group of weeds can be controlled in a very short period of time with prompt identification and diligent control. These include oxeye daisy, yellow toadflax and escaped ornamentals such as myrtle spurge and purple loosestrife. The largest infestation of yellow starthistle in Colorado was found northwest of Paonia in 2008. This infestation will get the highest priority for control. The increased soil disturbance through the subdivision of land into residential and recreational areas, as well as increased use of public and private lands may create new noxious weed problems. It is imperative that the Delta County Weed Control Program continues to monitor weed populations throughout the county and initiate control programs before weed densities of new infestations become unmanageable.

1.05 Operating Budget

The Delta County Noxious Weed Program is administered by Delta County Board of County Commissioners. Funding sources include the Delta County General Fund, cooperative funding with public agencies, grants, and revenue producing contracts. Memorandums of Understanding (MOUs) are currently in place between Delta County and the US Forest Service, Bureau of Land Management and the Colorado Division of Wildlife.

1.06 Public Comment

Public comment and participation is encouraged. Public comments may be directed to the Program Coordinator in the Hotchkiss Courthouse Annex, members of the Weed Advisory Board or to the Board of County Commissioners.

1.07 Delta County Weed Advisory Board

The Delta County Commissioners will appoint the Delta County Weed Advisory Board (CRS§35-5.5-107). The Delta County Weed Advisory Board will provide policy and advice for weed control in Delta County with the approval of the Delta County Board of County Commissioners. Powers for the Weed Advisory Board are outlined in the Colorado Noxious Weed Act under the provision of CRS§35-5.5-107.

1.08 Weed Lists: State of Colorado

Under the Colorado Noxious Weed Act, the Colorado Department of Agriculture has appointed a Colorado State Noxious Weed Advisory Board. The Colorado State Noxious Weed Advisory Board and the Department of Agriculture Commissioner have designated the following classifications and management goals for the noxious weed species below:

## List A Species

List A species in Colorado are designated by the Commissioner for eradication. These weeds are either relatively rare or have not been found in Colorado. Species that are in **bold print** are known to exist in Delta County as of January 1, 2009**.**

African rue (*Peganum harmala*)
Camelthorn (*Alhagi pseudalhagi*)
Common crupina (*Cupina vulgaris*)
Cypress spurge (*Euphorbia cyparissias*)
Dyers woad (*Isatis tinctoria*)
Giant salvinia (*Salvinia molesta*)
Hydrilla (*Hydrilla verticillata*)
Meadow knapweed (*Centaurea pratensis*)
Mediterranean sage (*Salvia aethopsis*)
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 jabobaea*)
**Yellow starthistle (*Centaurea solstitialis*)**

## List B Species

List B weed species are species for which the Commissioner (in consultation with the state noxious weed advisory committee, local governments, and other interested parties) develops and implements state noxious weed management plans designed to stop the continued spread of these species. Species that are in **bold print** are known to exist in Delta County as of January 1, 2009

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*)
Dalmatian toadflax *(Linaria dalmatica)*
**Dame's rocket *(Hesperis matronalis)***
Diffuse knapweed *(Centaurea diffusa)*
Eurasian watermilfoil *(Myriophyllum spicahim*)
**Hoary cress or Whitetop *(Cardaria draba)***
**Houndstongu*e (Cynoglossum officinale)***
**Leafy spurge *(Euphorbia esula)***
**Moth mullein (*Verbascum blattaria*)**
**Musk thistle *(Carduus nutans)***
**Oxeye daisy *(Chrysantheum leucanthemum)***
**Perennial pepperweed (*Lepidium latifolium*)**
**Plumeless thistle *(Carduus acanthoides)***
**Quackgrass (*Elytrigian repens*)**
**Redstem filaree (*Erodium cicutarium*)**
**Russian knapweed *(Centaurea repens)***
**Russian olive (*Elaneagnus angustifolia*)**
**Saltcedar *(Tamarix ramossissima)***
**Scentless chamomile *(Matricaria perorate)***
**Scotch thistle (*Onopordum acanthium*)**
**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 Species

List C weed species are species for which the Commissioner (in consultation with the state noxious weed advisory committee, local governments, and other interested parties) will develop and implement state noxious weed management plans designed to support the efforts of local governing bodies to facilitate more effective integrated weed management on private and public lands. The goal of such plans will be to stop the continued spread of these species and provide additional education, research, and biological control resources to jurisdictions that choose to require management of List C species. Species that are in **bold print** are known to exist in Delta County as of January 1, 2009

**Cheatgrass *(Bromus tectorum)***
**Chicory (*Cichorium intybus*)**

**Common burdock (*Arctium minus*)**
**Common mullein *(Verbascum thapsus)***
**Field bindweed *(Convolvulus arvensis)***
**Halogeton (*Halogeton glomeratus*)**
**Johnsongrass (*Sorghum halepense*)**
**Jointed goatgrass (*Aegilops cylindrica*)**
**Perennial sowthistle (*Sonchus arvensis*)**
**Poison hemlock (*Conium maculatum*)**
**Puncturevine (*Tribulus terrestris*)**
**St. Johnswort *(Hypericum perforatum*)**
**Velvetleaf *(Abutilon theophrasti*)**
**Volunteer rye (*Secale cereale*)**
**Wild-prose millet (*Panicum miliaceum*)**

1.09 Delta County Noxious Weed List

Yellow starthistle (*Centaurea solstitialis)*
Purple loosestrife (*Lythrim salicaria)*
Myrtle spurge *(Euphorbia myrsinites)*
Common burdock (*Arctium minus*)
Diffuse knapweed *(Centaurea diffusa)*
Spotted knapweed (*Centaurea maculosa*)
Russian knapweed *(Centaurea repens)*
Hoary cress or Whitetop *(Cardaria draba)*
Leafy spurge *(Euphorbia esula)*
Canada thistle *(Cirsium arvense)*
Musk thistle *(Carduus nutans)*
Scotch thistle (*Onopordum acanthium*)
Bull thistle *(Cirsium vulgare)*
Yellow toadflax *(Linaria vulgaris)*
Oxeye daisy *(Chrysantheum leucanthemum)*
Poison hemlock (*Conium maculatum*)
Halogeton (*Halogeton glomeratus*)
Russian olive (*Elaneagnus angustifolia*)
Saltcedar *(Tamarix ramossissima)*

## II: GEOGRAPHICAL OVERVIEW OF COUNTY DESIGNATED NOXIOUS WEED INFESTATIONS IN DELTA COUNTY

2.01 Description of Delta County

1. Major Natural Features:
   a. Lakes and Reservoirs: Crawford Reservoir, Sweitzer Lake, Fruitgrowers Reservoir, numerous Grand Mesa lakes and reservoirs.

b. Major River Drainages: Gunnison River, North Fork Gunnison River, Uncompaghre River, Surface Creek, Escalante Creek.
c. Major Mountain Ranges: West Elks, Grand Mesa (south side) lower Uncompaghre Plateau (east side). Highest elevation approximately 11,300 feet
d. National Forests: Grand Mesa National Forest, Gunnison National Forest
e. Wilderness: Gunnison Gorge

2. Land Use Statistics:
   a. Total acreage 735,532 acres (1149 square miles)
   b. Federal or state ownership- 415,749 acres acres (56 %)
   c. Agricultural lands-254,144 acres (36%)
   d. Residential land-25,743 acres (3.5%)
   e. Other: 33,099 acres (4.5%)

2.02 County-wide Infestations

The most common County designated noxious weeds on private, Bureau of Land Management and County lands (primarily county roads) are Russian knapweed, whitetop, and Canadian thistle. The most widely spread listed weed on U.S. Forest Service managed lands is Canadian thistle.

2.03 State Highways

Russian knapweed and whitetop are the most common. Yearly spray treatments were made from 1996 until 2006. Infestation densities were reduced about 80 percent. Colorado Department of Transportation (CDOT) budget reallocations curtailed this program in 2007-2008. The primary weed problem currently is kochia (not a listed noxious weed).

2.04 North Fork River

The North Fork has scattered infestations of whitetop, Russian knapweed, oxeye daisy, yellow toadflax and scotch thistle. There are dense concentrations of tamarisk and Russian Olive. The property on most of the river is private. Control efforts for all species has been minimal.

2.05 Gunnison River: Smith Fork-Pleasure Park-Lawhead Gulch

The primary weed species are Russian knapweed, tamarisk and whitetop. Control efforts for all species has been ongoing since 2002. Approximately 90 percent of tamarisk has been removed between the Smith Fork and Lawhead Gulch (16 miles). There are minor infestations of yellow toadflax and oxeye daisy between Pleasure Park and Delta. Russian olive is the main invader downstream from Austin to the Highway 65 bridge.

2.06 Gunnison River: Delta to Mesa County

Russian knapweed and tamarisk are the primary invaders.

2.07 West and Southwest Delta County

The dominating invasive species are Russian knapweed, whitetop and halogeton. Halogeton will be first to take hold in disturbed areas such as pipelines and utility corridors

2.08 Upper Surface Creek Area

Scotch thistle, Canadian thistle, Russian knapweed and whitetop are common. There is also a large population of myrtle spurge on the west side of Cedaredge within the city limits.

2.09 Northeastern Delta County

Large portions of this area are within the Grand Mesa and Gunnison National Forests. There are also some large parcels of private land. This area is much higher in altitude than the rest of Delta County. Weeds that thrive in this alpine setting are Canadian thistle, musk thistle, oxeye daisy and scentless chamomile. There are a few spots of plumeless thistle. In the West Muddy drainage, there are some oxeye daisy populations that cover hundreds of acres. Most of these are on open ground such as pastures and meadows. Joint control efforts between the U.S. Forest Service, Delta County and private landowners have been ongoing since 2001 for oxeye daisy. Much of the work on private land was funded by Colorado Division of Wildlife and conducted by the Program.

2.10 Fruitland and Redlands Mesa

Both of these mesas have very large, long established populations of Russian knapweed on private land and county roads. Whitetop is a secondary infestation. Control of knapweed in parts of these areas is prohibitively expensive. A second problem is that when knapweed is controlled, whitetop tends to replace it.

2.11 Special Weed Concern # 1: Yellow starthistle

Yellow starthistle is located northwest of Paonia on Stucker Mesa ½ mile west of Roatcap Creek. The estimated acreage is 75 infested acres spread out over about 400 total acres. The majority if the starthistle is on private land. Several small, scattered patches are on the surrounding BLM land.

2.13 Special Weed Concern # 2: Purple loosestrife

Purple loosestrife is located on private land southwest of Cedaredge, three quarters of a mile west of Highway 65 and directly south of Melinda Way. There are two main infestation covering 20 acres and several groups of plants scattered along neighboorhood ponds and ditches.

2.13 Special Weed Concern # 3: Leafy spurge

Leafy spurge is found primarily east and south of Paonia. Private lands on both sides of Minnesota Creek Road as well as the BLM land south of this road were the original seed source of the infestation. Transportation vectors for spreading leafy spurge seed have been the Turner, Minnesota and Stewart Ditches. Plants have been found on the Stewart Mesa extension as far southwest at Back River Road and Slate Road. Plants have been found on Stewart Mesa as far south as L

75 Road. Except for two portions of private land along Minnesota Creek, infestations are spotty and small. Usually they appear along irrigation laterals or adjacent to irrigation gated pipe. Smaller outbreaks of this weed are treated by the Program at no charge to the landowner. This problem weed is persistent but has been contained.

2.14 Special Weed Concern # 4: Yellow toadflax on Coal Creek (Gunnison County)
There were 640 acres of inventoried toadflax in the Coal Creek/Anthracite drainage in 2005. Coal Creek is one of the headwaters of the North Fork of the Gunnison River. The North Fork joins the Gunnison River 3 miles west of Hotchkiss. Toadflax has been found along irrigation systems in eastern Delta County that get water from the North Fork and as far downstream on the Gunnison as Delta (42 miles downstream from Coal Creek). The Coal Creek drainage is the seed source. There are no other large toadflax infestations in the area that could be a source. The Delta County Weed Program and the U.S. Forest Service worked on a joint program from 2004-2007 to control this weed. As of September 2007, expenditures amounted to $103,000. Toadflax populations have been reduced by 75-80 percent. This project continued in 2008 and included the Paonia Dam and the Fire Mountain ditch. In 2008 the Program received $26,000 in grant funding for this project.

2.15 Endangered or Rare Plant Species
Delta County hosts two plants that are on the Federal Endangered Species list. These are Clay Loving Buckwheat (*Eriogonum pelinophilum*) and the Uinta Basin Hookless Cactus.(*Sclerocactus glaucus*). Thirteen more species are considered to be rare according to a Colorado Natural Heritage Program survey conducted in 1997. This survey is on file at the Program's Hotchkiss office. These survey maps are checked before herbicide treatments begin each year in order to avoid further disturbance of these rare plant populations.

## III: PLAN IMPLEMENTATION STRATEGIES

3.01 Goals of the Plan

The goals of this Delta County Weed Management Plan are to comply with and execute the requirements of the .Colorado Noxious Weed Act. The Program will accomplish these goals by instituting county-wide programs that address the following fundamentals:

- Awareness, education and training
- Prevention and detection
- Inventory, survey and mapping
- Integrated control (biological, chemical, cultural and mechanical)
- Monitoring and evaluation
- Reporting

It is essential to develop a spirit of cooperation among landowners (federal, state, county, municipal or private) and Delta County by working with these landowners to understand and institute integrated weed management.

3.02 Public Awareness and Education

The Delta County Noxious Weed Program and Colorado State University Cooperative Extension Office will place timely articles in local papers, newsletters and other local publications. Additionally, a spokesperson will be provided for local community and civic organizations as part of the educational program. On-site visits to landowners to identify weed problems and improvise control strategies will be provided at no charge to landowners. A Delta County Weed Program website will be placed within the existing Delta County official site with links to information on identifying and controlling noxious weeds.

3.03 Prevention Measures.

The first priority is to prevent the introduction of any noxious weed to any area not previously infested. The most obvious method is to stop transporting viable seed or propagating plant parts by mechanical means. All equipment should be cleaned when leaving all infested areas to prevent contaminating rights-of-way and the next area entered.

Along these lines, it is strongly recommended that everyone use noxious weedfree certified seed. Feed containing viable noxious weed seeds should not be purchased, transported, or used: Since designated weeds will set seed prior to normal harvest dates, crops need to be treated if they are to be moved from the infested area.

Also to be considered is once seed has reached maturity, it can remain viable for years. During this time, it can re-infest the same area long after the weed problemappears to have been solved, or it can be transported to other areas. This can occur naturally by wind and water or mechanically by movement of vehicles or equipment. Seeds are also transported great distances by domestic animals and wildlife.

Many of the most common weed problems occur in response to disturbed soils. Disturbances can result from a number of conditions including overgrazed pastures, overused turf, clear cut woodlands, pipeline construction and energy/gravel development, improperly maintained road edges, and land development. Land management practices that minimize soil disturbance are invaluable in prevention and control of undesirable plant species.

3.04 Surveying and Mapping

It is the long term goal of the Program to map the major infestations of noxious weeds on the county and state roads using GIS and GPS technology that will allow integration into a layer on the Delta County GIS map.

3.05 Mechanical Control

Mechanical control includes cultivation, mowing, hand pulling and burning. All of these measures, when used correctly, can be of great help when used in conjunction with another type of control. When used alone, they rarely have a positive long-range effect due to the excellent survival ability of noxious weeds. It may, in fact, make the problem worse through spreading seed or plant parts and by eliminating the desirable competitive species on site.

3.06 Biological Control

Biological control is the control of undesirable plants through the use of living organisms. The organism may be an insect, plant, pathogen or livestock, such as sheep, goats or cattle. Recent programs have shown livestock to be very valuable in controlling many weed species. This is especially true in instances of large infestations and in environmentally sensitive areas. When moving livestock from such an infested area for biological control, care should be taken to prevent transportation of seeds to a clean area. If possible, when applicable, livestock should be quarantined for five days to allow all seed to pass through the digestive track. Seed may also need to be sterilized or removed from the animals' hair or wool.

Several varieties of insects which can be used on various plants are commercially available. They may be purchased by individuals to be used as part of an integrated plan. This type of control is still in its infancy. It is being researched and directed by the Colorado Department of Agriculture Insectary in Palisade, Colorado. Ideally, insects will provide an economical and environmentally safe control method. However, there are certain problems associated with this type of control. First, there is a limited supply of all species and purchasing insects may require a large initial investment. The compatibility of herbicides and insects is not well known. Also, participation in this project may preclude the use of certain types of control, which would allow infestations to multiply and set seed. To prevent this, land operators must prepare an integrated plan to effectively control these infestations. Research indicates insects may be a valuable control method to be used in integrated pest management plans in the future.

3.07 Chemical Control

All chemical application must be done according to the label for each individual product**.** The choice of chemicals and application rates that are used should be the least environmentally damaging as determined by information currently available. This determination may come first from the recommendations in the Colorado Pesticide Guide from Colorado State University Cooperative Extension. It may

also be tempered by the wishes of land owners and the experience of trained personnel associated with the program.

While chemicals are a powerful tool, it must be realized that they are just a tool and must be used only as a part of an integrated management plan.

3.08 Cultural Control

Cultural control means those methodologies or management practices conducted to favor the growth of desirable plants over undesirable plants, including, but not limited to, maintaining an optimum fertility and plant moisture status in an area, planting at optimum density and spatial arrangement in an area, and planting species most suited to an area.

3.09 Environmental Considerations

Environmental concerns including human interactions, water, air, wildlife, fisheries, amphibians, soil, plants and beneficial insects will be considered when selecting and implementing a specific weed control program. Delta County has a large number of vineyards and organic agricultural operations. These will be identified and mapped in order to avoid herbicide applications near these sites.

The Colorado Pesticide Sensitivity list will be periodically checked for the names and addresses of chemically sensitive people. No herbicides will be applied near their locations. Whenever possible, these people will be contacted prior to any herbicide application in their general area so that they can avoid traveling in that vicinity.

## IV. RESPONSIBILITIES OF THE NOXIOUS WEED PROGRAM

4.01 Strive to identify and contain, reduce or eradicate current weed infestations and reduce or eliminate weed seed production in certain species.

4.02 Monitor for new infestations and new invasive species so as to prevent new encroachments on unincorporated lands in the County.

4.03 Develop and implement Integrated Weed Management Plans for noxious weeds on County owned property, easements, and rights-of-way.

4.04 Protect agricultural production, native plant ecosystems, watersheds, and recreational lands from degradation by noxious weeds by enforcing the Noxious Weed Act and working through cooperative agreements with city, state and federal agencies and adjacent counties and states.

4.05 Preserve the quality of life in rural areas of unincorporated Delta County through desirable plant stewardship and noxious weed management to enhance human health aspects, land values and esthetics.

4.06 Provide technical support and recommendations for noxious weed management and work with landowners, including state and federal agencies, to develop their Integrated Weed Management Plans.

4.07 Educate Delta County citizens on the impact of noxious weeds on the economy and the environment and provide information on Best Management Practices for noxious weeds.

# ATTACHMENT A

**Authority: Colorado Weed Management Act: C.R.S. Title 35, Article 5.5, as amended**

**Purpose of C.R.S. Title 35, Article 5.5**

Because certain undesirable plants, primarily aggressive non-native invaders, constitute a threat to the "continuous economic and environmental value of the lands of the state", these species must be managed on private and public lands, using integrated management techniques which are the least damaging to the environment and which are practical and economically reasonable.

**A Brief Abstract**

As mandated by the Colorado Noxious Weed Act, all persons must control noxious weeds on their property if such plants are a threat to neighboring landowners or natural ecosystems. Weed control programs should be integrated in their approach, using all available technologies for effective weed control. To comply with the Law, the Board of County Commissioners must adopt a noxious weed management plan for all unincorporated lands within its jurisdiction. The Commissioners may use employees or contractors to enforce noxious weed control on county lands. Costs for aid control on county property are to be paid from the county noxious weed management fund, if one exists. The Commissioners may enter into cooperative weed management agreements with other governmental agencies.

The Noxious Weed Advisory Board, a commission of resident private landowners, must develop a management plan to be reviewed at least once every three years. At least a majority of the members of the Board must own forty or more acres of property. The Board designates which species are to be managed within the County, thereby establishing the County Noxious Weed List. Additional plants can be added to the list, after a public hearing with 30 days prior notice. The Board can require identified landowners to submit weed management plans when species on the list are found on their property.

The County has the right to inspect premises under at least one of the following conditions:

(a) the landowner requests inspection;
(b) a neighbor files a complaint or report; or
(c) the Weed Program Manager makes a visual observation of a weed infestation from a public right of way (ROW) or a public area.

Before entering private property, the landowner or occupant must be notified of the problem by certified mail. If entry is refused, an inspection warrant may be obtained by the Weed Program. A landowner cannot deny entry to inspect if a warrant is secured. After inspection, a notice of the problem and control recommendations must be sent by mail. Within 10 days of notification, the landowner or occupant must comply with the

recommendations, submit an acceptable weed management plan, or request an arbitration panel hearing. The county has the authority to act in the case of failure to comply with the Act, with an assessment of the cost of control plus overhead expenses, up to 20 percent, charged against the land. Noxious weeds may be declared a public nuisance, subject to all applicable laws and remedies for abatement, including removal or destruction of the weeds.

The County cannot force a private owner to control weeds without first having equal or greater successful control measures on county-owned lands adjacent to the private property in question.

State agencies have the same responsibility as private landowners. Notification by the county is the same as for private landowners. The county has the power to enforce and charge state agencies for weed control on state lands. The county may enter into cooperative agreements for weed management with State and Federal agencies. Public rights-of-way (ROWs), easements, utilities, mining operations, etc., must be in compliance with the management plan and must bear the financial responsibility of weed control.

The Colorado Noxious Weed Act established a state weed coordinator position to oversee implementation of the Law. A State Noxious Weed Management Fund was established to fund grants or contracts for weed management practices, with procedures for allocation of funds to appropriate entities. The fund was broadened in 2000 to include grants for educational programs. Counties may levy a tax, upon voter approval, to fund noxious weed management programs.

# ATTACHMENT B

## Herbicide Guide: The 5 Most Common Noxious Weeds of Delta County
## January 1, 2009

Note: All herbicides listed are labeled for roadsides and range and pasture. They are not labeled for turf (yards), golf courses, and public areas. Different formulations of the active ingredients are available for turf use. See your dealer for more information on these products.

| Common Target Weeds | Preferred Herbicides (based on experience by Delta County Weed Program) | Application Timing |
|---|---|---|
| | | |
| Whitetop/hoary cress | • Telar + 24D (amine)<br>• Escort/Ally | Spring: late bud-early flower |
| Russian knapweed | • Milestone<br>• Curtail, Transline, Stinger<br>• Redeem R & P | Spring: Rosette to early flower.<br>Fall: Apply up until first hard freeze.<br>Applications under drought conditions will not be effective. |
| Canada thistle | Same as Russian knapweed | |
| Scotch thistle, musk thistle | Same as Russian knapweed, or<br>• Telar<br>• Banvel + 24D (amine)* | Spring: Rosette to early flower.<br>Fall: Rosette<br>Spring: These species are biennials and be controlled by chopping/digging |
| | | |

*Banvel and 24d are very volatile in weather above 85 degrees. Vapor drift can occur and damage non-target species up to ¼ mile away!!

### WARNING!!!!

Herbicides must be used with extreme caution. They are poisons and should be treated carefully. Most herbicides can be purchased without an applicator license. Tordon requires a license for purchase. The label is a legal document that outlines the uses and restrictions of the chemical.

READ THE LABEL before buying, before applying and again after using an herbicide. READ THE LABEL before buying to determine if the herbicide is the right one for your situation, if it is labeled for the weeds you are trying to control, for information on the

addition of adjuvant or surfactants, and for other restrictions, such as for grazing and planting.

READ THE LABEL before applying to get the correct rate to use, how to mix and apply the product, what personal protection you may need while mixing and applying the herbicide, and for information on how to dispose of left over mix. READ THE LABEL after applying to check reentry intervals, to check planting and grazing restrictions, and for disposal and clean-up information. Never use more than the recommended rate on the label. Higher rates will cause the tops of the plants to burn down quickly. The herbicide may not have the chance to move into the root zone and the weed may sprout again. And you are wasting money!

Pre-emergent herbicides prevent the germination of seeds and do not work on established perennial weeds. Application timing of pre-emergents is critical; they are usually applied in the spring. Precipitation or irrigation may be needed to move the chemical into the germination zone (the top 3-5 inches of soil).

Post-emergent herbicides work on the growing parts of the weed, including roots. Therefore post-emergent herbicides work on annuals, biennials, and perennials. Drought and heat may reduce the effectiveness of these herbicides. The use of herbicides may be the only effective control method for some species. However, herbicides should be used in conjunction with other methods for the highest level of control. Herbicide use is determined by restrictions and instructions on the product label. Materials or products mentioned in this Plan are based on experience in Delta County or recommendations of Colorado State University Cooperative Extension Service and should not be construed as endorsement by Delta County.

# ATTACHMENT C

# NOXIOUS WEED INFORMATION RESOURCES

## Contacts

- **Delta County Weed Program Coordinator**
  Delta County Fairgrounds
  P.O Box 729
  Hotchkiss, CO. 81419
  970-872-3090
  Fax: 970-872-1250
  e-mail: wcallicutt@deltacounty.com

- **Colorado State University Extension**
  Dr. Curtis E. Swift, Area Extension Agent, Horticulture
  Colorado State University Extension
  2775 US Hwy 50, Grand Junction, CO. 81503
  voice: 970-244-1840
  fax: 970-244-1700

  **Delta Office CSU Extension**:
  525 Dodge Street:
  970-874-2195

  **State Weed Coordinator**
  Colorado Department of Agriculture
  Division of Plant Industry
  700 Kipling St., Suite 400
  Lakewood, CO 80215-5894
  303-239-4182
  steve.ryder@ag.state.co.us

- **Colorado Department of Agriculture: Noxious Weed Management Program**
  http://www.colorado.gov/cs/Satellite/Agriculture-Main/CDAG/1167928159176

  **Colorado Department of Agriculture**
  Division of Plant Industry
  Biological Control Section
  Palisade Insectary
  P.O. Box 400
  Palisade, CO 81526
  970-464-7916

**On Line Information:**

Note: There are more on-line sites than can be listed here. These sites have links to dozens of the most useful sites for weed identification and control.

- Colorado Weed Management Association: http://www.cwma.org/
- Colorado State University Extension-Tri River Area: http://westernslopegardening.org/
- Weed Fact Sheets: http://www.colostate.edu/Dept/CoopExt/Adams/weed/factsheet.htm
- Colorado Department of Agriculture: Noxious Weed Management Program http://www.colorado.gov/cs/Satellite/Agriculture-Main/CDAG/1167928159176
- National Invasive Species Information Center: http://www.invasivespeciesinfo.gov/index.shtml
- Center for Invasive Plant Management: http://www.weedcenter.org/
- Managing Invasive Plants: http://www.fws.gov/invasives/staffTrainingModule/index.html
- Weed Science Society of America: http://www.wssa.net/

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 parameter 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.

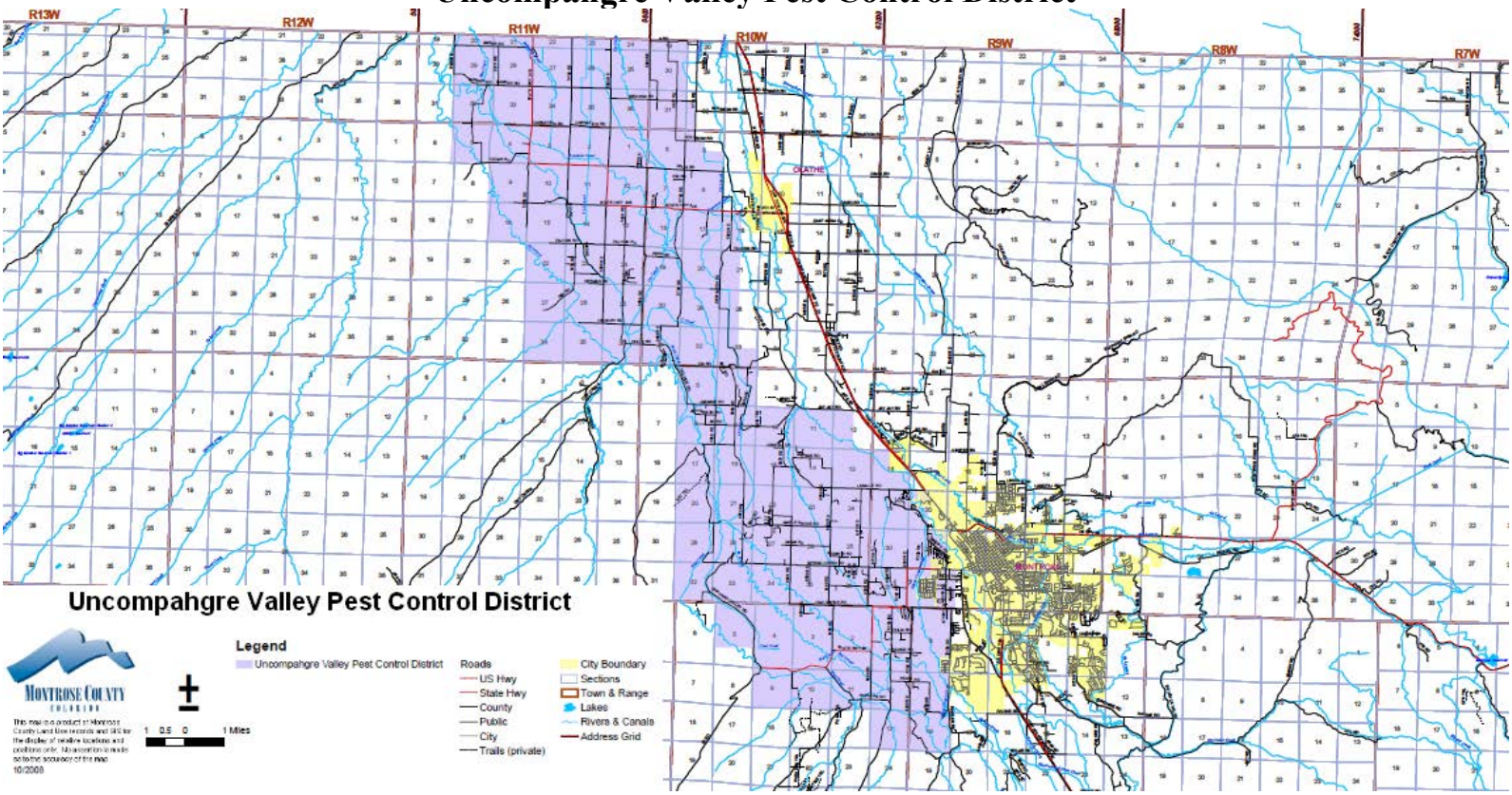
With the location of current yellow toadflax infestations on the Uncompahgre Plateau comes the accessibility issues that accompany densely forested areas and abrupt elevation and geological changes. Coupled with the need for high rates of

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.

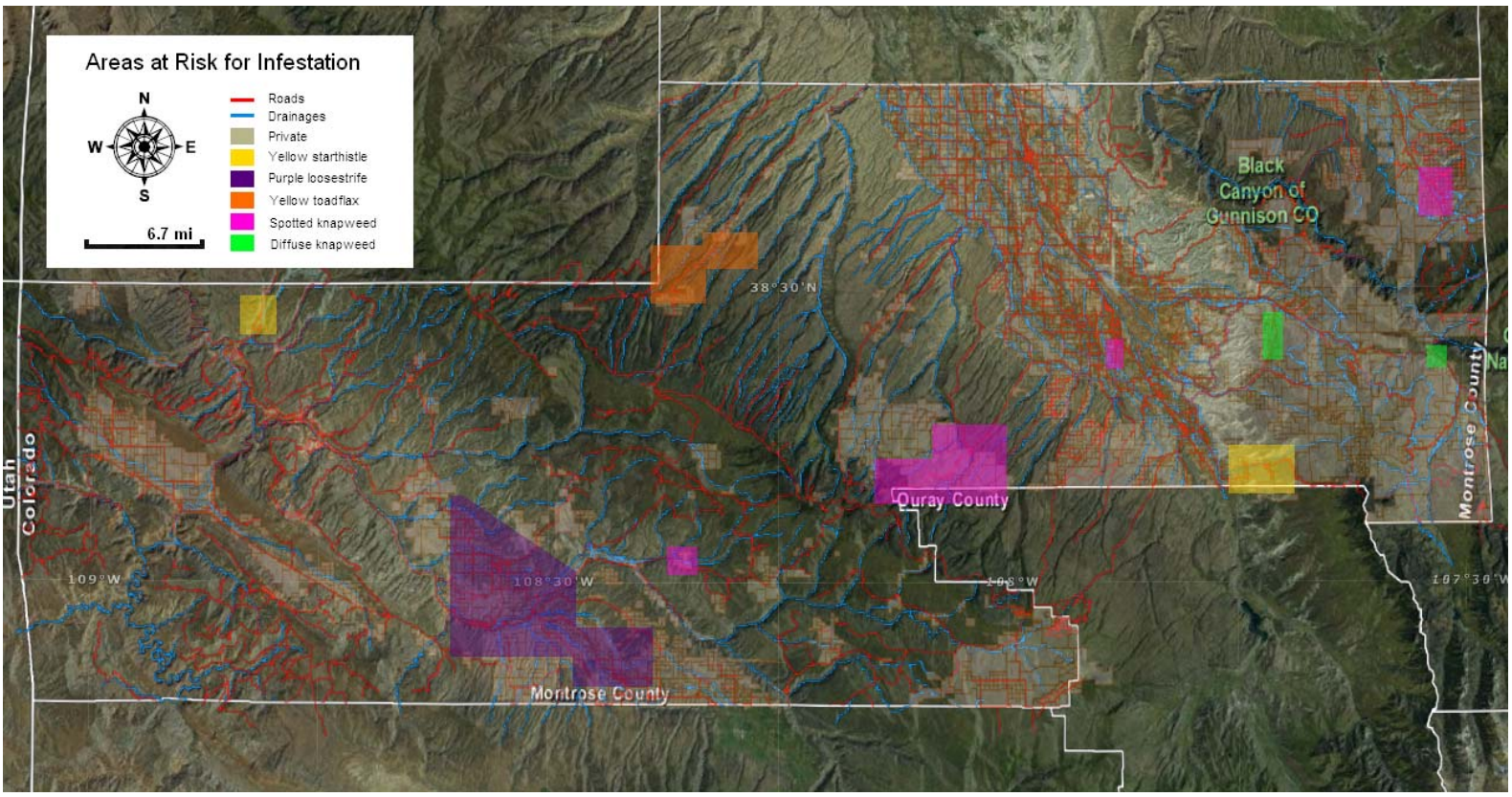
Plants flower at a height between one and three feet and are most effectively controlled using integrated weed management strategies hinging on chemicals with varying modes of action. Effective treatments conducted by the department utilize a "restricted use" chemical called Tordon 22K (picloram) in 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

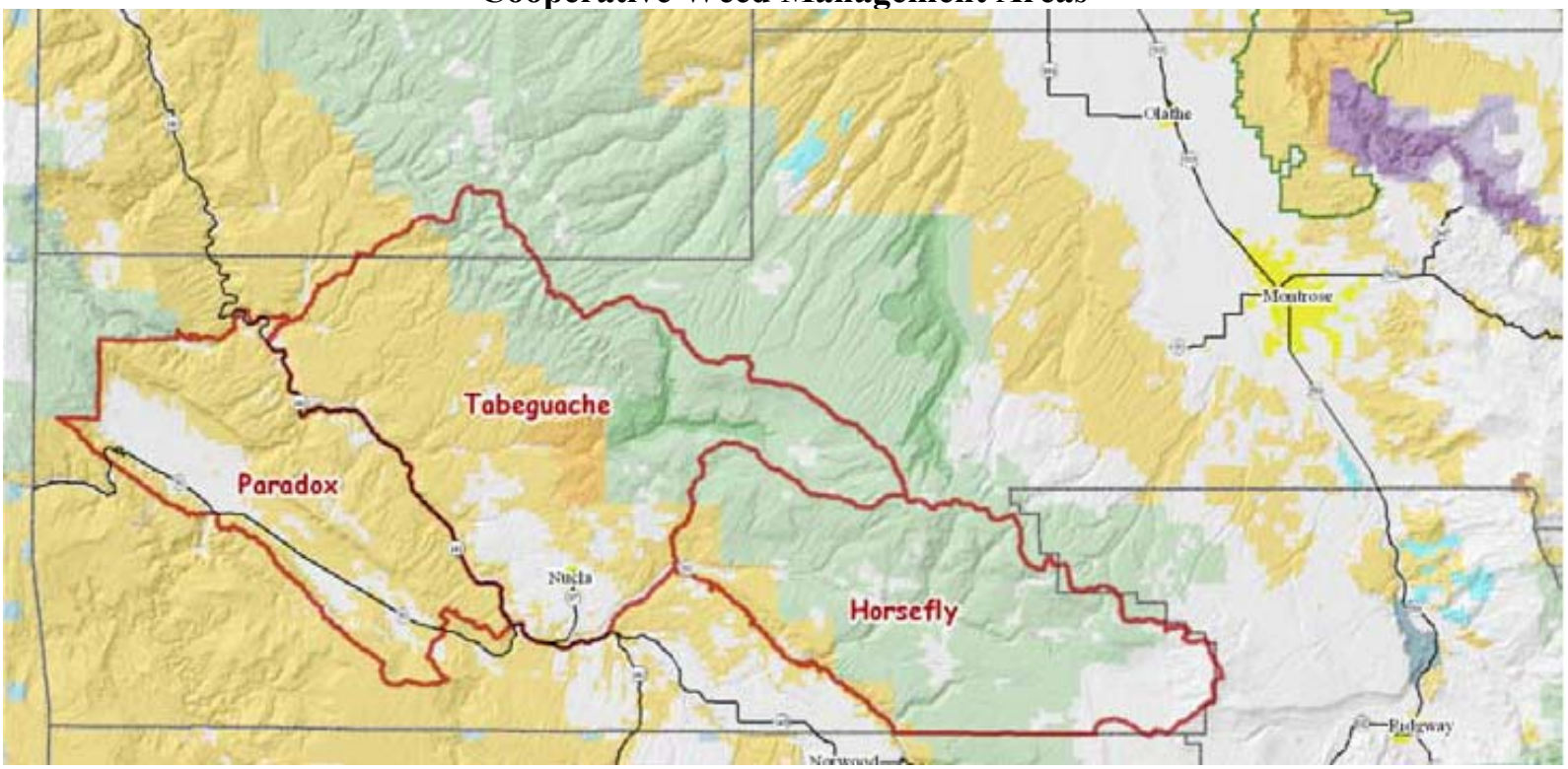
## Uncompahgre Valley Pest Control District



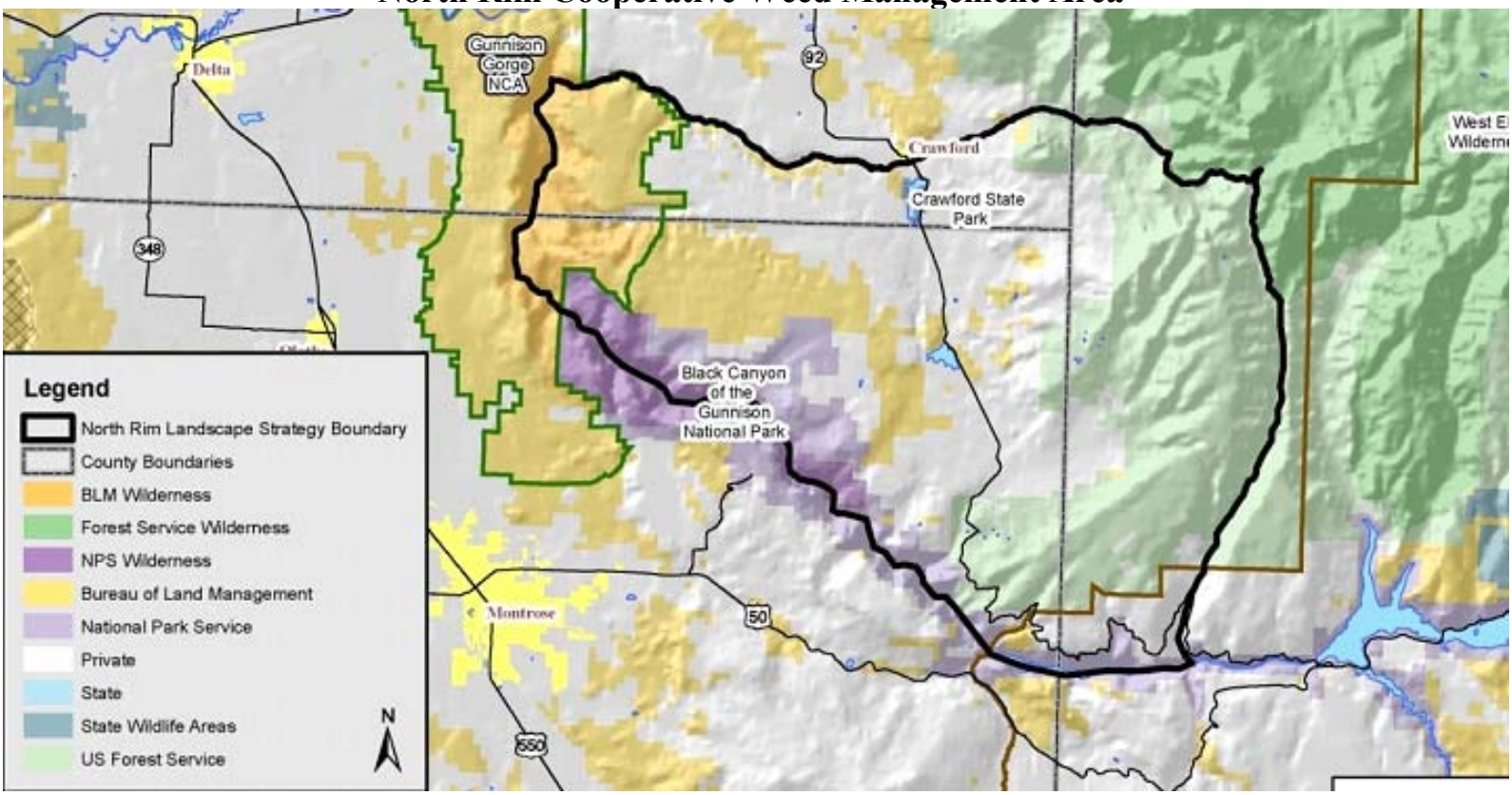

## Areas at Immediate Risk of Infestation



## 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 heath, 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 Statues.

**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.

# ATTACHMENT E

Habitat Impact Evaluation & Methodology

Habitat Impacts on Zanni Lateral of the Crawford Clipper Ditch From Piping

By Michael Zeman
Wildlife and Natural Resource Concepts & Solutions, LLC

July 26, 2013

*Revised October 18, 2015*

The Zanni Lateral Piping Project will replace approximately 1.6 miles of open ditch in the Crawford Clipper Ditch with underground pipe. The project starts in the town of Crawford and extends 1.6 miles to the northwest. The project will parallel Highway 92 on the west side of the road for a short distance, cross underneath it, and will continue on the other side through the backyards of some houses and irrigated farmland. A few areas along the ditch are bordered by drier upland vegetation which includes: pinion, juniper, sagebrush, rabbitbrush, four-winged saltbrush, and yellow clover. Plant species found along the ditch include: narrow leaf cottonwoods, sumac, wild rose, sweet pea, alfalfa, isolated pockets of sedges & cattails, and a number of small forbs & grasses. Few invasive weed species were observed along the ditch. Those found included: Russian olive; Canada thistle; milkweed; chicory; and lambsquarter.

Several sections of the Zanni Lateral are adjacent to irrigated fields or have wastewater ditches flowing alongside them. The proximity of these water sources will help lessen the effect on existing habitat when the open ditch is put into pipe. Many trees along the ditch (such as cottonwoods, willows, and Russian olives) will probably be lost during the construction phase of the project. A few more will die out because of lack of water after the piping goes in. The plant diversity and habitat value along the ditch are somewhat limited because of the closeness of the ditch to houses. Soils used to bury the pipeline, will be replanted with grasses & forbs to help prevent weeds from invading the site. Segments of the ditch within irrigated fields will probably see little difference in use because ranchers will continue to irrigate and farm over the top of the pipeline. Some segments are literally in the back yard of local residents. In these areas, the pipe will have to be buried using minimal space and replanted vegetation may be water when residents water their yards.

Three borrow/staging areas will be utilized in the piping project and will cause a small amount of habitat loss. These areas will need to be smoothed and contour to match surrounding habitat or returned to their original state. If the soils are disturbed, they will need to be replanted with a dryland mixture of grasses and forbs. It is preferable to drill the seed late in the fall and to allow it germinate in the spring when the snow melts off. If the areas are seeded by broadcasting instead of drilling, the amount of seed used will need to be double the amount recommended for drilling.

A total of 5.43 habitat units* are expected to be lost due to the piping of the Zanni Lateral. Impacts to habitat along the lateral can be minimized by: avoiding the removal of trees as much as possible when installing the pipe; proper choice of plants and planting methods when reclaiming the area over the pipeline; and implementing an effective weed control program.

* 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).

**Revised 10/18/15** **Zanni Lateral - Habitat Areas Affected** 7/26/2013

| Habitat Point | Habitat Type | Feet of Ditch | Width of Impact (Ft.) | Acreage of Impact | Amount of Impact | Habitat Credits Lost |
|---|---|---|---|---|---|---|
| H1 | Forest/Shrub-over pipe | 904 | 20 | 0.42 | 0.10 | 0.04 |
| H2 | Forest/Shrub | 1008 | 20 | 0.46 | 0.80 | 0.37 |
| H3 | Grass/Shrub | 990 | 40 | 0.91 | 0.50 | 0.45 |
| H4 | Grass/Shrub | 427 | 25 | 0.25 | 0.30 | 0.07 |
| H5 | Forest/Shrub | | | 1.46 | 1.40 | 2.04 |
| H6 | Shrub/Grass | 827 | 30 | 0.57 | 0.90 | 0.51 |
| H7 | Shrub/Grass | 1519 | 20 | 0.70 | 0.40 | 0.28 |
| H8 | Forest/Shrub | 1041 | 20 | 0.48 | 0.70 | 0.33 |
| H9 | Forest/Shrub | 655 | 20 | 0.30 | 0.60 | 0.18 |
| H10 | Grass/Shrub | 530 | 20 | 0.24 | 0.50 | 0.12 |
| H11 | Grass/Shrub | 507 | 40 | 0.47 | 0.00 | 0.00 |
| H12 | Grass Pasture | 1034 | 40 | 0.95 | 0.00 | 0.00 |
| H13 | Arid Grass/Forb | 448 | 40 | 0.41 | 0.00 | 0.00 |
| Borrow/Stage 1 | Arid Grass/Shrub | | | 3.68 | 0.30 | 1.10 |
| Borrow/Stage 2 | Grass/Shrub | | | 0.99 | 0.00 | 0.00 |
| Borrow/Stage 3 | Arid Grass/Forb | | | 0.44 | -0.20 | -0.09 |
| | | | | | **Habitat Credits Lost** | **5.43** |

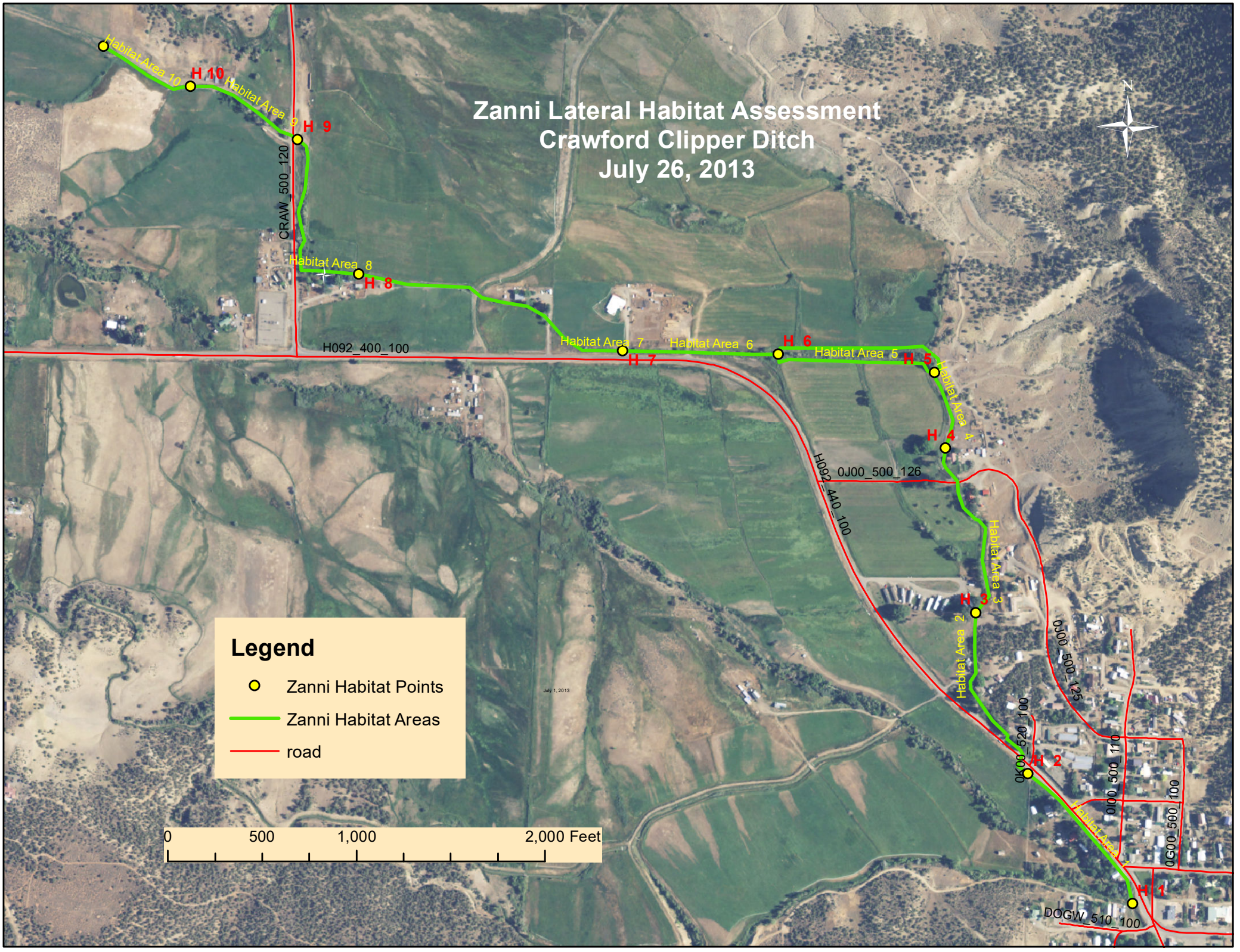
25-Jul-13 **Habitat Quality Scoring**

**Revised 10/18/15** **Zanni Lateral Habitat Work Sheet**

| **Habitat Site** | **H 1** | | **H 2** | | **H 3** | | **H 4** | | **H 5** | | **H 6** | | **H 7** | | **H 8** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mapped Acres/Adjustment** | 0.42 | **100%** | 0.46 | **100%** | 0.91 | **100%** | 0.25 | **100%** | 1.46 | **100%** | 0.57 | **100%** | 0.70 | **100%** | 0.48 | **100%** |
| **Habitat Type** | **Forest/Shrub-pipe** | | **Forest/Shrub** | | **Grass/Shrub** | | **Grass/Scrub** | | **Forest/Shrub** | | **Shrub/Grass** | | **Shrub/Grass** | | **Forest/Shrub** | |
| | Before | After | Before | After | Before | After | Before | After | Before | After | Before | After | Before | After | Before | After |
| **Vegetation Diversity** | 7 | 7 | 8 | 5 | 6 | 5 | 4 | 3 | 10 | 5 | 6 | 4 | 6 | 4 | 7 | 4 |
| **Stratification** | 10 | 10 | 10 | 8 | 10 | 8 | 10 | 10 | 10 | 8 | 10 | 6 | 6 | 6 | 10 | 8 |
| **Native vs. Non-Native species** | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **Noxious Weeds** | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 8 | 9 | 9 | 8 | 9 | 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 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
| **Connectivity** | 1 | 1 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| **Uniqueness or Abundance** | 3 | 2 | 5 | 3 | 4 | 3 | 3 | 2 | 8 | 3 | 6 | 3 | 4 | 2 | 6 | 4 |
| **Water Supply** | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| **Alteration** | 0 | 0 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 3 | 3 | 2 | 2 | 4 | 4 |
| **Raw Scores** | 51 | 50 | 63 | 55 | 60 | 55 | 57 | 54 | 71 | 57 | 62 | 53 | 54 | 50 | 63 | 56 |
| **Habitat Quality Score (HQS)** | **5.1** | **5** | **6.3** | **5.5** | **6** | **5.5** | **5.7** | **5.4** | **7.1** | **5.7** | **6.2** | **5.3** | **5.4** | **5** | **6.3** | **5.6** |
| **Habitat Score Difference** | 0.1 | | 0.8 | | 0.5 | | 0.3 | | 1.4 | | 0.9 | | 0.4 | | 0.7 | |
| **Habitat Credits Lost =** | **0.04** | | **0.37** | | **0.46** | | **0.08** | | **2.04** | | **0.51** | | **0.28** | | **0.34** | |

| **Habitat Site** | **H 9** | | **H 10** | | **H 11** | | **H 12** | | **H 13** | | **Borrow-Stage 1** | | **Borrow-Stage 2** | | **Borrow-Stage 3** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mapped Acres/Adjustment** | 0.30 | **100%** | 0.24 | **100%** | 0.47 | **100%** | 0.95 | **100%** | 0.41 | **100%** | 3.68 | **100%** | 0.99 | **100%** | 0.44 | **100%** |
| | **Shrub/Forest** | | **Grass/Shrub** | | **Grass/Shrub** | | **Grass** | | **Arid Grass/Forb** | | **Arid Shrub/Grass** | | **Grass/Shrub** | | **Arid Grass/Shrub** | |
| | Before | After | Before | After | Before | After | Before | After | Before | After | Before | After | Before | After | Before | After |
| **Vegetation Diversity** | 8 | 6 | 7 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 4 | 4 | 1 | 1 |
| **Stratification** | 10 | 8 | 6 | 6 | 2 | 2 | 2 | 2 | 2 | 2 | 10 | 4 | 2 | 2 | 2 | 2 |
| **Native vs. Non-Native species** | 8 | 8 | 6 | 6 | 7 | 7 | 7 | 7 | 8 | 8 | 4 | 4 | 8 | 8 | 2 | 2 |
| **Noxious Weeds** | 9 | 9 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 0 | 4 | 8 | 8 | 0 | 2 |
| **Overall Vegetative Condition** | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 2 | 2 | 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 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Connectivity** | 5 | 5 | 5 | 5 | 3 | 3 | 5 | 5 | 5 | 5 | 3 | 3 | 3 | 3 | 5 | 5 |
| **Uniqueness or Abundance** | 5 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 3 | 3 | 1 | 1 |
| **Water Supply** | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Alteration** | 3 | 3 | 3 | 3 | 2 | 2 | 5 | 5 | 3 | 3 | 2 | 1 | 0 | 0 | 0 | 0 |
| **Raw Scores** | 63 | 57 | 54 | 49 | 42 | 42 | 48 | 48 | 33 | 33 | 33 | 30 | 38 | 38 | 21 | 23 |
| **Habitat Quality Score (HQS)** | **6.3** | **5.7** | **5.4** | **4.9** | **4.2** | **4.2** | **4.8** | **4.8** | **3.3** | **3.3** | **3.3** | **3** | **3.8** | **3.8** | **2.1** | **2.3** |
| **Habitat Score Difference** | 0.6 | | 0.5 | | 0.0 | | 0.0 | | 0.0 | | 0.3 | | 0.0 | | -0.2 | |
| **Habitat Credits Lost =** | **0.18** | | **0.12** | | **0.00** | | **0.00** | | **0.00** | | **1.10** | | **0.00** | | **-0.09** | |

**Total Habitat Credits Lost** **5.43**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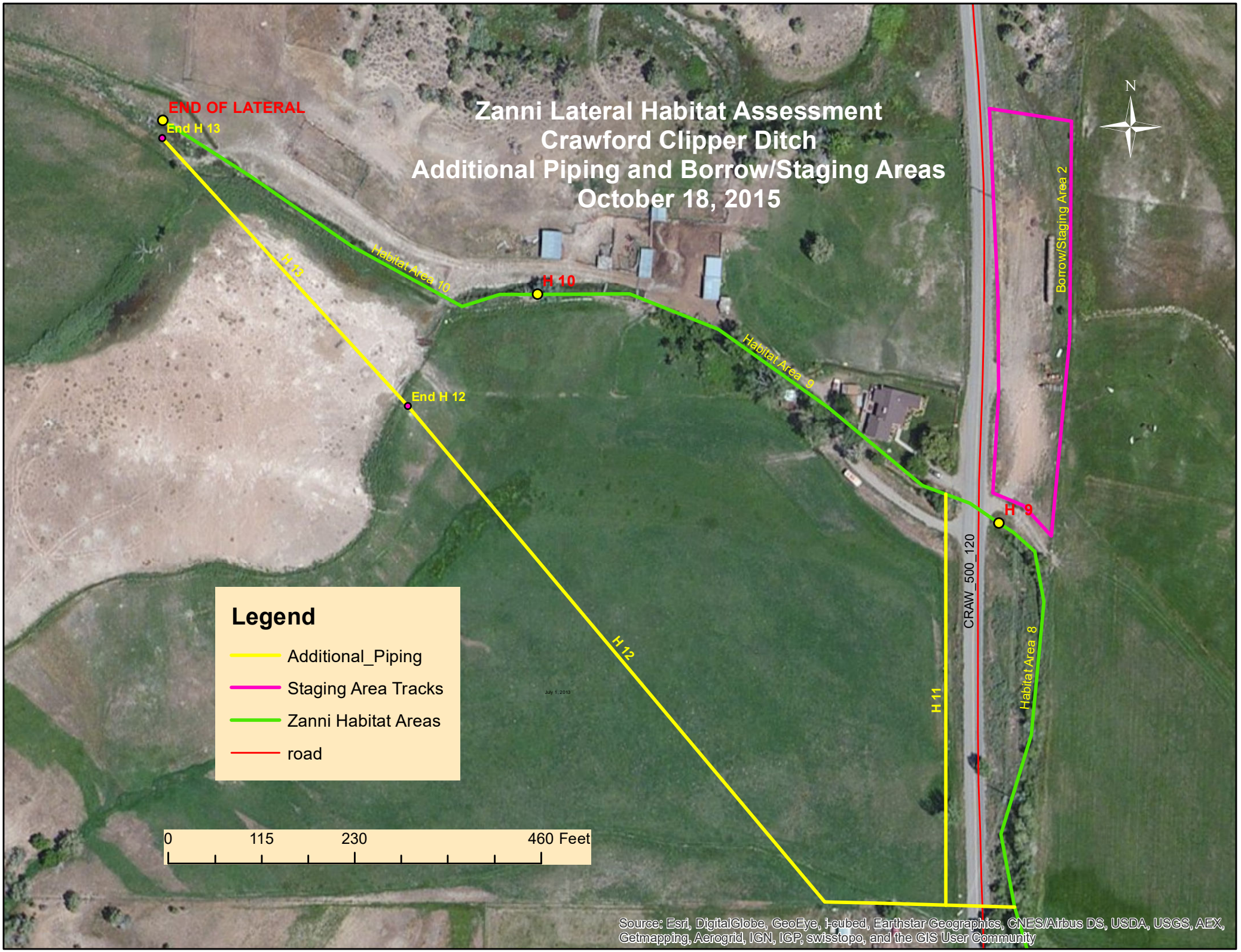
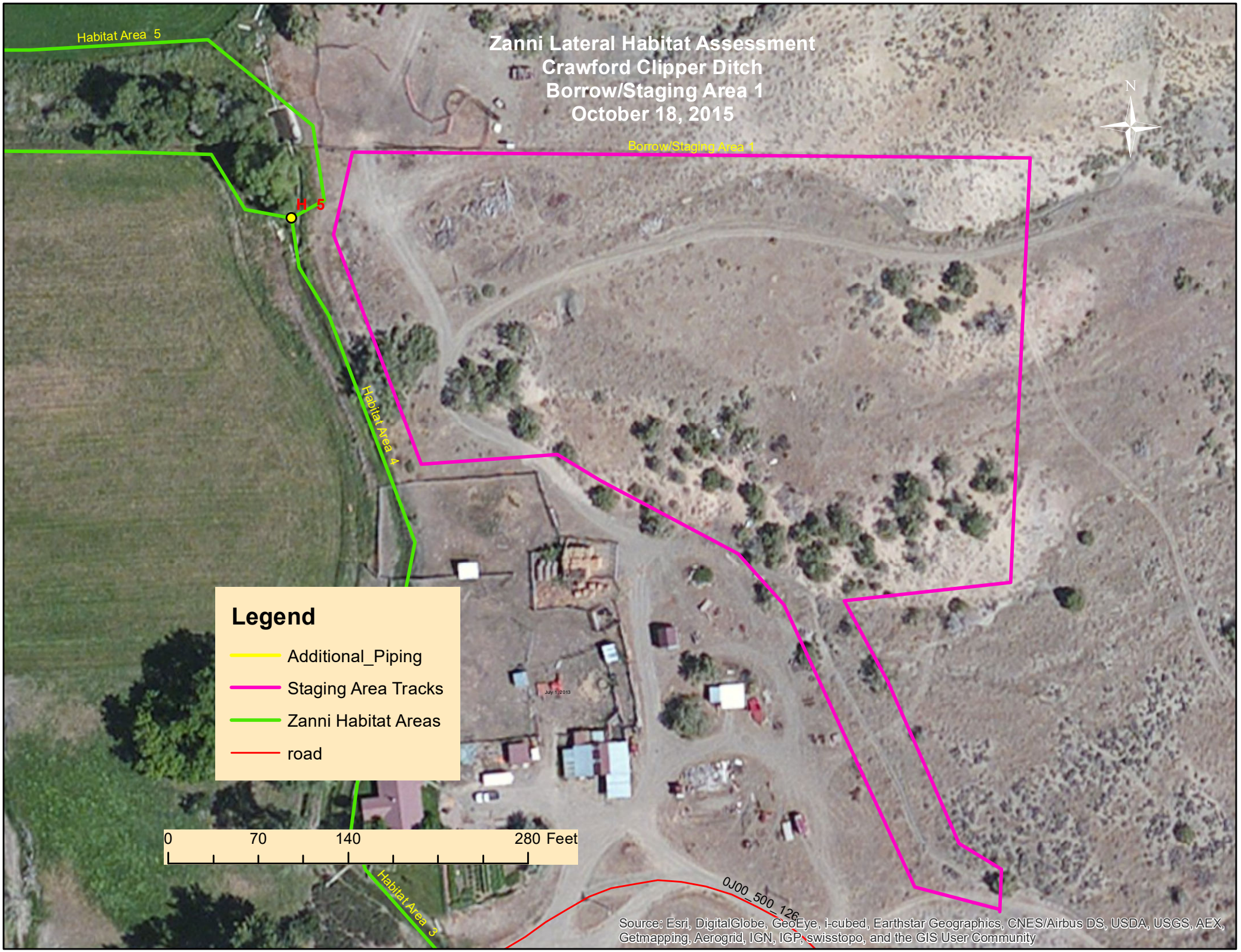
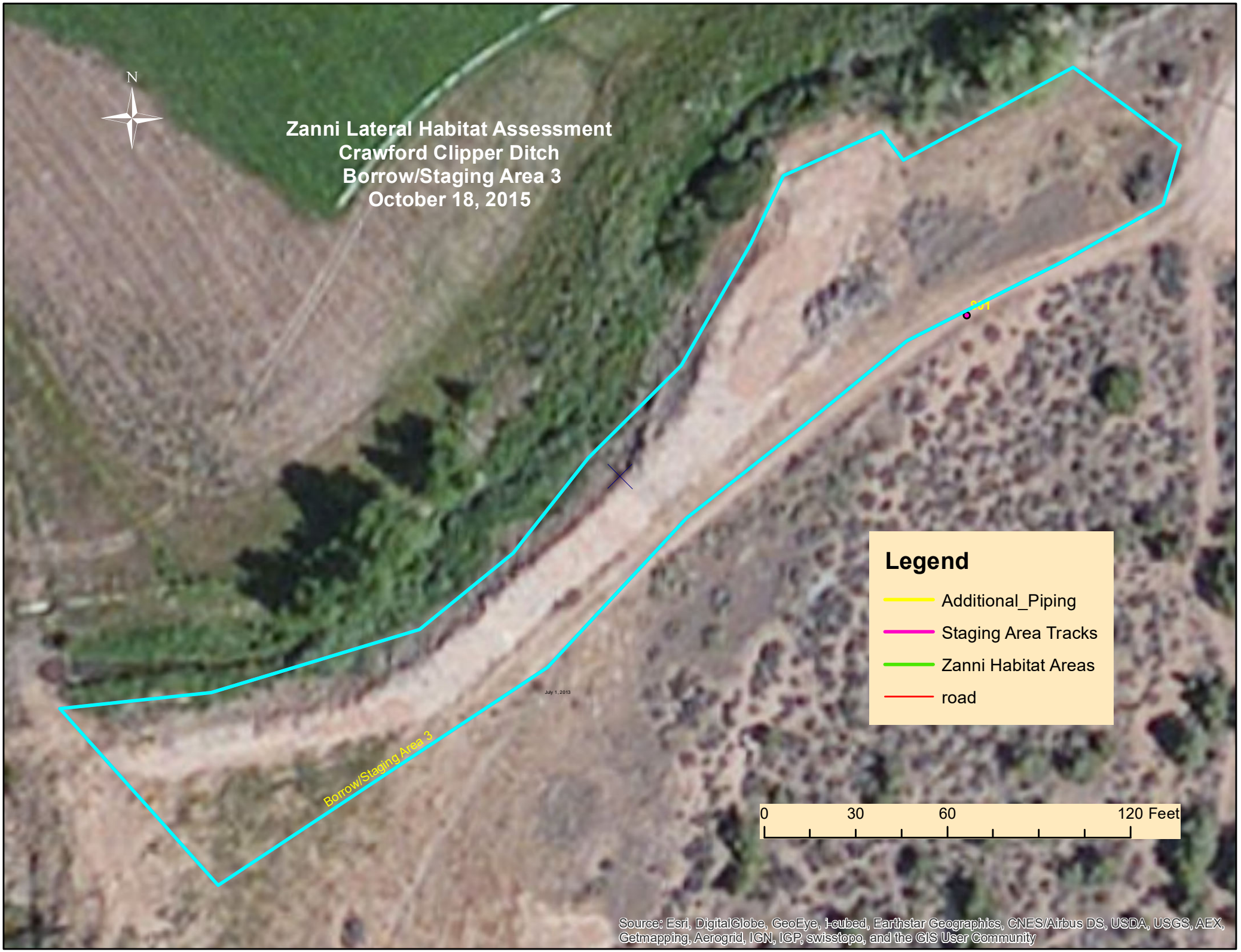
Crawford Clipper Ditch
July 26, 2013
Habitat Area 10
H 10
Habitat Area 9
H 9
CRAW_500_120
Habitat Area 8
H 8
H092_400_100
Habitat Area 7
H 7
Habitat Area 6
H 6
Habitat Area 5
H 5
Habitat Area 4
H 4
H092_440_100
0J00_500_126
Habitat Area 3
H 3
Habitat Area 2
0K00_520_100
H 2
0J00_500_125
0000_500_110
0G00_500_100
Habitat Area 1
H 1
DOGW 510_100
Legend
Zanni Habitat Points
Zanni Habitat Areas
road
0
500
1,000
2,000 Feet


Zanni Lateral Habitat Assessment
Crawford Clipper Ditch
Additional Piping and Borrow/Staging Areas
October 18, 2015
END OF LATERAL
End H 13
H 13
Habitat Area 10
H 10
Habitat Area 9
End H 12
H 12
H 11
CRAW_500_120
H 9
Borrow/Staging Area 2
Habitat Area 8
N
Legend
Additional_Piping
Staging Area Tracks
Zanni Habitat Areas
road
0
115
230
460 Feet
Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community


Zanni Lateral Habitat Assessment
Crawford Clipper Ditch
Borrow/Staging Area 1
October 18, 2015
Habitat Area 5
Borrow/Staging Area 1
H 5
Habitat Area 4
Habitat Area 3
0J00_500_126
N
Legend
Additional_Piping
Staging Area Tracks
Zanni Habitat Areas
road
0
70
140
280 Feet
Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community


N
Zanni Lateral Habitat Assessment
Crawford Clipper Ditch
Borrow/Staging Area 3
October 18, 2015
Legend
Additional_Piping
Staging Area Tracks
Zanni Habitat Areas
road
0
30
60
120 Feet
Borrow/Staging Area 3
Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

# ATTACHMENT F

Habitat Replacement Plan

**Hart Ranch**
**Proposed Habitat Replacement Site**
**For Crawford Clipper Ditch and Zanni Lateral Piping Projects**
**October 30, 2013**
**Revised October 23, 2015**

The Crawford Clipper Ditch Company will be piping two segments of the Crawford Clipper Ditch. The first project will involve piping approximately 4 miles of the lower portion of the ditch. The project is located about 2.5 miles southeast of Hotchkiss and will cross irrigated farmland and arid, adobe lands. The second project will be piping the Zanni Lateral of the Crawford Clipper Ditch. This project starts in the town of Crawford and extends 1.6 miles to the northwest. The project will parallel Highway 92 on the west side of the road for a short distance, cross underneath it, and will continue on the other side through the backyards of some houses and irrigated farmland. Habitat will be lost during the piping of these ditch segments and the Bureau of Reclamation requires that it be replaced. It is estimated that 9.99 habitat credits* will be lost in the piping of the lower Crawford Clipper Ditch. The Zanni Lateral piping project will result in the loss of an additional 5.43 habitat credits for a total of 15.42 habitat credits. Two habitat improvement projects have been proposed to offset these losses. The sites for the projects are located on the Hart Ranch near Highway 92 and the Crawford CDOT facility. This is approximately 1.2 miles south of Crawford Reservoir and the projects will improve approximately 9.5 acres of wetland habitat. The project areas, as well as much of the Hart Ranch, are held in a conservation easement. The existing habitat at the sites are mostly a monoculture of cattails & reeds with some willows, on the edge of a grass pasture. Waste water from irrigated fields above the sites will provide water for the projects. Other water can also be directed to the sites from a number of nature springs found on the property. When completed, the two habitat projects will create approximately 15.56 habitat credits. This satisfies the habitat replacement requirement and will leave 0.14 habitat credits available for future piping projects..

The proposed CDOT project would include excavating three potholes in the cattail monoculture. Trees and shrubs would be planted around the potholes to help create more structure and diversity in habitat. This vegetation would be protected from wildlife and livestock by putting in steel t-posts around the plantings and wrapping them with woven wire. An improved stock pond area would be built on the south side to provide water for cattle while helping to keep them out of the wetlands. Tree and shrub species to be planted would include sumac, native plum, golden currant, and chokecherry. After the trees and shrubs are well established the enclosures could be removed. An invasive weed control plan would be developed and implemented for the site. Invasive weeds are not a huge problem at this time but Canada thistle and Russian olive are common. The landowner is willing to do the weed treatment and would be reimbursed for chemicals and supplies needed for the first five years after the project is constructed.

The Tower Pond site is located to the southwest of the CDOT site and has similar habitat. It is an existing pond that is smaller and has been filling in with cattails. This wetland would be cleaned out and slightly enlarged. A water control structure would be installed above the pond, allowing water to either be diverted into the wetland or bypass it allowing the water to flow back into Alkali Creek. This would be extremely helpful in reducing the amount of sedimentation that builds up in the pond. A tree and shrub planting area would be built on the east side of the pond and will be enclosed with a 8 foot high game damage fence to exclude livestock and wildlife. Tree and shrub species planted here would be similar to those planted on the CDOT site. The water control structures put on the diversion ditch would also allow irrigation water to be routed to the vegetative plantings. Colorado Parks and Wildlife asked that no large trees be planted (for example: cottonwoods and alder) because the area is near the edge

of habitat used by Gunnison Sage Grouse. Canada thistle, Russian olive and knapweed are prevalent invasive weed species found in the area around the pond and their treatment will be included in the weed management plan.

These two habitat projects will fulfill the habitat replacement requirements for the piping of the lower portion of the Crawford Clipper Ditch and the Zanni Lateral. The potholes and additional vegetative plantings should draw more waterfowl, song birds, and shore birds as well as providing feed & cover for a number of small mammals. The area is already used by many species of wildlife but the habitat projects should provide more diversity.

*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).

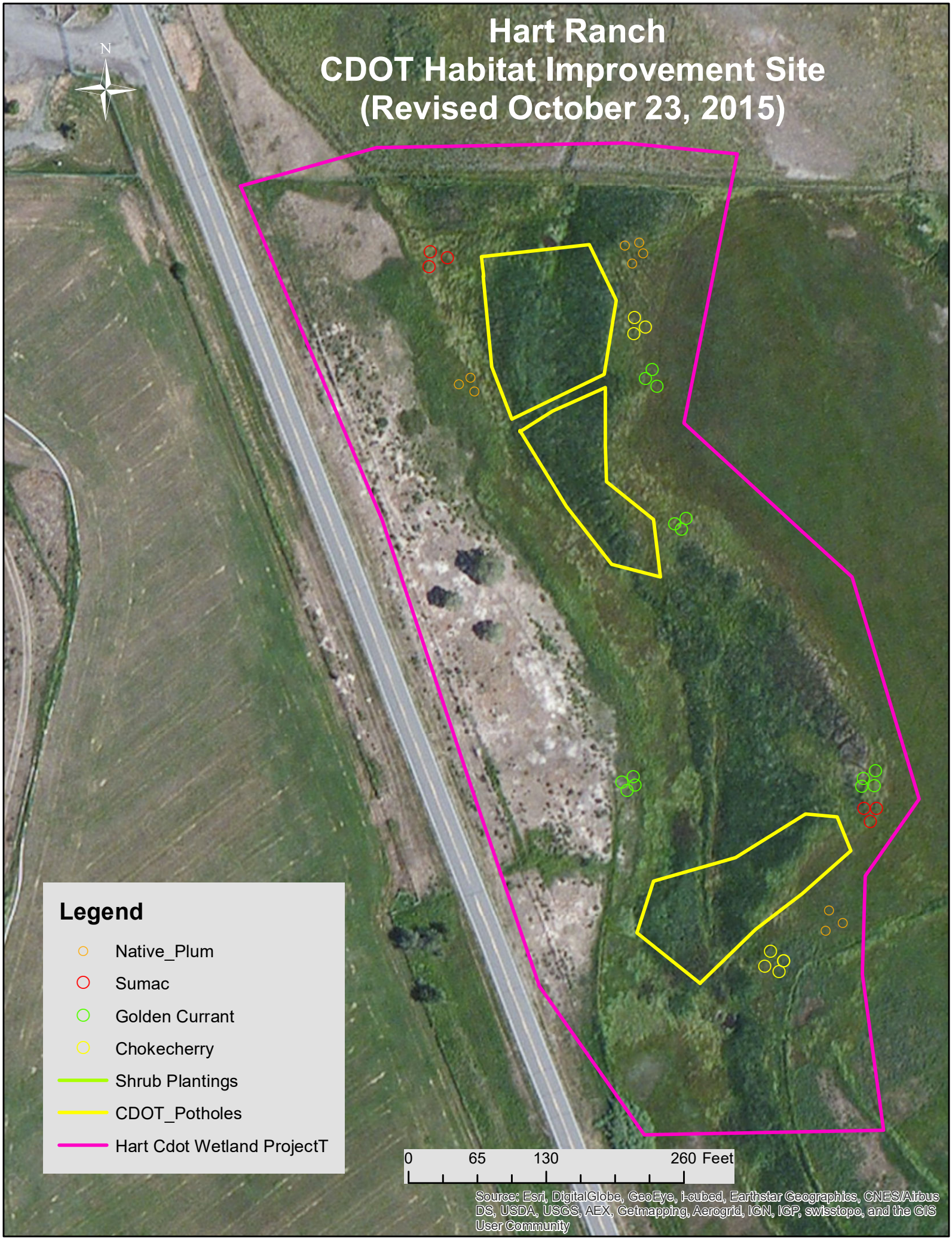
**Habitat Quality Scoring**

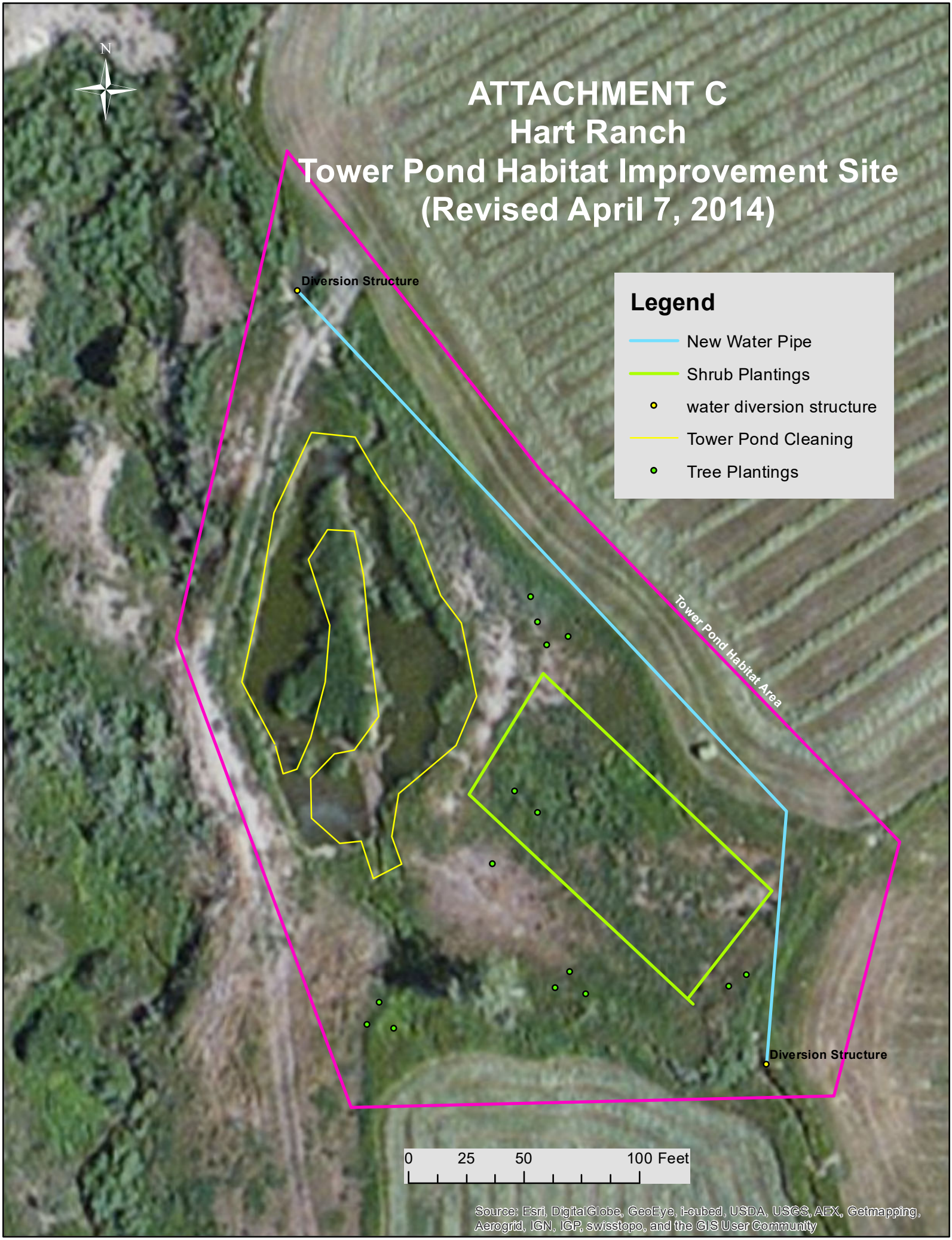
Revised 10/23/15

**Hart Ranch - CDOT & Powerline Wetlands**

| **Habitat Site** | **CDOT Wetland** | | **Tower Pond Wetland** | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Mapped Acres/Adjustment** | 7.89 | **100%** | 1.68 | **100%** | | **100%** | | **100%** |
| | Before | After | Before | After | Before | After | Before | After |
| **Vegetation Diversity** | 4 | 7 | 3 | 8 | | | | |
| **Stratification** | 6 | 10 | 8 | 10 | | | | |
| **Native vs. Non-Native species** | 7 | 8 | 6 | 8 | | | | |
| **Noxious Weeds** | 7 | 9 | 7 | 9 | | | | |
| **Overall Vegetative Condition** | 10 | 10 | 10 | 10 | | | | |
| **Disease Additional scoring** | 0 | 0 | 0 | 0 | | | | |
| **Interspersion of open water** | 1 | 5 | 2 | 4 | | | | |
| **Connectivity** | 10 | 10 | 10 | 10 | | | | |
| **Uniqueness or Abundance** | 4 | 6 | 5 | 8 | | | | |
| **Water Supply** | 6 | 6 | 4 | 6 | | | | |
| **Alteration** | 4 | 4 | 8 | 8 | | | | |
| **Raw Scores** | 59 | 75 | 63 | 81 | 0 | 0 | 0 | 0 |
| **Habitat Quality Score (HQS)** | **5.9** | **7.5** | **6.3** | **8.1** | **0** | **0** | **0** | **0** |
| **Habitat Score Difference** | 1.6 | | 1.8 | | 0 | | 0 | |

| | | |
|---|---|---|
| **Expected Habitat Credits Produced** | **12.62 Credits** | **3.02 Credits** |
| **Total Expected Habitat Credits** | **15.65 Credits** | |


Hart Ranch
CDOT Habitat Improvement Site
(Revised October 23, 2015)
N
Legend
Native_Plum
Sumac
Golden Currant
Chokecherry
Shrub Plantings
CDOT_Potholes
Hart Cdot Wetland ProjectT
0
65
130
260 Feet
Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community


N
ATTACHMENT C
Hart Ranch
Tower Pond Habitat Improvement Site
(Revised April 7, 2014)
Diversion Structure
Legend
New Water Pipe
Shrub Plantings
water diversion structure
Tower Pond Cleaning
Tree Plantings
Tower Pond Habitat Area
Diversion Structure
0
25
50
100 Feet
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

# ATTACHMENT G

RESERVED FOR Endangered Species Act Compliance Documents

# ATTACHMENT H

Cultural Resources Compliance Documents

HISTORY Colorado

October 13, 2015

Ed Warner
Area Manager, Upper Colorado Region
Western Colorado Area Office
Bureau of Reclamation
445 West Gunnison Ave., Suite 221
Grand Junction, CO 81501

Re: Zanni Lateral of the Crawford Clipper Ditch Piping Project, Delta County, Colorado (CHS # 69087)

Dear Mr. Warner:

Thank you for your correspondence dated October 7, 2015 and received by our office on October 8, 2015 regarding the above referenced project under Section 106 of the National Historic Preservation Act (Section 106). We have received and reviewed Alpine Archaeological Consultants, Inc.'s report titled, *Cultural Resource Inventory of the Zanni Lateral of the Crawford Clipper Ditch And Six Block Areas for Staging or Borrows: Delta County, Colorado* (Document # DT.R.R23) and associated site forms.

After review of the provided documentation, we do not object with the proposed Area of Potential Effect (APE) encompassing a 100-ft-wide corridor centered on 1.9 miles of the ditch and proposed pipeline route, as well as six block areas to be used for staging or soil borrowing during construction.

We concur that 5DT.1811.3 is a non-supporting segment to National Register of Historic Places (NRHP) eligible resource 5DT.1811. We concur that 5DT.1584.3 is a non-supporting segment to NRHP ineligible resource 5DT.1584. We concur that the project will result in a finding of no adverse effect under Section 106.

Should unidentified archaeological resources be discovered in the course of the project, work must be interrupted until the resources have been evaluated in terms of the NRHP eligibility criteria (36 CFR 60.4) in consultation with our office.

We request being involved in the consultation process with the local government, which as stipulated in 36 CFR 800.3 is required to be notified of the undertaking, and with other consulting parties. Additional information provided by the local government or consulting parties might cause our office to re-evaluate our eligibility and potential effect findings.

If we may be of further assistance, please do not hesitate to contact Katie Arntzen, our Section 106 Compliance Manager, at (303) 866-4608 or katie.arntzen@state.co.us.

Sincerely,

Steve Turner
State Historic Preservation Officer

HISTORY Colorado



October 26, 2015

Ed Warner
Area Manager, Upper Colorado Region
Western Colorado Area Office
Bureau of Reclamation
445 West Gunnison Avenue, Suite 221
Grand Junction, CO 81501

Re: Zanni Lateral of the Crawford Clipper Ditch Piping Project, Montrose and Delta County, Colorado (CHS # 69087)

Dear Mr. Warner:

Thank you for your correspondence dated October 20, 2015 and received by our office on October 22, 2015 regarding the addendum to the above referenced project under Section 106 of the National Historic Preservation Act (Section 106). We have received and reviewed Alpine Archaeological Consultants, Inc.'s limited-results report titled, *Addendum Cultural Resource Report for the Zanni Lateral of the Crawford Clipper Ditch Piping Project, Montrose and Delta Counties, Colorado.*

After review of the provided documentation, we do not object with the proposed Area of Potential Effect (APE) encompassing a 100-ft-wide corridor centered on two ditch reroute centerlines, three block areas to be used for staging or soil borrowing during construction and a habitat replacement site. We concur that the project will result in a finding of no adverse effect under Section 106.

Should unidentified archaeological resources be discovered in the course of the project, work must be interrupted until the resources have been evaluated in terms of the National Register of Historic Places eligibility criteria (36 CFR 60.4) in consultation with our office.

We request being involved in the consultation process with the local government, which as stipulated in 36 CFR 800.3 is required to be notified of the undertaking, and with other consulting parties. Additional information provided by the local government or consulting parties might cause our office to re-evaluate our eligibility and potential effect findings.

If we may be of further assistance, please do not hesitate to contact Katie Arntzen, our Section 106 Compliance Manager, at (303) 866-4608 or katie.arntzen@state.co.us.

Sincerely,

Steve Turner, AIA
State Historic Preservation Officer

# ATTACHMENT I

RESERVED FOR Environmental Commitment Plan