RECLAMATION

Managing Water in the West

Environmental Assessment
Austin Canal Replacement Salinity Control Project
Uinta County, Wyoming

PRO-EA-013-005

Provo Area Office
Upper Colorado Region
Provo, Utah

U.S. Department of the Interior
Bureau of Reclamation
Provo Area Office
Provo, Utah

September 2015

Mission Statements

The mission of the Department of the Interior is to protect and manage the Nation's natural resources and cultural heritage; provide scientific and other information about those resources; and honor its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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Provo Area Office
Upper Colorado Region
Provo, Utah

prepared by *Bureau of Reclamation*
Provo Area Office
Provo, Utah

U.S. Department of the Interior
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Provo Area Office
Provo, Utah

FINDING OF NO SIGNIFICANT IMPACT

Environmental Assessment Austin Canal Replacement Salinity Control Project
Uinta County, Wyoming

Recommended by:

Beth Reinhart
Chief, Environmental Group

9/14/15
Date

Concur:

Mary Halverson
Acting Manager, Water and Environmental
Resources Division

9-14-15
Date

Approved by:

Wayne G. Pullan
Area Manager, Provo Area Office

14 SEP 2015
Date

Introduction

In compliance with the National Environmental Policy Act of 1969, as amended (NEPA), the Bureau of Reclamation's, Provo Area Office has conducted an Environmental Assessment (EA) for a Proposed Action to provide funding to the Austin/Wall Irrigation District (District) for replacing approximately 6 miles of the Austin Canal (Canal) with a buried HDPE pipeline. Reclamation is responsible for implementing salinity control projects for the Colorado River Basin and is the lead agency for the purposes of compliance with the NEPA for this proposed action. The cooperating agency for this NEPA analysis is the Bureau of Land Management (BLM).

The EA was prepared by Reclamation to address the impacts associated with replacing a section of the Canal with a buried HDPE pipeline. The purpose of the Proposed Action is to eliminate seepage losses and to allow for a higher percentage of diverted water to reach points of use. This will allow for improved irrigation success on fields and pastures and increased growth of grass and crops. The need for this project is to reduce salt loading to the Colorado River System.

Alternatives

The EA analyzed the No Action Alternative and the Proposed Action of replacing 6 miles of the open Canal with a buried HDPE pipeline. The decision is to implement the Proposed Action. Environmental commitments that are integral to the Proposed Action are as follows:

1. **Additional Analysis.** If the Proposed Action were to change significantly from what is described in this document, additional environmental analyses will be undertaken as necessary.

2. **Cultural Resources.** Per Wyoming State Historic Preservation Office, if any cultural materials are discovered during construction, work in the area shall halt immediately, the lead Federal agency must be contacted, and the materials evaluated by an archaeologist or historian meeting the Secretary of the Interior's Professional Qualification Standards (48 FR 22716, Sept. 1983).

3. **Paleontological Resources.** Monitoring will be conducted during construction activities that impact a previously undisturbed bedrock layer. If any mineralized bones or other potentially significant fossils are discovered by project personnel during construction activities, fossils will be left in place untouched and Reclamation will be notified.

4. **Construction Activities Confined to Surveyed Corridor.** All construction activities will be confined to areas previously surveyed for cultural, paleontological, and biological resources.

5. **Roads.** Existing roads will be used whenever possible for project activities. Access will also be required along the proposed pipeline route during construction.

6. **Disturbed Areas.** Topsoil in areas to be excavated will be stripped, stockpiled, and replaced in order to provide a seed bed during Reclamation activities. Reclaimed areas will be shaped and contoured to blend with the surrounding area. Seeding activities will utilize weed-free seed mixes of native plants and agricultural grasses approved by Reclamation biologist and will occur at appropriate times.

7. **Air Quality.** Best Management Practice's (BMP's) will be utilized to control dust caused by construction activities.

8. **Habitat Replacement.** A plan to replace the wildlife habitat eliminated by this project will be created and approved by Reclamation, in coordination with the Service and the Wyoming Game and Fish Department. A proposed replacement property will be acquired and improvements to that property will equal or exceed the values of the habitat lost due to project implementation. The Habitat Replacement Plan will be approved and initiated prior to project completion and final payment of construction funds, in accordance with salinity control program procedures.

9. To comply with the Migratory Bird Treaty Act, vegetation (i.e., trees, shrubs, and herbaceous plants) will not be removed during the bird breeding season (March through August, depending on the species of concern and weather in a given year). If construction will occur during this time period, bird nest clearance surveys will be done by a qualified biologist to verify the absence of nests prior to vegetation removal. If nests are found, further coordination with the Service or Reclamation will be required. Construction activities occurring completely outside the nesting season do not necessitate surveys.

10. If construction occurs during the raptor nesting season (January 1 through September 30), the inactive nests described in this report will be checked for signs of nesting activity. If the nest is occupied, the nesting species will be determined by a qualified biologist, and the appropriate seasonal and spatial buffer, as identified by the Service's Wyoming Field Office, will be applied.

11. Although no infestations of noxious or invasive weeds were identified on the project centerline, ground disturbance will often result in the establishment of plant pests. BMP's, such as weed treatment prior to construction and equipment cleaning, will be implemented as part of this project.

12. If land is not grubbed during seasons of inactivity of passerine birds, a qualified biologist will have to survey to the area to ensure that construction will not affect passerine birds or raptors.

Related NEPA Documents

Environmental Impact Statements or Environmental Assessments that are related to, but not part of the scope of this EA, include the Kemmerer Resource Management Plan Final Environmental Impact Statement.

Decision and Finding of No Significant Impact

Based upon a review of the EA and supporting documents, I have determined that implementing the Proposed Action will not significantly affect the quality of the human environment, individually or cumulatively with other actions in the area. No environmental effects meet the definition of significance in context or intensity as defined at 40 CFR 1508.27. Therefore, an environmental impact statement is not required for this proposed action. This finding is based on consideration of the context and intensity as summarized here from the EA.

Context

The affected locality is Uinta County, Wyoming. Affected interests include the cooperating agency plus the District.

Intensity

The following discussion is organized around the 10 significance criteria described in 40 CFR 1508.27. These criteria were incorporated into the resource analysis and issues considered in the EA.

1. **Impacts may be both beneficial and adverse.** The Proposed Action will impact resources as described in the EA. Environmental commitments to reduce impacts to cultural resources, paleontological resources, and biological resources were incorporated into the design of the Proposed Action. The following short-term effects of the Proposed Action are predicted: road closures, noise, and ground disturbance along the Canal alignment. Long-term predicted effects are wildlife habitat loss (mitigated for in the Habitat Replace Plan). Adverse and beneficial effects include salt loading reduction to the Colorado River, eliminate seepage losses and to allow for a higher percentage of diverted water to reach points of use.

None of the environmental effects discussed in detail in the EA are considered significant.

2. **The degree to which the selected alternative will affect public health or safety or a minority or low-income population.** The Proposed Action will have no significant impacts on public health or safety. No minority or low income community will be disproportionately affected by the Proposed Action.

3. **Unique characteristics of the geographic area.** Any wetlands or other wildlife habitat that will be impacted by the Proposed Action will be mitigated for under the Habitat Replacement Plan. There are no park lands, prime farmlands, wild and scenic rivers, or other ecologically critical areas that will be affected by the proposal.

4. **The degree to which the effects on the quality of the human environment are likely to be highly controversial.** Reclamation contacted representatives of other federal agencies, state and local governments, Indian tribes, public and private organization, and individuals regarding the Proposed Action and its effects on resources. Based on the responses received, the effects from the Proposed Action on the quality of the human environment are not highly controversial.

5. **The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.** When uncertainty about impacts to the human environment was identified in the EA, mitigation and monitoring measures were identified and included in the formulation of the alternatives. There are no predicted effects on the human environment that are considered highly uncertain or that involve unique or unknown risks.

6. **The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.** The Proposed Action will not establish a precedent for future actions with significant effects.

7. **Whether the action is related to other actions which are individually insignificant but cumulatively significant.** Cumulative impacts are possible when the effects of the Proposed Action are added to other past, present, and reasonably foreseeable future actions as described under Related NEPA Documents above; however, significant cumulative effects are not predicted, as described in the EA.

8. **The degree to which the action may adversely affect sites, districts, buildings, structures, and objects listed in or eligible for listing in the National Register of Historic Places.** The State Historic Preservation Officer and has concurred with a determination of no historic properties affected by the Proposed Action.

9. **The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.** Although listed species are present within the project boundary, they will not be affected because suitable habitat for the listed species does not occur within project area. Reclamation's finding was No Effect.

10. **Whether the action threatens a violation of Federal, state, local, or tribal law, regulation or policy imposed for the protection of the environment.** The project does not violate any federal, state, local, or tribal law, regulation, or policy imposed for the protection of the environment. In addition, this project is consistent with applicable land management plans, policies, and programs.

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Chapter 1 Purpose and Need for the Proposed Action

1.1 Introduction

This document is an Environmental Assessment (EA) analyzing the potential effects of the Austin Canal Replacement Project, located in Uinta County, Wyoming. The proposed project would replace a section of the Austin Canal (Canal) with a pipeline.

The Bureau of Reclamation has prepared the Final EA to comply with procedural requirements of the National Environmental Policy Act of 1969 (NEPA), Public Law 91-90, as amended, the Council on Environmental Quality and Department of the Interior regulations implementing NEPA. This EA analyzes the potential impacts of the Proposed Action (replacing a section of the Canal with a buried HDPE pipeline) in comparison with a No Action Alternative. Under the No Action Alternative, the existing Canal would remain unchanged. As required by NEPA implementing regulations, if significant impacts to the human environment are identified, an Environmental Impact Statement would need to be prepared. If no significant impacts are identified, Reclamation will issue a Finding of No Significant Impact (FONSI).

1.2 Purpose and Need for the Proposed Action

The Austin/Wall Irrigation District (District) is proposing to replace a section of the Canal with a buried HDPE pipeline. The purpose of the proposed project is to eliminate seepage losses and to allow for a higher percentage of diverted water to reach the points of use. This would allow for improved irrigation success on fields and pastures and increased growth of grass and crops. The need for this project is to reduce salt loading to the Colorado River System.

1.3 Decision to be Made

Reclamation will decide whether or not to provide funding for replacing a section of the Canal with a buried HDPE pipeline. The Bureau of Land Management, as a cooperating agency, will decide whether or not to allow the District to replace the Canal with a HDPE pipeline on its lands.

1.4 Project Background

1.4.1 Colorado River Basin Salinity Control Program (CRBSCP)

The Colorado River Basin Salinity Control Act was enacted in 1974, and was later amended into the program as it now stands. The objective of the CRBSCP is to minimize the salt loading in the Colorado River system for uses within the United States and Mexico. Increases in salt loading in the river system have resulted in additional costs to municipal, industrial, and agricultural water users in the Lower Basin. It has been found to be more cost effective to reduce the salt loading at the source than to remove the salt downstream. According to Reclamation, economic damages due to salt loading in the Colorado River are estimated to be more than $350 million annually (BOR FOA No. R12SF40034).

The majority of the salt load reduction projects involve the implementation of measures on private agricultural lands. Roughly one half of the salt load in the river system is human-induced, while the remaining portion is introduced by natural sources.

Areas capable of a salt load reduction estimate are eligible for funding through the CRBSCP. A salt load reduction estimate has been provided in the last two Funding Opportunity Announcements (FOA) for the West Blacks Fork Wyoming area, which includes "agricultural lands along the Blacks Fork River upstream of its confluence with the Smith Fork River and near the towns of Fort Bridger and Lyman, Wyoming" (BOR FOA No. R12SF40034). These estimates are provided only where a salinity study has been previously completed by Reclamation, the Natural Resources Conservation Service (NRCS), or the U.S. Geological Survey (USGS). According to Reclamation, the entire area described has been assigned a salt loading factor based on salinity test data from the previously mentioned confluence. There are no sub-areas with varying salt loading factors (BOR FOA No. R12SF40034).

1.4.2 Project Information

The Canal is located in Uinta County near the town of Lyman, Wyoming (see Figure 1.1 Study Area). The area is dry and cold with an average annual precipitation of 8 to 10 inches and a growing season of 90 to 110 days. Crops grown are primarily native hay and pasture.

The Canal is known officially as Uinta Canal No. 3. A Level II Phase II study (Sunrise Engineering, Inc. 2013) was completed in September 2013, by Sunrise Engineering, Inc., for the Wyoming Water Development Office (WWDO). The study evaluated seepage losses from the canals and reviewed various potential improvements to address the seepage. Salinity impacts, cost estimates, and financing options were also addressed. The study determined that the preferred alternative would be to pipe the lower portion of the Canal using funds obtained

mainly from Reclamation and WWDO. Reclamation funding is through the CRBSCP.

The Canal was originally permitted in 1909, to divert water from the Black's Fork River for stock and domestic purposes and irrigation of more than 41,000 acres. The area served by the Canal has been reduced over the years as parcels have been eliminated from the permit, and there are currently 4,000.03 adjudicated acres. In addition to these adjudicated rights, there are roughly 11,500 acres with water rights that are unadjudicated with unknown status. These unadjudicated lands are subject to elimination, meaning that they would be unable to have their rights confirmed and finalized as the lands are not irrigable. The major irrigated crops in the area include grass hay and alfalfa.

Many irrigators on the Canal also have contracts to obtain water from Meeks Cabin Reservoir. The reservoir is located approximately 22 miles southwest of Fort Bridger and 2 miles north of the Wyoming-Utah state line. The reservoir covers 473 acres, and has a total capacity of 32,470 acre-feet (af). The dam was constructed from 1966 to 1971, and impounds water from the Blacks Fork River.

Individual irrigators contracted with the Bridger Valley Water Conservancy District (BVWCD) to obtain stored water from Meeks Cabin Reservoir. Water stored and supplied by Meeks Cabin Reservoir is critical to agricultural operations for the Canal irrigators. The stored water is used when flows on the Blacks Fork River drop below demands, which represents a large portion of the growing season. Without this water, many acres of land would not be irrigated for a majority of the summer or fall.

Seepage on the Canal is apparent in many areas due to the vegetation growing adjacent to and down gradient of the Canal. Areas where the Canal circumvents draws generally have observable growth due to seepage, likely due to water from both directions. Locations of standing water were also observed. Water losses have been estimated at up to 30 percent per mile. This includes water lost through evapotranspiration, evaporation, and deep percolation.

The condition of head gates on the Canal varies from good to non-functional. Portions of the Canal have significant erosion issues, both on the main stem and on laterals. The majority of the eroded areas are located on the lower portion of the Canal below the split. Some head gates have had the majority of the bank behind the concrete deteriorate due to use by cattle, even to the point that water surrounds the head gate. Other head gates are located higher than the ditch bottom due to changes in the Canal.

Reclamation uses studies that are completed in-house or by other entities such as NRCS or USGS, to calculate the salt load reduction estimates for a given portion of Canal. The Austin Canal project is located within the West Blacks Fork project area, for which studies have been previously completed. From this data,

Reclamation calculated the estimated salt load reduction for the proposed improvements (Bureau of Reclamation letter, 2012). Based on this, the Canal Replacement would save approximately 1,092 tons a year of salt from the system, along with increasing water use efficiency by reducing seepage loss through the canal.

1.5. Scoping

Three studies were conducted on behalf of the WWDO regarding the Austin and Wall Canals. The canals have issues with loss due to seepage, and studies looked at various aspects of the canals and potential solutions. The Level I report was completed for WWDO in 2009, and addressed the entire length of both canals. A public meeting was held on September 2, 2009, to present the findings of the report.

The Level II report was completed for WWDO in 2011, which addressed the Austin and Wall Canals, as well as the Wall Reservoir. A public meeting was held on February 14, 2011, to present the study findings. Results of data collection activities and potential designs for repair options were presented.

The Level II Phase II report was completed in 2012. A public hearing was held in Lyman on December 4, 2012, under the direction of the Wyoming Water Development Committee (WWDC), and input was received from the public regarding the proposed project. Comments were then delivered to WWDC to support the decision regarding funding. While there were concerns expressed at the hearing, there was no one opposed to the project.

1.6 Permits, Licenses, Agreements, and Authorizations

Implementation of the Proposed Action may require a number of authorizations or permits from state and Federal agencies. The District would be responsible for obtaining all permits, licenses, and authorizations required for the Project. Potential authorizations or permits may include those listed in Table 1-2 and others not listed.

Table 1.2
Permits and Authorizations

Agency/Department	Permit or Authorization
Environmental Protection Agency (EPA)	Stormwater Pollution Prevention Plan for Construction Activities.
United States Army Corps of Engineers (USACE)	A USACE Permit in compliance with Section 404 of the Clean Water Act, may be required if waters of the United States are proposed to be filled or dredged as part of the Project.
Bureau of Land Management (BLM)	A crossing agreement to replace portions of the Canal on BLM land.
Wyoming State Historic Preservation Office	Consultation pursuant to Section 106 of the National Historic Preservation Act.
Uintah County	Permit for closure of Uinta County Road 231 during project construction.

1.7 Relationship to Laws, Regulations, Plans or other Environmental Analyses

1.7.1 Laws and Regulations

The following list includes the laws and regulations that were of particular relevance in creating this document:

Natural Resource Protection Laws

- National Environment Policy Act of 1969 (NEPA), (42 U.S.C. §§ 4321-4370c.)
- Federal Land Policy and Management Act of 1976 (FLPMA), (Pub.L. 94-579)
- Omnibus Public Land Management Act of 2009, (Pub.L. 111–11, H.R. 146)
- Endangered Species Act of 1973 (ESA), as amended, (16 U.S.C. 1531-1544, 87 Stat. 884)
- Clean Water Act of 1972 (CWA), as amended, (33 U.S.C. 1251 et seq.)
- Migratory Bird Treaty Act of 1918 (MBTA), (16 U.S.C. 703-712)
- Bald and Golden Eagle Protection Act of 1940 (Eagle Act), (16 U.S.C. 668-668c)

Cultural Resource Laws

- National Historic Preservation Act of 1966 (NHPA), (16 U.S.C. 470 et seq.)
- Archaeological Resources Protection Act of 1979 (ARPA), (16 U.S.C. 470aa-470mm et seq.)

Native American Laws

- American Indian Religious Freedom Act of 1978 (AIRFA), (42 U.S.C. 1996 and 1996a)
- Native American Graves Protection and Repatriation Act of 1990 (NAGPRA), (25U.S.C. 3001 et seq.)

Paleontological Resource Laws

- Paleontological Resources Preservation Act of 2009 (PRPA), (Section 6301-6312 of the Omnibus Land Management Act of 2009 [Public Law 111-11 123 Stat. 991-1456])

1.7.2 Relationship to Plans or Other Environmental Analyses

The Proposed Action is subject to the Kemmerer Resource Management Plan/ Final Environmental Impact Statement/Record of Decision (RMP/FEIS/ROD), as approved on May 24, 2010. The plan has been reviewed to determine if the Proposed Action conforms with the Land Use Plan's terms and conditions, as required by 43 CFR §1610.5-3. This action is in full conformance with the land use direction pertaining to Land Resources (LR) goals, objectives, and decisions/management actions; LR:2.1.

The following reports and studies were completed on behalf of the Wyoming Water Development Office for the Austin and Wall Canals, to determine the best solution for reducing seepage along the Canals and salt loading to the Colorado River.

- Austin and Wall Canals Level I Study, November 2009
- Austin and Wall Canals and Reservoir Level II Study, September 2011
- Austin and Wall Canals Level II Phase II Study, August 2013

Chapter 2 Proposed Action and Alternatives

2.1 Introduction

This chapter describes the features of the No Action Alternative and Proposed Action, and presents a comparative analysis. It includes a description of each alternative considered. Other alternatives were also considered, but were eliminated from further analysis. A description of these alternatives, and reasoning for their elimination from further analysis, are provided in Section 2.5.

2.2 No Action Alternative

Under the No Action Alternative, the existing facilities would continue to be operated under current conditions. Irrigation water would continue to be lost due to seepage, and would not be available for irrigation. This seepage would continue to load approximately 1,092 tons of salt annually into the Colorado River Basin through the Black Fork River system. Also, the loss of irrigation water due to seepage requires diversion of additional water in order to reach the desired locations of agricultural use due to the inefficiency of the existing unlined Canal system.

2.3 Proposed Action

The Proposed Action (Preferred Alternative) would replace approximately 6 miles (roughly one-third of the entire Canal length) of open canal with a buried HDPE pipeline. The pipe for the pipeline would range in size from 20 to 48 inch diameter. It is estimated that approximately 3.2 miles (17,000 feet) of pipeline would require imported bedding. The remainder of the pipeline would be bedded using native material excavated along the pipeline route.

There would be a split of the pipeline similar to the existing split in the Canal to serve all required lands. There would be approximately 10 takeouts along the pipelines. The takeouts would vary in size from 12 to 24 inches depending upon the water right at the takeout. Takeout size and location would be verified during the project design process. Additional livestock takeouts would also be installed as needed. The project would install new turnout structures with needed valves and flow measurement capabilities. Drains would be installed as needed to facilitate draining of the pipeline each winter.

The proposed piping would generally stay within the existing lateral corridor, although some areas would likely be straightened in order to reduce bends and unnecessary pipe. The pipe sizes would begin with a 48-inch diameter, and reduce down to 20-inch diameter pipes near the downstream ends of the project. Pipe diameters would be subject to adjustment during the design process. The project would include abandonment and reclamation of the replaced portions of the existing canal.

Construction disturbance would be confined to the immediate area along the existing Canal and the proposed alignment, which would have a 100-foot-wide construction easement, which would also include the staging areas for the Proposed Action. New easements would be obtained from landowners as needed to accommodate deviation from the current alignment. In these locations, a 50-foot-wide permanent easement would be obtained. Access would be along existing roads, which are along the existing Canal and proposed pipeline route.

Reclamation calculated the salt load reduction for the proposed improvements. These estimates are shown in Table 2.3 below:

Table 2.3
Estimated Salt Load Reduction

	Austin Canal – City Road 231 to Split	Austin Canal – North Leg Below Split	Austin Canal – South Leg Below Split
Estimated Salt Load Reduction (tons/year)	184	280	628

2.3.1 Construction

Construction of the pipeline would occur as follows:

- Staking of the construction zone
- Mobilization
- Delivery of pipe and other materials to the project site and staging areas
- Excavation of the trench, placement of pipe, backfill
- Clean up and reclaim project area

Trenches for pipe installation would be approximately 6-feet-wide to accommodate installation of large pipe. Trench depth can vary depending upon the location on the alignment. Most of the installation would be within the existing Canal bed, although some areas would utilize a straighter alignment. Excavated material would be placed to the side of the trench and used for backfill. Roughly half of the pipeline would require the installation of imported bedding due to rocky material. In areas with good topsoil, the topsoil would be placed separately from the excavated material in order to allow replacement on top of the

trench. In areas with a new alignment, the existing Canal would be filled in and reclaimed as required by Reclamation.

Pipe and other materials would generally be delivered to the project site using tractor trailers, and off loaded at the staging areas or along the project. From the staging areas, materials would be transported by various types of equipment depending upon the size and availability.

A conventional construction process of approximately 11 month duration is anticipated for the proposed project. A general contractor would complete the work. The construction schedule would be implemented to minimize impact during the irrigation season, with most of the pipeline installation work being completed in the fall, winter, and spring. Seeding of disturbed areas would be required following construction; however, there are locations within the project area that have little vegetation in the natural state.

2.3.2 Land Disturbance

As previously stated, the proposed pipeline would be approximately 6 miles in length and would require a construction corridor of 100 feet. Existing roads in the area would be used for access to the site in order to minimize disturbance. These roads are currently used for access to the Canal for maintenance, for ranching activities, as well as for access to neighboring properties.

Specifics regarding restoration of the project area would be included in the drawings and specifications for the project. This will include restoration procedures, seeding requirements, and noxious weed control.

A Habitat Replacement Plan would be developed congruently with this project to address any wildlife habitat loss caused by construction of this project.

2.4 Eliminated Alternatives

As outlined in previous studies conducted for the WWDO (Sunrise Engineering, Inc. 2009; 2011; 2013), alternative options for the Canal consisted of various types of liners to inhibit or eliminate seepage. Temporary spray-in soil sealants such as polyacrylamide were investigated; however, they require frequent reapplication. Various liners including geomembrane, geocomposite, compacted earth, geosynthetic clay, corrugated HDPE, concrete, and shotcrete were evaluated.

Many of these alternatives were eliminated because the selected alternative was required to have a 50 year design life that met Reclamation standards to be eligible for funding under the CRBSCP. With the exception of covered geomembrane liners and concrete liners, none of the liners investigated met this standard. The covered geomembrane liners and concrete liners could meet this

50 year standard, however, the cost to do so was higher than the pipe alternative. This was due to the requirements such as liner drainage systems and thicknesses of the required layers to meet standards.

Chapter 3 Affected Environment

3.1 Introduction

This chapter presents a review of the environmental resources that could be impacted by the Proposed Action. The present condition or characteristics of the following resource issues are discussed below: air quality, water resources, upland vegetation, wetland and riparian vegetation, fish and wildlife, special status species, cultural resources, paleontological resources, soils, socioeconomics, and cumulative impacts.

3.2 Resources Eliminated for Analysis

The resources in Table 3.2 do not occur within the project area or would not be impacted by either the No Action Alternative or Proposed Action:

Table 3.2
Resources Eliminated from Further Analysis

Resource	Reason for Elimination
Public Health	There would be no impact to public health from the Action Alternative.
Recreation Resources	There would be no direct effects on recreation resources from the Action Alternative.
Wilderness and Wild and Scenic Rivers	There are no designated wilderness or wild and scenic rivers within or near the project area.
Noise	There would be no long-term impacts due to noise from the Action Alternative. Any noise impact would be short-term during construction.
Prime and Unique Farmland	There is no designated prime or unique farmland within or near the project area.
Energy Requirements and Conservation Potential	There would be no impact to energy requirements and conservation potential from the Action Alternative.
Urban Quality and Design of the Built Environment	The proposed project is located in a rural area on public and agricultural lands.
Visual	There would be no impact to visual resources from the Action Alternative.
Indian Trust Assets	There would be no impact to Indian Trust Assets from the Action Alternative.

3.3 Air Quality

Air quality is regulated by the EPA and Wyoming Department of Environmental Quality (WDEQ) Air Quality Division. According to WDEQ Air Quality Division, there are no air quality monitoring sites located in or near the Bridger Valley area.

3.4 Water Resources

The project area is within the Blacks Fork River Basin, which is a tributary to the Green River and further downstream the Colorado River. The Canal diverts water from the Blacks Fork River during the irrigation season. Diversions are also made during the off-season period to provide stock watering needs and to maintain saturated conditions within the conveyance system.

Meeks Cabin Reservoir is located approximately 22 miles southwest of Fort Bridger, Wyoming, and has a permitted capacity of 32,470 af. The reservoir holds an original permit for irrigation use of 16,301.5 af with a March 26, 1935, priority (P6276R). The enlargement permit for irrigation and stock use of 17,269.5 af holds an April 6, 1939, permit. Most of the irrigators of the District have petitioner contracts with the BVWCD to obtain stored water from Meeks Cabin Reservoir.

During most irrigation seasons the natural flows in the Blacks Fork River are inadequate to serve all irrigation demands. When demands exceed the natural flows, the stored water releases from Meeks Cabin Reservoir allow District members to irrigate during the summer and fall months.

According to the Wyoming Water Quality Division Final Determination Regarding the Categorical Classification of Artificially Constructed Canals and Ditches (WDEQ 2005), facilities that fit within this designation that are not specifically otherwise designated are classified as a Class 4A water. This class consists of artificial canals and ditches that are not known to support fish populations, which would include the Austin Canal. This designation indicates that the facility is not constructed in natural drainages and is specifically managed for agricultural purposes. They are dewatered for significant periods of the year, and lack the flow and aquatic habitat needed to support an aquatic life use.

While much of the water delivered by the Canal is used for flood irrigation, the most significant loss in the system is due to seepage. As seepage water migrates through the soil, it can dissolve and accumulate salts. The salt load is carried into the river system through seeps and springs, which degrades the water quality of the river. The salt load accumulates as the water travels downstream. Seepage losses along the existing Canal are significant, and have been estimated to be up to 30 percent per mile (Sunrise Engineering, Inc., 2011 and 2013).

3.5 Vegetation

3.5.1 Upland Vegetation

A pre-field desktop analysis focused on land cover types as assigned by the Northwest Gap Analysis Project (NWGAP), big game habitat, greater sage-grouse habitat, and potential for sensitive-status species to occur in Uinta County in the land cover types intersecting the project centerline. Information was gathered based on aerial photography and historical species locations reported by the Wyoming Natural Diversity Database. The NWGAP land cover types were grouped into three wildlife habitat types based on dominant vegetation and structure: desert shrub, wetland, and developed/agricultural. The potential for special-status wildlife species to occur along the project centerline is based on the habitat types present.

Also, an on-site survey of the project area documented the habitat types present. Vegetation communities in each habitat type were evaluated for their ability to meet the habitat requirements of special-status species that have the potential to occur on and near the project centerline.

The NWGAP data identified a mosaic of 11 land cover types that intersect the project centerline (SWCA 2014, see Appendix A). By ground-truthing, the project land cover types during the site visit, it was determined that two land cover types identified by NWGAP are not represented along the project centerline: (1) Rocky Mountain Foothill Limber Pine-Juniper Woodland and (2) Western Great Plains Riparian Woodland and Shrubland. The linear feet from these two land cover types were reassigned to other NWGAP land cover types that were observed along the project centerline. The final assessments are reflected in Table 3.5.

Table 3.5
NWGAP Land Cover Types Categorized into Wildlife Habitat Types

Habitat Type	NWGAP Land Cover Type	Length of Intersection with Canal (LF)
Desert Shrub	Inter-Mountain Basins Big Sagebrush Shrubland	18,184.3
	Inter-Mountain Basins Greasewood Flat	4,452.9
	Inter-Mountain Basins Mixed Salt Desert Scrub	1,892.7
	Inter-Mountain Basins Mat Saltbush Shrubland	814.7
	Inter-Mountain Basins Active and Stabilized Dune	144.7
Total Desert Shrub		**25,489.3**
Wetland	Western Great Plains Saline Depression Wetland	1,103.3
	Introduced Riparian and Wetland Vegetation	75.8
Total Wetland		**1,179.1**
Developed/Agricultural	Pasture/Hay	1,592.1
	Developed, Open Space	101.6
Total Developed/Agricultural		**1,693.7**

3.5.2 Wetland and Riparian Vegetation

A desktop assessment of wetland vegetation was made as shown in Section 3.5.1 above. Previous field surveys resulted in a finding of no jurisdictional wetlands along the Canal, and an irrigational exemption was granted by the U.S. Army Corps of Engineers (Eco Bear Lake 2010, see Appendix B). A habitat score was created by Reclamation, resulting in a total of 0.54 acres of existing riparian vegetation (Bureau of Reclamation, 2014).

3.6 Fish and Wildlife Resources

An assessment was made regarding common wildlife species along the project area based on the above mentioned habitat types (SWCA 2014, see Appendix A). The results of this assessment are shown in Table 3.6.

Table 3.6
Common Wildlife Species with Potential to Occur in the Wildlife Habitat Types along the Project Centerline

Habitat Type	Species
Desert Shrub	Western meadowlark* (*Sturnella neglecta*), horned lark* (*Eremophila alpestris*), American kestrel (*Falco sparverius*), common raven* (*Corvus corax*), house finch (*Haemorhous mexicanus*), loggerhead shrike (*Lanius ludovicianus*), northern mockingbird (*Mimus polyglottos*), Say's phoebe (*Sayornis saya*), ground squirrel* (*Spermophilus sp.*), deer mouse (*Peromyscus sp.*), pronghorn* (*Antilocapra americana*), American badger (*Taxidea taxus*)
Wetland	Common yellowthroat (*Geothlypis trichas*), long-billed curlew (*Numenius americanus*), northern harrier* (*Circus cyaneus*), red-winged blackbird (*Agelaius phoeniceus*), yellow-headed blackbird (*Xanthocephalus xanthocephalus*)
Developed/Agricultural	American robin* (*Turdus migratorius*), black-billed magpie* (*Pica pica*), European starling (*Sturnus vulgaris*), lesser goldfinch (*Spinus psaltria*), mountain bluebird* (*Sialia currucoides*), mourning dove (*Zenaida macroura*), northern flicker* (*Colaptes auratus*), red-tailed Hawk* (*Buteo jamaicensis*), Swainson's hawk (*Buteo swainsoni*), white-tailed prairie dog (*Cynomys leucurus*)

*****Species was observed during field visit

The project centerline is located entirely in winter/yearlong pronghorn (*Antilocapra americana*) habitat. Pronghorn habitat consists of open, low-rolling, or flat terrain containing a variety of shrubs, grasses, and forbs. Mule deer (*Odocoileus hemionus*) winter/yearlong habitat occurs 0.25 mile south of the project centerline.

3.7 Special Status Species

The Endangered Species Act of 1973, protects plant and animal species that are listed as endangered or threatened, as well as their habitat. According to a species list (Table 3.7) obtained from the Wyoming Field Office of the U.S. Fish and Wildlife Service (Service), four endangered species, two threatened species, and one candidate species may have habitat in the project area and are described below.

Table 3.7
Federally Listed Species with Potential Habitat in the Project Area

Species/Critical Habitat	Scientific Name	Status	Habitat
Colorado River Fish • Bonytail • Colorado Pikeminnow • Humpback Chub • Razorback Sucker	*Gila elegans* *Ptychocheilus licius* *Gila cypha* *Xyrauchen texanus*	Endangered Endangered Endangered Endangered	Riverine habitat downstream of Wyoming in the Yampa, Green, and Colorado River systems
Ute Ladies'-tresses	*Spiranthes diluvialis*	Threatened	Seasonally moist soils and wet meadows of drainages below 7,000 feet elevation
Yellow-billed Cuckoo (Western)	*Coccyzus americanus*	Threatened	Riparian areas west of the Continental Divide
Greater Sage Grouse	*Centrocercus urophasianus*	Candidate	Sagebrush communities

3.7.1 Endangered Species

Colorado River Fish: Bonytail, Colorado Pikeminnow, Humpback Chub, Razorback Sucker

For general information on the life history and habitat requirements, as well as the designated critical habitat of the four endangered Green River fish, the information published by the Service in the following Federal Register volumes is incorporated by reference: 72 FR 19549, 67 FR 55270; 66 FR 58748; 59 FR 13374, and 58 FR 6578. The Federal Register Notice 59 FR 13374 13400 identified three Primary Constituent Elements (PCE) for the four Colorado River endangered fish: (1) High quality water (i.e., temperature, dissolved oxygen, lack of contaminants, nutrients, turbidity, etc.), (2) Physical habitat for use in spawning, nursery, feeding, and rearing, or corridors between these areas, including the river channel, bottom lands, oxbows, backwaters, and other areas in the 100 year flood plain; and (3) Biological environment including food supply, predation, and competition.

Threats to the fish include: streamflow regulation, habitat modification, competition with and predation by nonnative fish, pesticides and pollutants, and hybridization for the chub species.

3.7.2 Threatened Species

Ute Ladies'-tresses

Ute Ladies'-tresses is a perennial orchid, 8 to 20 inches tall, with white or ivory flowers clustered into a spike arrangement at the top of the stem. They typically bloom from late July through August. They are endemic to moist soils near wetland meadows, springs, lakes, and perennial streams. The elevation range of known occurrences is 4,200 to 7,000 feet, although no known populations in

Wyoming occur above 5,500 feet. Soils where Ute ladies'-tresses have been found typically range from fine silt/sand, to gravels and cobbles, as well as to highly organic and peaty soil types. Ute Ladies'-tresses are not found in heavy or tight clay soils or in extremely saline or alkaline soils.

Yellow-billed Cuckoo (Western Distinct Population Segment)
The yellow-billed cuckoo is dependent on large areas of woody, riparian vegetation that combine a dense shrubby understory for nesting and a cottonwood overstory for foraging. Surveys to determine the presence of the bird are difficult due to the secretive nature of the species and the variability in the timing of nesting.

3.7.3 Candidate Species

Greater Sage-Grouse
Greater sage-grouse are dependent on sagebrush habitats year-round. Habitat loss and degradation, as well as population connectivity, have been identified as important factors contributing to the decline of populations. A more detailed list of habitat requirements can be found in the sage-grouse management guidelines (Connelly et al. 2000). The northern portion of the proposed canal alignment runs approximately 1.9 miles from the East Airport lek. This lek is considered active by the Wyoming Game and Fish Department.

The list of endangered, threatened, and candidate species as outlined by the Service is shown in Table 3.7.

3.7.4 Species of Concern

Mountain plover (Charadrius montanus)
The mountain plover is a migratory, terrestrial shorebird averaging 8 inches in body length. They are light brown above and white below, but lack the contrasting band characteristic of other plovers. Mountain plovers arrive at their breeding grounds in the western Great Plains and Rocky Mountain states in the spring. Southbound migration is prolonged, starting in late June and continuing through October.

Sagebrush obligate birds
Sage thrasher (*Oreoscoptes montanus*), Brewer's sparrow (*Spizella breweri*), sage sparrow (*Amphispiza belli*) and loggerhead shrike (*Lanius ludovicianus*) are considered sage-obligate species, meaning they require sagebrush ecosystems for reproduction and survival. Loggerhead shrikes are shrub-nesting sagebrush obligates meaning they require sagebrush for successful reproduction but not necessarily for food or other resources. Slight variation in habitat preference exists among these species. Even with slight variability, all of these species inhabit prairie and foothill shrublands where sagebrush is present. This type of habitat occurs in or near the action area.

Pygmy rabbit

"The pygmy rabbit, (*Brachylagus idahoensis*), occurs in the western (primarily the northwestern) United States. The species can be found in northern and western Utah, where it prefers areas with tall dense sagebrush and loose soils. Pygmy rabbits are active throughout the year, and are most often above ground near dawn and dusk. Inactive periods are spent in underground burrows."

"Breeding occurs during the spring and early summer; females may produce a litter of approximately six young about thirty days after mating. Pygmy rabbits primarily eat sagebrush, but other vegetation is also consumed. As its name implies, the pygmy rabbit is the smallest of all rabbits in Wyoming, Utah, and in North America" (Utah Division of Wildlife Resources).

Idaho pocket gopher

There are several species of pocket gophers in Wyoming and the surrounding states. All look very similar, making it difficult to distinguish specimens to the species level. Reliable identification has to involve chromosomal analysis. Idaho pocket gophers (*Thomomys idahoensis*) along with other members of the pocket gopher family are highly adapted to fossorial (underground) living (Beauvais and Dark-Smiley 2005, Griscom et al. 2010) and occur from southwestern Montana, through eastern Idaho to southwestern Wyoming. Little is known about its habitat but its distribution suggests a preference for mountain foothill shrubland and a higher tolerance for rocky soils (Griscom et al. 2010).

In Wyoming, the species occupies shallow, stony soils and has been documented in open sagebrush, grassland plains, and subalpine mountain meadow habitats in Wyoming (Beauvais and Dark- Smiley 2005). The Biotics database maintained by the Wyoming Natural Diversity Database (WYNDD) contains only 33 known occurrences, all falling within the sagebrush foothills zone of the Wyoming Range, Uinta, and Wind River Mountains (Beauvais and Dark-Smiley 2005, Griscom et al. 2010). Very little is currently known about its biology and ecology (Griscom et al. 2010), but the species is assumed to be rare and has a limited distribution (Beauvais and Dark-Smiley 2005). Even though Idaho pocket gophers have not been observed, current habitat projections indicate that the species has the potential to occur throughout the project area.

Northern leopard frog

Northern leopard frogs require a broad range of habitats in close proximity due to their complicated life histories (Smith and Keinath 2004). Northern leopard frogs breed and lay eggs in stock ponds, semi-permanent ponds, in the margin of larger lakes, and beaver ponds (Smith and Keinath 2004). However, when streams are used for reproduction, eggs are deposited in backwaters out of the main flow of the stream (Smith and Keinath 2004). Following reproduction, adult northern leopard frogs move into upland habitat in which they may feed for the summer (Smith and Keinath 2004). In the fall, subadult and adult frogs migrate to

overwintering sites in order to hibernate under water in ponds (Smith and Keinath 2004).

Trelease's milkvetch

Trelease's milkvetch (*Astragalus racemous var. treleasei*) occurs mainly on outwash flats and fluted badlands slopes derived from shale at 6,500 to 7,500 feet (Heidel 2003). The most common species in its sparsely vegetated habitats include: thick spike wheatgrass, rubber rabbitbrush, green rabbitbrush, and shadescale (Heidel 2003). Most populations are found on pale whitish or somber grey silty loams derived from shales, with a vesicular structure (Heidel 2003).

3.7.5 Raptors

Raptors, or birds of prey, and the majority of other birds in the United States are protected by the Migratory Bird Treaty Act (MBTA), per the Service. Eagles are also protected by the Bald and Golden Eagle Protection Act (Eagle Act). Removal or destruction of active nests (i.e., nests that contain eggs or young), or causing abandonment on an active nest, could constitute a violation of these statutes. If nesting migratory birds are present on or near a project area, project timing is an important consideration. The Eagle Act protections include provisions not included in the MBTA, such as the protection of unoccupied nests and a prohibition on disturbing eagles.

Wildlife habitat in the raptor nest study area is similar to that described for the project centerline (i.e., desert shrub, wetland, and developed/agricultural habitats). These wildlife habitat types provide little habitat for raptors because of a lack of structure for nesting. Few, scattered trees and power poles occur in the raptor nest study area. One grouping of three raptor nests was observed in the northeast portion of the raptor nest study area (near the Austin Reservoir), and a single nest was observed near the north leg of the centerline. All observed nests were inactive. All observed nests were located in trees; no nests were observed on power poles. All observed nests were in good condition and were of the size that could either be used by a hawk (i.e., red-tailed hawk or Swainson's hawk) or a common raven. These species will often interchange nests.

In addition to the general raptor nest survey, special attention was given to the ferruginous hawk nest study area to determine whether nesting habitat is present for this species. Nesting habitat generally consists of juniper woodlands. No nesting habitat was observed.

3.8 Cultural Resources

The Austin Repair and Refurbishment Project lies in a region, the Wyoming Basin, with a complex cultural history reaching back perhaps 12,000 years. Aside from the equivocal Black's Fork Lithic Landscape (48UI1582), the inventory of the project area is of a considerably more limited scope. Only three archaeological sites were encountered: The Austin Canal itself, the Black's Fork

Lithic Landscape (48UT1582), and a small lithic scatter lacking in diagnostic artifacts (Crockett 2010, 2014). None of the three is judged eligible for nomination to the National Register of Historic Places (NRHP).

The absence of prehistoric properties that can be assigned to one or another of the major prehistoric occupation periods denies the possibility of associating the two prehistoric sites to one of the recognized cultural period (cf. Frison 1991:20). Consequently, while we have further demonstration of the use of the project area by Native Americans, the evidence is too general to be fit in any definitive way into the prehistoric context for the area. Furthermore, the two prehistoric sites are judged not eligible for nomination to the National Register of Historic Places (NRHP) removing them from consideration of the effects of the project.

The Austin Canal is securely dated and with a clear cultural association with the Historic Period and occupation of the region by Euroamericans. The canal does not appear on the early survey's General Land Office's of the area. It was permitted for diversion from the Black's Fork River in 1909. Since that time the number of acres served by the canal has dwindled significantly. This declining importance to the community is one of the factors in its determination of ineligibility for inclusion in the NRHP. The canal's lack of historical significance, as with the prehistoric sites, removes if from consideration of the canal piping's effects.

3.9 Paleontological Resources

A paleontological existing data analysis was conducted by SWCA Environmental Consultants, as outlined in their report dated December 3, 2013 (SWCA 2013, see Appendix E). The project area is mapped as being entirely underlain by one bedrock geologic unit – informal subdivision A of the middle Eocene Bridger Formation – which is locally mantled by Quaternary surficial sedimentary deposits. Rock accumulation rates, isotropic ages of ash-fall tuffs, and fossils indicate that the 2,763-foot-thick Bridger Formation was deposited over an approximately 3.5 million year interval from approximately 49.09 to 45.57 million years ago.

The BLM has ranked the Bridger Formation a Potential Fossil Yield Classification System Class 5, meaning it has very high potential to yield fossils with scientific significance. Museum records yielded no recorded fossil localities within 3 miles of the project area. In general, surface-disturbing actions have the potential to result in adverse impacts to surface and subsurface paleontological resources in rock units and to overlying sediments known to contain such resources.

3.10 Soil Sedimentation and Erosion

The soils in the project area were mapped by the NRCS, with the latest version (Version 9) dated December 20, 2013. The primary soils in the project area are fine sandy loams. The composition of soils in the project area includes Kandaly-Teagulf-Pepal complex (45 percent), Teagulf-Conpeak complex (19 percent), Sandbranch-Kandaly, loamy substratum complex (14 percent), and Garsid-Haterton complex (12 percent). The project area also has some areas of loam and clay loam. Some areas may have relatively shallow bedrock. Erosion is common in the project area, with some extensive erosion occurring along the existing Canal.

3.11 Public Safety, Access, and Transportation

The project area would be accessed from Uinta County Road 231. A small portion of that road would be included in the project area, as the road would be crossed with the new pipeline and a new culvert to provide adequate drainage for the area. The road is unpaved and provides access to residences and ranches from the north.

3.12 Environmental Justice

Executive Order 12898, requires that environmental justice be reviewed to ensure that minority or low income populations or Indian Tribes are not disproportionately impacted by a proposed action. The project area does not occur on Indian reservation lands or within a low income area. Also, there are no disproportionately impacted minority populations in or near the project area.

3.13 Socioeconomics

The community closest to the project area is the town of Lyman. According to the 2010 census, the town of Lyman had a population of 2,115 people and a median resident age of 32.6. According to the Wyoming Department of Administration and Information, the population in 2014 has dropped to 2,077. According to the Wyoming Office of State Lands and Investments, the median household income for the town of Lyman was $70,703 in 2014. Lyman exhibits limited overall racial diversity, with 97 percent of residents classified as white in the 2010 census.

Chapter 4 Environmental Consequences

The environmental consequences section describes the impacts of the No Action Alternative and the Proposed Action. The No Action Alternative and Proposed Action are previously described in Sections 2.2 and 2.3.

4.1 Air Quality

No Action Alternative
Under the No Action Alternative, there would be no adverse impact to air quality.

Proposed Action
Under the Proposed Action, there would be no long-term impacts to air quality. Dust would be generated by construction activities which would have a short-term negative impact. This dust would be generated by excavation activities as well as travel of construction equipment on unpaved roads. The Best Management Practices (BMP) such as watering for dust abatement would be implemented depending upon season and temperature. Any air quality impacts would be temporary, and would end at project completion.

4.2 Water Resources

No Action Alternative
Under the No Action Alternative, water would continue to be lost to seepage from the Canal. This seepage loss has been estimated at up to 30 percent per mile. Seepage losses would continue to contribute to the salt loading in the Blacks Fork River basin and the Colorado River system. Based on Reclamation's calculations, the salt contribution from the project area to the Colorado River system would be 1,092 tons per year on a long-term basis.

Proposed Action
The Proposed Action would essentially eliminate seepage along the stated section of the Canal. This would allow additional water to be available at the desired points of use, which results in a more efficient system. The amount of water diverted from the Blacks Fork River would not change, nor would the permitted water rights.

The Proposed Action would also reduce the quantity of salt being introduced into the Blacks Fork and Colorado River systems. Based on Reclamation's

calculations, the reduction in the amount of salt would be 1,092 tons per year on a long-term basis.

4.3 Vegetation

No Action Alternative
Under the No Action Alternative, upland vegetation would be impacted by construction equipment on an occasional basis due to routine maintenance of the Canal. This impact would be short-term and generally minor. Vegetation in the project area would generally remain as it is.

Under the No Action Alternative, riparian habitat would remain in its current condition. The existing riparian vegetation is limited due to the sporadic availability of water in this portion of the Canal.

Proposed Action
The Proposed Action would subject the project area to impact by construction equipment on a short-term basis during active construction activities. Construction activities would occur during the months of September through July within a 100-foot-wide construction easement. Impact would be due to excavation activities, movement of construction equipment, and staging of materials.

Most of the proposed construction activities would take place in upland and agricultural areas. These areas have generally been impacted previously by routine maintenance of the Canal. All areas disturbed by construction activities would be reclaimed and reseeded. Establishment of vegetation in the reseeded areas would be subject to natural precipitation events. Appropriate seeding mixtures would be used, and treatment of noxious species would be conducted as required by the BLM.

The Proposed Action would replace the existing Canal with a pipe system, thereby eliminating the flowing surface water from this portion of the Canal. The water would still be utilized for irrigation purposes, and additional irrigation water should be available with the elimination of seepage losses, particularly at the lower portions of the Canal.

A Request for Irrigational Exemption was submitted to the USACE in August 2010, by Eco Bear Lake, LLC as part of the preliminary study for the Austin Canal project. The request was to determine if the Proposed Action fell under the "Exemption for Construction and Maintenance of Irrigation Ditches" under Section 404 of the Clean Water Act. A reply from USACE dated September 24, 2010, determined that the maintenance and improvement activities described are exempt under Section 404(f) of the Clean Water Act and Part 323.4(a)(3) of the USACE regulations, and thus a USACE permit is not required.

The Austin Canal Piping Salinity Project Habitat Scoring (Bureau of Reclamation, 2014) estimates a total riparian area of 0.54 acres would be eliminated by the piping project. It states that native plant species are present but there is low diversity. The predominant plants are willows, yarrow, carex, and juncus.

4.4 Fish and Wildlife Resources

No Action Alternative
Under the No Action Alternative, there would be no adverse impact to fish and wildlife resources.

Proposed Action
The Proposed Action would replace the existing canal with a pipe system, thereby eliminating the flowing surface water from this portion of the Canal. There would be accommodations made along the proposed pipeline to provide water to livestock, such as hydrants and water troughs. This water would also be available to wildlife. In addition, a Habitat Replacement Plan will be developed in conjunction with Reclamation to replace wildlife habitat lost due to the project.

4.5 Special Status Species

4.5.1 Endangered Species

No Action Alternative
Under the No Action Alternative, there would be no effect to endangered species.

Proposed Action
Per the Service, formal interagency consultation is required for projects that may lead to new depletions of water from any system that is a tributary to the Colorado River. Federal agency actions resulting in water depletions in the Colorado River system may affect the endangered species listed above. Depletions include evaporative losses and/or consumptive use of surface or ground water within the affected basin. In accordance with the Upper Colorado River Endangered Fish Recovery Program, the Service has adopted a de minimis policy, which states that water related activities in the basin that result in less than 0.1 af per year of depletions in flow have no effect on the Colorado River endangered fish species. Under the Proposed Action, there would be no new depletions; therefore, there would be No Effect to the 4 Endangered Colorado River fish species.

4.52 Threatened Species

No Action Alternative
Under the No Action Alternative, there would be no effect to Threatened species.

Proposed Action
Under the Proposed Action, there would be no effect to Ute Ladies'-tresses or yellow-billed cuckoo, because suitable habitat does not exist in the area. The soils around the project area are highly saline, as evidenced by the vegetation growing along the Canal. Therefore, the area would not support growth of the species. In addition, there is not critical or even suitable habitat for yellow-billed cuckoo. The multi-storied wooded riparian habitat, with sufficient patch size and understory characteristics does not exist in the area. The area is almost entirely devoid of trees and is made up mostly of greasewood. The farther you go from the highly saline habitats and the Canal; you can find additional shrubs like sagebrush and rabbitbrush. Based on the lack of suitable habitat for these two species, there would be **No Effect** to Threatened species.

4.5.3 Candidate Species

No Action Alternative
Under the No Action Alternative, there would be no additional effects to Candidate species.

Proposed Action
Greater Sage-Grouse are the only Candidate species that may occur in the project area. There is no delineated "core area" habitat within the project area. However, there is general sage-grouse habitat in and around the project area. This is a mixture of sagebrush, rangeland grasses, and very few forbs. The area is currently grazed by domestic livestock and would continue to be for the foreseeable future. Enclosing the Canal into a pipeline would reduce any available seepage to areas that may be receiving water. This could cause some small meadows to dry up and become more like the natural existing sagebrush habitat in the area, which is largely devoid of an herbaceous understory. It would also eliminate the linear water feature that grouse may use to obtain free water. Fortunately this would not cause much of an adverse effect because there are multiple different free water sources (ponds, reservoir, etc.) available.

There could be direct effects to sage-grouse if construction of the pipeline were to occur during the breeding, nesting, or brood rearing season. If grouse utilized the area for nesting, which is less likely due to the distance from known/active leks (i.e. East Airport lek), they could be disturbed by construction activities and abandon a nest. Additionally, increased construction activity could lead to disruption of normal daily brood rearing behavior. Because the habitat in the area isn't as productive, based on salinity and observations of the site, the direct effect to suitable habitat would be minimal. In addition, the habitat replacement plan being proposed would likely improve adjacent acres for sage-grouse use. In order to comply with the Kemmerer Field Office Resource Management Plan and The 9 Plan Greater Sage-Grouse RMP Amendment/EIS, a time limited restriction will be applied for the project area from March 15 to July 15 for the protection of nesting and brood-rearing Sage-grouse.

4.5.4 Species of Concern

No Action Alternative

Under the No Action Alternative there would be no impact to species of concern, and existing conditions would continue.

Proposed Action

Regarding the mountain plover, the Service encourages avoidance of suitable habitat during the plover nesting season (April 10 through July 10), prohibits ground disturbing activities in prairie dog towns, and prohibits permanent above ground structures that may provide perches for avian predators. The proposed construction would avoid the plover nesting season, and would not disturb prairie dog towns. Above ground structures that could provide perches for avian predators would not be constructed. Effects to mountain plovers and their habitat would be short in duration and minimal overall, if the species is present.

Impacts to the sagebrush obligate birds would be similar to those described for Greater sage-grouse. In addition, migratory or passerine birds would experience similar short-term effects both to their normal daily activities and within the small corridor of habitat that would be disturbed. In order to comply with the Migratory Bird Treaty Act of 1918, the Proposed Action must not harm, harass, kill, or otherwise disturb the breeding behavior of passerine birds. Therefore, no construction would occur during the breeding, nesting, and brood rearing seasons unless the Right-of-Way (ROW) was grubbed to mineral soil prior to the nesting season.

The pygmy rabbit requires large mature sagebrush with loose friable soils. This project would only disturb a very narrow tract of land ROW within potentially suitable habitat. Therefore, the project would be in compliance with the requirements of the Service to retain large tracts of suitable habitat and corridors to adjacent habitat. Impacts to daily activities would be temporary during construction, and pygmy rabbits have shown resilience to much larger and wider ROWs with a much greater footprint of disturbance (i.e. Ruby natural gas pipeline). Therefore, the Proposed Action would have little to no effect on the species or its habitat.

Impacts to Idaho pocket gophers would be similar to those for pygmy rabbits.

Northern leopard frog habitat could be impacted from loss of vegetative cover along the currently open Canal after it would be enclosed into a pipe. However, the Canal edges are constantly maintained where possible, minimizing the amount of vegetative cover for frogs. Therefore, there are few areas providing sufficient cover for the species. In addition, the water type is not ideal for the frog, due to the constant water movement and channelized nature of the Canal. Though habitat use in the area is unknown, it does not provide optimal habitat. Habitat adjacent to the Canal is likely more suitable, and any current use of the Canal would likely shift towards the use of multiple ponds and the Austin Reservoir,

found in the project area. Therefore, impacts to the Northern leopard frog would be minimal.

Though presence of Trelease's milkvetch is unknown in the project area, impacts would be minimal and would not likely differ from the current condition. As discussed above, the edges of the Canal are treated (mowed, burned, or treated with herbicide) annually to remove vegetation. By enclosing the Canal in the pipe and reclaiming the area, the area would slowly return back to normal or a more native state where this milkvetch could grow unmolested. The footprint of disturbance would be minimal and therefore there would be a negligible effect on Trelease's milkvetch.

4.5.5 Raptors

No Action Alternative
Under the No Action Alternative there would be no impact to raptors, and existing conditions would continue.

Proposed Action
Effects to raptors would be negligible due to the fact that there are very few trees or perches in the area. Use of the area is likely determined by other factors unrelated to whether the Proposed Action is implemented. Hunting opportunities and prey would still likely be found, but potentially more concentrated in areas of already develop ponds or water sources. There would be no effect to raptors. If a nesting raptor were located during construction, the appropriate buffer would be implemented and work discontinued in that area until nesting activities discontinued.

4.6 Cultural Resources

No Action Alternative
Under the No Action Alternative there would be no impact to cultural resources, and existing conditions would continue.

Proposed Action
The Class III cultural resource inventory conducted for the project area revealed no NRHP eligible properties are in the APE. This leads to Reclamations determination of no historic properties affected for the Action Alternative. Wyoming State Historic Preservation Office concurred with this determination in August 12, 2015.

4.7 Paleontological Resources

No Action Alternative
Under the No Action Alternative, there would be no impact to paleontology resources, and existing conditions would continue.

Proposed Action
The Proposed Action would generally include construction in previously disturbed Canal and in surficial soils. These actions would not impact paleontological resources. In the event that excavation is required in or through bedrock materials, the Proposed Action may cause an impact to paleontological resources if present in the disturbed area.

4.8 Soil Sedimentation and Erosion

No Action Alternative
Under the No Action Alternative, existing conditions would continue and soil erosion would continue at the current rate. This includes areas of significant erosion along the Canal in various locations.

Proposed Action
The Proposed Action would eliminate a section of the Canal, thus eliminating the current erosion locations along the Canal. Construction activities would increase the erosion on a short-term basis; however, no water would be present in the Canal during construction. This situation would continue until construction and reclamation activities were completed. These activities would also reclaim areas that have been subject to erosion in the past. Following establishment of post-construction seeding, erosion activities would decline in the long-term.

4.9 Public Safety, Access, and Transportation

No Action Alternative
Under the No Action Alternative, there would be no impact to public safety, access, or transportation resources.

Proposed Action
The Proposed Action would have a short-term impact to Uinta County Road 231. Construction equipment would utilize the road for access to the project area. Also, the unpaved road would be crossed by the proposed pipeline, requiring the roadway to be closed for a period of time. A permit would be required from Uinta County for this action. Adequate traffic control signage meeting standards from the Manual on Uniform Traffic Control Devices (MUTCD) would be required. There would be no long-term impact to the roadway.

4.10 Environmental Justice

No Action Alternative
Under the No Action Alternative, there would be no impact to low income, minority, or Indian Tribe populations.

Proposed Action
The Proposed Action would have no impact to low income, minority, or Indian Tribe populations as there are none in or near the project area.

4.11 Socioeconomics

No Action Alternative
Under the No Action Alternative, there would be no changes to the socioeconomics of the community.

Proposed Action
The Proposed Action would result in an increase in crop production to some members of the Austin/Wall Irrigation District. This would result in an economic benefit for those members. There would also be a temporary increase in jobs during construction of the project, including construction workers and suppliers of construction materials. It is assumed that the bulk of the construction materials (pipe) would be supplied from outside of the area, as there are no large pipe suppliers available locally. The project would not adversely affect low income or minority populations.

Piping of the canal may result in reduced maintenance costs. However, the canal does not receive significant annual maintenance work at this time. The maintenance effort required to flush and drain the pipeline may not be significantly different than the maintenance effort currently required.

4.12 Cumulative Impacts

Impacts to an area from a single given action may be small; however, the combination of multiple actions can result in a larger impact to a project area. The Proposed Action would have a relatively small disturbance both in area and in time.

No Action Alternative
Under the No Action Alternative, there would be no cumulative impacts.

Proposed Action
The Proposed Action is part of a basin-wide program, the CRBSCP. This program results in improved water quality by reducing salinity in the Colorado River Basin. Another ongoing action is the Upper Colorado River Endangered Fish Recovery Program (Recovery Program). The CRBSCP provides a benefit to the Recovery Program in the form of improved water quality. The Proposed Action would contribute to this benefit.

Chapter 5 Environmental Commitments

The following environmental commitments would be implemented as part of the Proposed Action for piping a section of the Canal.

1. **Additional Analysis.** If the Proposed Action were to change significantly from what is described in this document, additional environmental analyses will be undertaken as necessary.

2. **Cultural Resources.** Per Wyoming State Historic Preservation Office, if any cultural materials are discovered during construction, work in the area shall halt immediately, the lead Federal agency must be contacted, and the materials evaluated by an archaeologist or historian meeting the Secretary of the Interior's Professional Qualification Standards (48 FR 22716, Sept. 1983).

3. **Paleontological Resources.** Monitoring will be conducted during construction activities that impact a previously undisturbed bedrock layer. If any mineralized bones or other potentially significant fossils are discovered by project personnel during construction activities, fossils will be left in place untouched and Reclamation will be notified.

4. **Construction Activities Confined to Surveyed Corridor.** All construction activities will be confined to areas previously surveyed for cultural, paleontological, and biological resources.

5. **Roads.** Existing roads will be used whenever possible for project activities. Access will also be required along the proposed pipeline route during construction.

6. **Disturbed Areas.** Topsoil in areas to be excavated will be stripped, stockpiled, and replaced in order to provide a seed bed during Reclamation activities. Reclaimed areas will be shaped and contoured to blend with the surrounding area. Seeding activities will utilize weed-free seed mixes of native plants and agricultural grasses and will occur at appropriate times.

7. **Air Quality.** The BMP's will be utilized to control dust caused by construction activities.

8. **Habitat Replacement.** A plan to replace the wildlife habitat eliminated by this project will be created and approved by Reclamation, in coordination with the Service and the Wyoming Game and Fish Department. A proposed replacement property will be acquired and improvements to that property will equal or exceed the values of the habitat lost due to project implementation. The Habitat Replacement Plan will be approved and initiated prior to project completion and final payment of construction funds, in accordance with salinity control program procedures.

9. To comply with the Migratory Bird Treaty Act, vegetation (i.e., trees, shrubs, and herbaceous plants) will not be removed during the bird breeding season (March through August, depending on the species of concern and weather in a given year). If construction will occur during this time period, bird nest clearance surveys will be done by a qualified biologist to verify the absence of nests prior to vegetation removal. If nests are found, further coordination with the Service or Reclamation will be required. Construction activities occurring completely outside the nesting season do not necessitate surveys.

10. If construction occurs during the raptor nesting season (January 1 through September 30), the inactive nests described in this report will be checked for signs of nesting activity. If the nest is occupied, the nesting species will be determined by a qualified biologist, and the appropriate seasonal and spatial buffer, as identified by the Service's Wyoming Field Office, will be applied.

11. Although no infestations of noxious or invasive weeds were identified on the project centerline, ground disturbance will often result in the establishment of plant pests. The BMP's, such as weed treatment prior to construction and equipment cleaning, will be implemented as part of this project.

12. If land is not grubbed during seasons of inactivity of passerine birds, a qualified biologist would have to survey to the area to insure that construction would not affect passerine birds or raptors.

Chapter 6 Consultation and Coordination

Reclamation's public involvement process enables stakeholders and other interested parties the opportunity to review the Proposed Action and to participate through written comments. The following consultation and coordination was undertaken as part of this EA.

6.1 Bureau of Land Management

The Bureau of Land Management was a cooperator during the environmental assessment process. Portions of the project area are lands administered by the BLM, and the right-of-way process has been undertaken concurrent with the environmental assessment.

6.2 U.S. Fish and Wildlife Service

The Service was contacted regarding the potential for listed species in the project area. The Service has responded with recommendations regarding the ESA, as well as for the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act (see Appendix C).

6.3 Native American Consultation

No Native Trust lands are involved and the project's determination of No historic properties affected further supports the fact that no consultation with Native American Tribes has taken place.

6.4 Wyoming State Historic Preservation Office

The Wyoming State Historic Preservation Office has been consulted on this project and has concurred with Reclamation's determination of No historic properties affected.

Chapter 7 List of Preparers

Table 7.1 provides a list of agency representatives and consultants who participated in preparation of the Environmental Assessment.

Table 7.1
List of Preparers

Name	Title/Position	Contributions
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Beth Reinhart	Group Chief, Environmental Division, Bureau of Reclamation, Provo Area Office	Document Review
Travis Chewning	Planning and Environmental Coordinator, Kemmerer Field Office, Bureau of Land Management	Document Review
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Lynn Harrell	Archaeologist, Bureau of Land Management	Cultural Resources
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Bryce Nielsen	Eco Bear Lake, LLC	Wetland Resources
Various	SWCA Environmental Consultants	Biological Resources
Vicki L. Meyers, M.S. and Georgia E. Knauss, M.S.	SWCA Environmental Consultants	Paleontological Resources

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FIGURES

Austin Pipeline Project
T16N R115W, T16N R114W, T17N R114W
Within the Austin Reservoir Wyo Quad

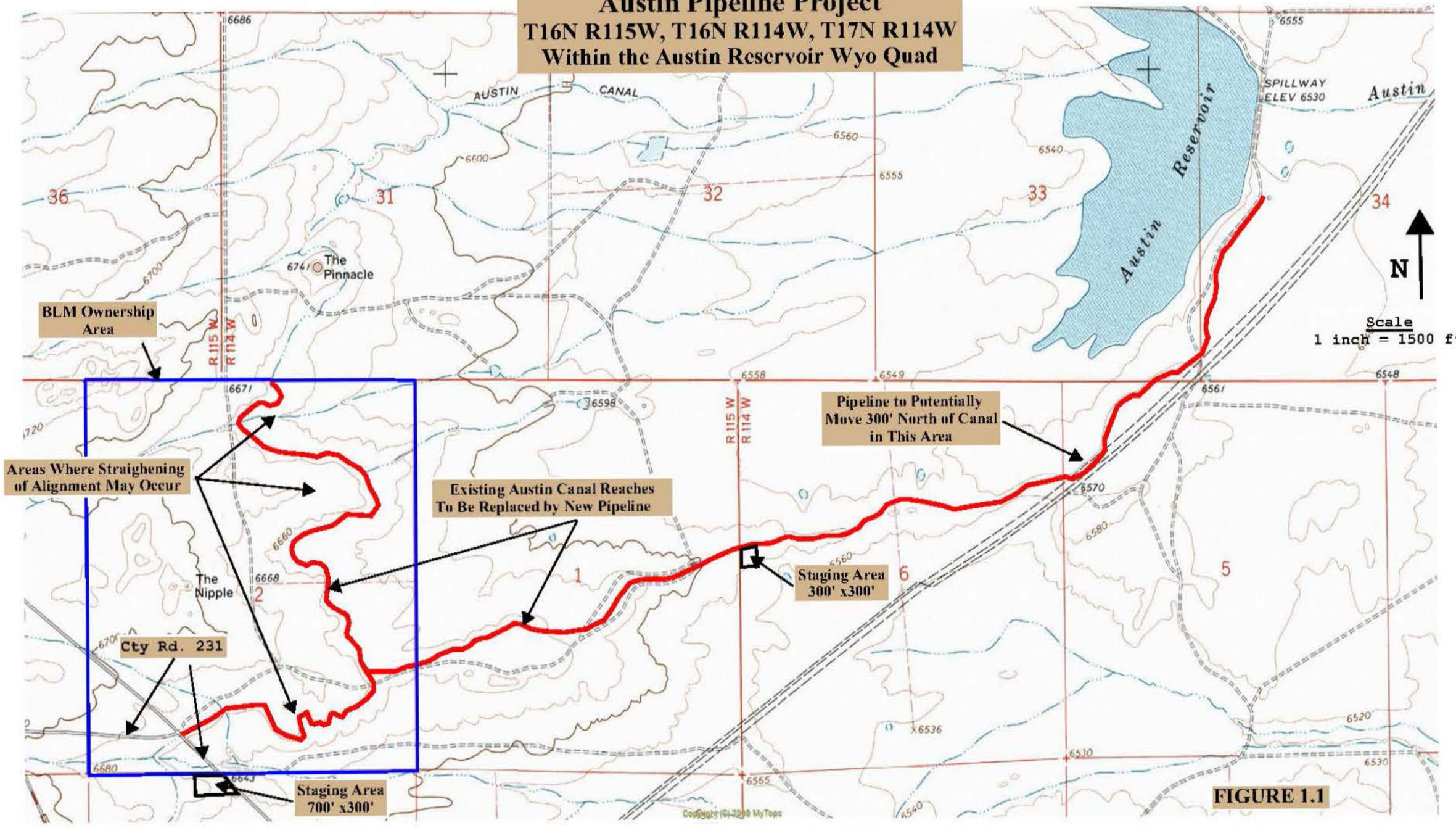

FIGURE 1.1

APPENDIX A

WILDLIFE HABITAT ASSESSMENT

SWCA®
ENVIRONMENTAL CONSULTANTS
Sound Science. Creative Solutions.®

Austin Canal Replacement Project Wildlife Habitat Assessment

Prepared for

Sunrise Engineering

Prepared by

SWCA Environmental Consultants

April 2014

AUSTIN CANAL REPLACEMENT PROJECT
WILDLIFE HABITAT ASSESSMENT

Prepared for

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April 24, 2014

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INTRODUCTION

Sunrise Engineering contracted SWCA Environmental Consultants (SWCA) to assess wildlife habitat and raptor nesting habitat for the Austin Canal Replacement Project. The project will consist of replacing approximately 6 miles of existing irrigation canal with pipe in Uinta County, Wyoming. The Bureau of Reclamation, Provo Area Office, is the lead federal agency for this project.

SWCA prepared a pre-field desktop wildlife habitat assessment for the project. This assessment comprises the following:

- Wildlife habitat and common species associations
- Raptor nesting habitat
- Federally listed threatened, endangered, and candidate species and Wyoming Game and Fish Department (WGFD) Species of Greatest Conservation Need (SGCN) (collectively referred to as *special-status species*)
- Big game species

Additionally, SWCA conducted a raptor survey for the project area and a 0.5-mile buffer around the project area (raptor nest study area) and a ferruginous hawk (*Buteo regalis*) survey for the project area and a 1-mile buffer around the project area (ferruginous hawk nest study area; Figure 1).

RELEVANT ENVIRONMENTAL LAWS AND REGULATIONS

The Council of Environmental Quality regulations, established that a "Major federal action includes actions with effects that may be major and which are potentially subject to federal control and responsibility...Actions include new and continuing activities, including projects and programs entirely or partly financed, assisted, conducted, regulated, or approved by federal agencies…." (40 Code of Federal Regulations [CFR] 1508.18 and 1808.18(a)). Since this project is located primarily on Bureau of Reclamation lands with a small portion on Bureau of Land Management lands, this project is being reviewed in the context of these environmental laws and regulations.

Threatened, Endangered, and Candidate Species

The Endangered Species Act (ESA) of 1973 provides a program for the conservation of threatened and endangered plants, animals, and habitats. It prohibits federal agencies from authorizing, funding, or carrying out actions that may "jeopardize the continued existence of" listed, endangered, or threatened species or cause "adverse modification" to designated critical habitat without a permit. Section 7 of the ESA, as amended, applies to federal agency actions and sets forth requirements for consultation between the lead federal agency and the U.S. Fish and Wildlife Service (USFWS) or National Marine Fisheries Service concerning potential project-related and cumulative impacts to federally listed species.

Wildlife and Fisheries

The Fish and Wildlife Coordination Act (originally enacted in 1934) requires consultation with the state wildlife agencies and with the USFWS concerning the conservation of wildlife where streams or other waters are proposed to be controlled or modified by a federal agency.

The Bald and Golden Eagle Protection Act (originally enacted in 1940) prohibits the possession, taking, or selling of bald and golden eagles, their parts, eggs, or nests in the United States.

The Migratory Bird Treaty Act (16 United States Code 703–712) makes it unlawful at any time, by any means, or in any manner, to pursue, hunt, take, capture, kill, or sell migratory birds, their parts, nests, or eggs in the United States.

Executive Order 13186 directs federal agencies whose activities are likely to have a measurable negative effect on migratory birds to undertake actions in support of the Migratory Bird Treaty Act.

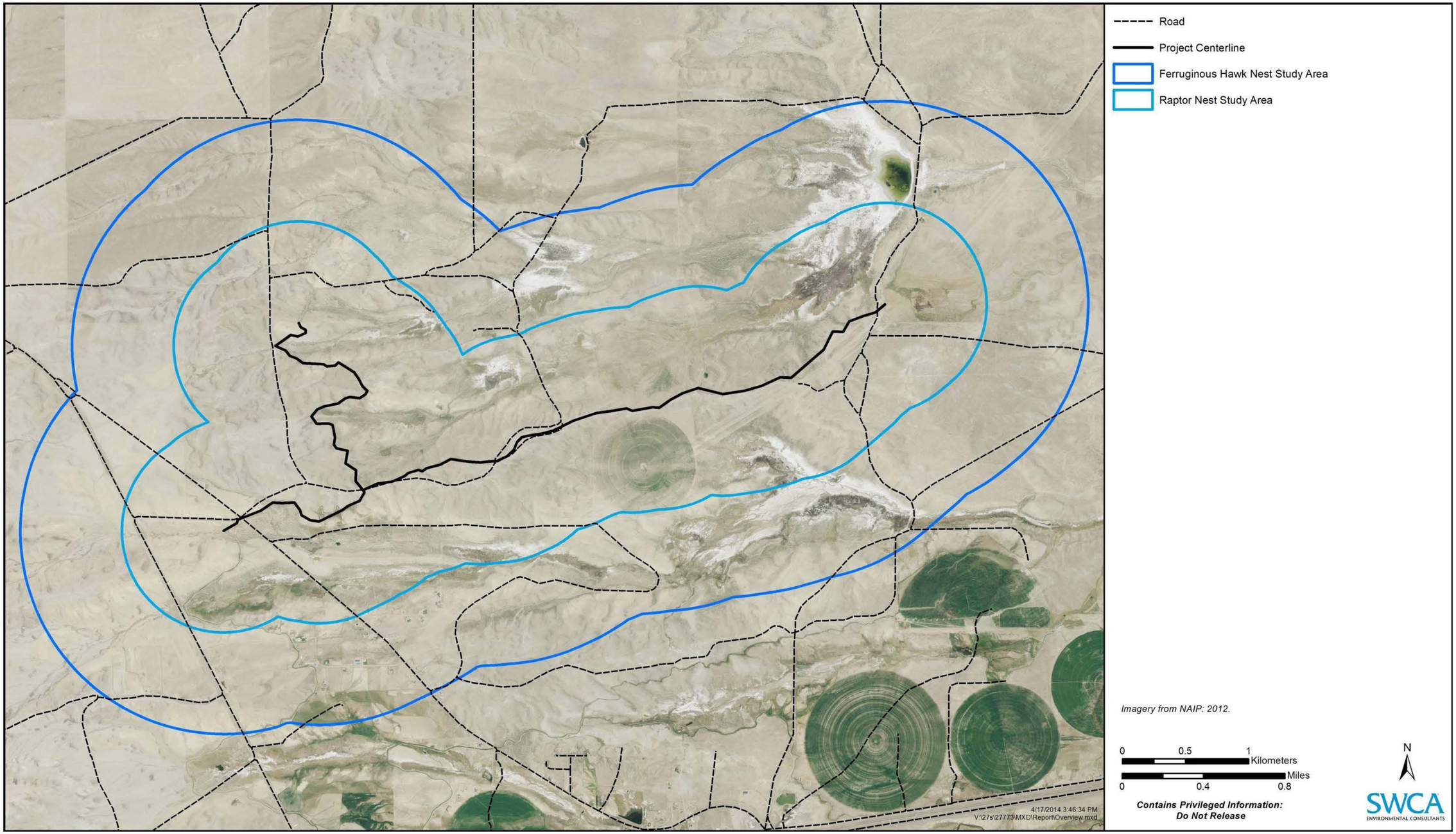

Figure 1. Project centerline, raptor nest study area, and ferruginous hawk nest study area.

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METHODS

A pre-field desktop analysis for the project centerline was completed on April, 04, 2014. It focused on land cover types as assigned by the Northwest Gap Analysis Project (NWGAP; Aycrigg et al. 2013), big game habitat, greater sage-grouse (*Centrocercus urophasianus*) habitat, and potential for sensitive-status species to occur in Uinta County in the land cover types intersecting the project centerline. Information was gathered based on aerial photography and historical species locations reported by the Wyoming Natural Diversity Database (WYNDD; Appendix A). Wyoming's *State Wildlife Action Plan* (WGFD 2010) was reviewed for Wyoming's list of species of greatest conservation need (SGCN), and the USFWS online list of threatened, endangered, and candidate species was reviewed (USFWS 2014). For a complete list of special-status wildlife species with potential to occur in Uinta County in the habitat types present along the project centerline, see Appendix B.

On Friday, April 4, 2014, SWCA biologists traveled the project centerline and study areas by car and foot, documented the habitat types present, and identified all observed wildlife individuals. Vegetation communities in each habitat type were evaluated for their ability to meet the habitat requirements of special-status species that have the potential to occur on and near the project centerline. The raptor nest survey was performed by traveling public and private roads by car within the raptor nest study area. Stops were made during the survey to view tall structures (trees, power poles, etc. [no cliffs were present in the survey area]) with binoculars to search for raptors and potential raptor nests. Roads in the ferruginous hawk nest study area were traveled by car with biologists searching for nesting habitat that would be suitable for the species (i.e., juniper woodland).

RESULTS

The following sections describe the wildlife habitat types along the project centerline, raptor nest study area, and ferruginous hawk nest study area and evaluate the potential for wildlife species of interest to occur there. SWCA reviewed NWGAP land cover data to identify land cover types along the project centerline and study areas. NWGAP land cover types were grouped into three wildlife habitat types based on dominant vegetation and structure: desert shrub, wetland, and developed/agricultural. The potential for special-status wildlife species to occur alone the project centerline is based on the habitat types present. Species specific habitat associations and potential for special-status species to occur are presented in Appendix B.

Wildlife Habitat and Associated Wildlife Species

The pre-field desktop analysis of NWGAP data identified a mosaic of 11 land cover types that intersect the project centerline (Figure 2). By groundtruthing the project land cover types during the site visit, it was determined that two land cover types identified by NWGAP are not represented along the project centerline: 1) Rocky Mountain Foothill Limber Pine-Juniper Woodland and 2) Western Great Plains Riparian Woodland and Shrubland. The linear feet from these two land cover types were reassigned to other NWGAP land cover types that were observed along the project centerline as follows: Rocky Mountain Foothill Limber Pine-Juniper Woodland (930.5 linear feet) was reassigned to Inter-Mountain Basins Big Sagebrush Shrubland, and Western Great Plains Riparian Woodland and Shrubland (883.1 linear feet) was reassigned to Western Great Plains Saline Depression Wetland. These reassignments are reflected in Table 1.

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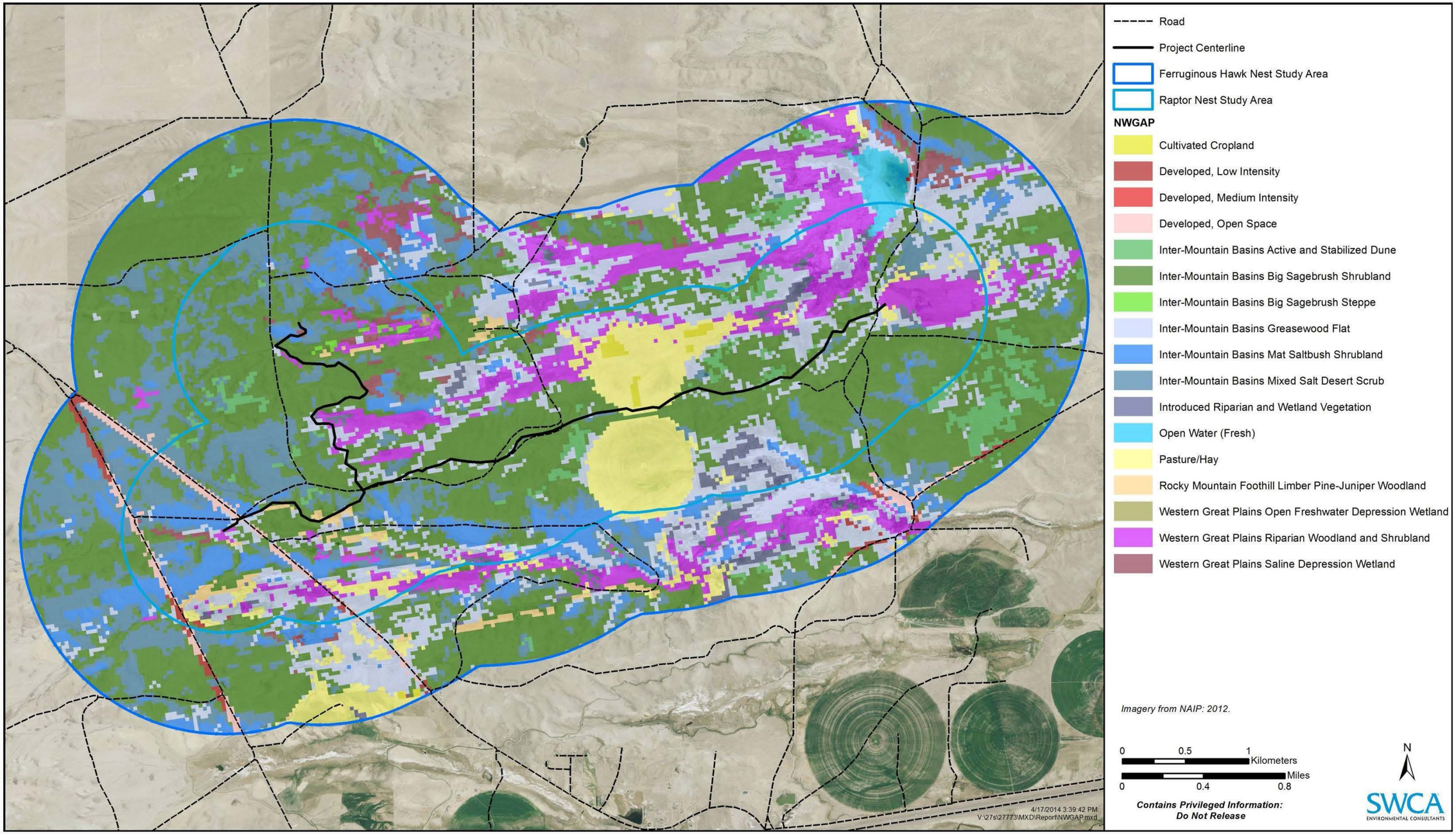

Figure 2. NWGAP land cover classes along the project centerline, raptor nest study area, and ferruginous hawk nest study area.

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NWGAP land cover types were categorized into wildlife habitat types based on the dominant vegetation and vegetative structure. This was done to simplify the analysis because wildlife often use certain land cover types in similar ways. Table 1 displays NWGAP land cover types categorized into three wildlife habitat types present on the centerline as well as the total linear feet for each habitat type. Table 2 displays common wildlife species with potential to occur in the wildlife habitat types of the project centerline.

Table 1. NWGAP Land Cover Types Categorized into Wildlife Habitat Types

Habitat Type	NWGAP Land Cover Type	Length of Intersection with Canal (linear feet)
Desert shrub	Inter-Mountain Basins Big Sagebrush Shrubland	18,184.3
	Inter-Mountain Basins Greasewood Flat	4,452.9
	Inter-Mountain Basins Mixed Salt Desert Scrub	1,892.7
	Inter-Mountain Basins Mat Saltbush Shrubland	814.7
	Inter-Mountain Basins Active and Stabilized Dune	144.7
Total desert shrub		**25,489.3**
Wetland	Western Great Plains Saline Depression Wetland	1,103.3
	Introduced Riparian and Wetland Vegetation	75.8
Total wetland		**1,179.1**
Developed/agricultural	Pasture/Hay	1,592.1
	Developed, Open Space	101.6
Total developed/agricultural		**1,693.7**

Table 2. Common Wildlife Species with Potential to Occur in the Wildlife Habitat Types along the Project Centerline

Habitat Type	Species[†]
Desert shrub	Western meadowlark* (*Sturnella neglecta*), horned lark* (*Eremophila alpestris*), American kestrel (*Falco sparverius*), common raven* (*Corvus corax*), house finch (*Haemorhous mexicanus*), loggerhead shrike (*Lanius ludovicianus*), northern mockingbird (*Mimus polyglottos*), Say's phoebe (*Sayornis saya*), ground squirrel* (*Spermophilus* sp.), deer mouse (*Peromyscus* sp.), pronghorn* (*Antilocapra americana*), American badger (*Taxidea taxus*)
Wetland	Common yellowthroat (*Geothlypis trichas*), long-billed curlew (*Numenius americanus*), northern harrier* (*Circus cyaneus*), red-winged blackbird (*Agelaius phoeniceus*), yellow-headed blackbird (*Xanthocephalus xanthocephalus*)
Developed/agricultural	American robin* (*Turdus migratorius*), black-billed magpie* (*Pica pica*), European starling (*Sturnus vulgaris*), lesser goldfinch (*Spinus psaltria*), mountain bluebird* (*Sialia currucoides*), mourning dove (*Zenaida macroura*), northern flicker* (*Colaptes auratus*), red-tailed Hawk* (*Buteo jamaicensis*), Swainson's hawk (*Buteo swainsoni*), white-tailed prairie dog (*Cynomys leucurus*)

* Species was observed during the field visit.

[†] Data from WGFD (2010).

The Austin Reservoir is 1 mile from the east end of the project centerline. Although the open water habitat of the reservoir is not located within the survey areas, its proximity influences the species of wildlife with potential to occur along the centerline. Many species of waterfowl and shorebird were observed on the reservoir during the field visit, including American coot (*Fulica americana*), green-winged teal (*Anas crecca*), gadwall (*Anas strepera)*, northern pintail (*Anas acuta*), northern shoveler (*Anas clypeata*), mallard (*Anas platyrhynchos*), Canada goose (*Branta canadensis*), and American avocet (*Recurvirostra americana*).

Raptor Nests

Wildlife habitat in the raptor nest study area is similar to that described for the project centerline (i.e., desert shrub, wetland, and developed/agricultural habitats). These wildlife habitat types provide little habitat for raptors because of a lack of structure for nesting. Few, scattered trees and power poles occur in the raptor nest study area. One grouping of three raptor nests was observed in the northeast portion of the raptor nest study area (near the Austin Reservoir), and a single nest was observed near the north leg of the centerline (Figure 3). All observed nests were inactive. All observed nests were located in trees; no nests were observed on power poles. All observed nests were in good condition and were of the size that could either be used by a hawk (i.e., red-tailed hawk [*Buteo jamaicensis*] or Swainson's hawk [*Buteo swainsoni*]) or a common raven [*Corvus corax*]. These species will often interchange nests. A dead red-tailed hawk was found on the road approximately 250 feet north of the Austin Reservoir nests. The cause of death was unclear. See Appendix C for photographs of the nests and dead hawk.

Over eight adult male and female northern harriers (*Circus cyaneus*) were observed in and near the saline depression wetlands of the raptor nest study area, primarily near the Austin Reservoir. Two adult males were observed in "sky dancing" behavior, by which the male conducts an aerial display of u-shaped undulations, covering a distance of up to 1 kilometer in height each time. This display is used to advertise territory occupancy and to court females (Smith et al. 2011), and it signifies that this species is breeding in the raptor nest study area. This species nests on the ground in open drained and non-drained wetlands (Smith et al. 2011). Species-specific surveys were not conducted to locate northern harrier nests.

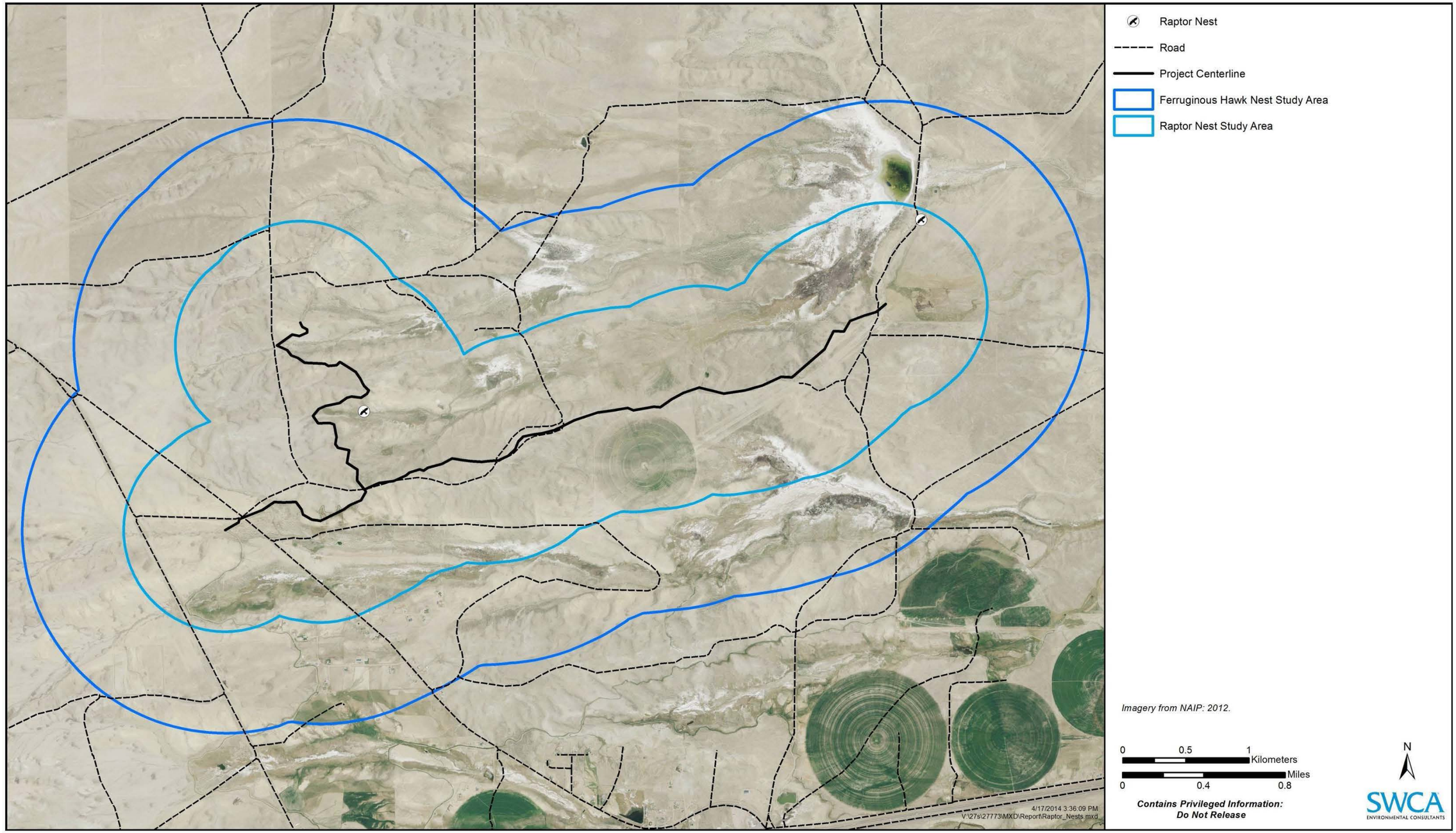

Figure 3. Raptor nest results in relation to the project centerline, raptor nest study area, and ferruginous nest hawk study.

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Ferruginous Hawk Nests

In addition to the general raptor nest survey, special attention was given to the ferruginous hawk nest study area (see Figure 3) to determine whether nesting habitat is present for this species. Nesting habitat generally consists of juniper woodlands. No nesting habitat was observed.

Special-Status Species

The following sections report the federal- and state-listed species with potential to occur along the project centerline. Collectively, these are referred to as special-status species. For more detailed information on each species and its potential to occur along the project centerline, see Appendix B.

Three federally-listed species have the potential to occur in Uinta County, Wyoming. Table 3 displays each species' status, habitat association, and a rating of potential for occurrence along the project centerline.

Table 3. Federally Endangered, Threatened, Candidate, and Proposed Threatened Species that Occur in Uinta County and Potential for Each to Occur in the Project Centerline

Species	Status	Habitat Association*	Potential for Occurrence along the Proposed Project Centerline†
Greater sage-grouse *Centrocercus urophasianus*	Candidate	Scattered populations of this species occur throughout much of the state. Populations occur primarily in habitat dominated by sagebrush, especially basin-prairie and mountain foothills shrub lands. During the summer, wet-moist meadows, alfalfa, and irrigated meadows also serve as habitat when immediately adjacent to sagebrush.	Moderate. According to the WGFD database, there is no sage-grouse core area near the project centerline. However, a lek is approximately 1.85 miles northwest of the north leg of the project centerline. This species could use the sagebrush habitat that intersects with the centerline and also move across the project centerline while en route to higher quality habitat.
Yellow-billed cuckoo *Coccyzus americanus*	Proposed threatened	This species nests primarily in large stands of cottonwood-riparian habitat below 7,000 feet. It is a riparian obligate species that prefers extensive areas of dense thickets and mature, deciduous, cottonwood gallery forests near water. Each nesting pair requires a minimum of 25 acres of broad-leafed forest.	None. Habitat for this species does not occur along the project centerline.
Black-footed ferret *Mustela nigripes*	Endangered	This species is a habitat and dietary specialist of prairie dogs and is seldom found outside of prairie dog colonies in basin-prairie shrublands, sagebrush-grasslands, and grasslands. Important habitat considerations include size of prairie dog complex, prairie dog population size and density, spatial arrangement of prairie dog colonies, and potential for disease.	Low. Although prairie dog colonies were observed near the project centerline, they occur in small and isolated colonies. It is unlikely they would support black-footed ferrets.

* Data from WGFD (2010).

† Definitions of potential: *None* = Habitat for this species does not occur; *Low* = Habitat for this species is very low quality, but occurrences of this species cannot be completely discounted; *Moderate* = This species could occur on this habitat, but the habitat is of moderate quality or would be used only occasionally for activities such as roosting and foraging; *High* = This species or a sign indicating the presence of this species was seen; this species has been otherwise documented in this area (e.g., by the WYNDD).

A request was made to WYNDD for information regarding known occurrences of SGCN in the townships and ranges that encompass the project centerline. Because the project centerline is at the intersection of three townships and ranges, the resulting WYNDD species occurrences were too broad to provide applicable information regarding potential of each species to occur along the project centerline. The WYNDD data were coupled with the special-status species lists provided for the wildlife habitat types present on the centerline (as defined in the *State Wildlife Action Plan* [WGFD 2010]) for species with potential to occur in Uinta County, as well as observations made during the site visit, for a determination of which SGCN may occur along the centerline. Appendix B provides an analysis for each species. Appendix A provides an abbreviated version of the SGCN results produced by WYNDD. Table 4 displays SGCN with a "Moderate" or "High" potential to occur along the project centerline (as defined in Appendix B) and the habitat type with which each is associated.

Table 4. Wyoming Species of Greatest Conservation Need with Moderate or High Potential for Occurrence

Habitat Type	Species
Desert shrub	Brewer's sparrow (*Spizella breweri*), burrowing owl (*Athene cunicularia*), greater sandhill crane* (*Grus canadensis*), sage sparrow (*Amphispiza belli*), sage thrasher* (*Oreoscoptes montanus*), Great Basin pocket mouse (*Perognathus parvus*), Idaho pocket gopher (*Thomomys idahoensis*), olive-backed pocket mouse (*Perognathus fasciatus*), pallid bat (*Antrozous pallidus*), pygmy rabbit (*Brachylagus idahoensis*), greater short-horned lizard (*Phrynosoma hernandesi*), Great Basin spadefoot (*Spea intermontana*)
Wetland	Big brown bat (*Eptesicus fuscus*), little brown myotis (*Myotis lucifugus*), long-eared myotis (*Myotis evotis*), pallid bat (*Antrozous pallidus*)
Agricultural/developed	Mountain plover (*Charadrius montanus*), Swainson's hawk, big brown bat, little brown myotis

* Species was observed during the field visit.

Big Game

The project centerline is located entirely in winter/yearlong pronghorn (*Antilocapra americana*) habitat (Figure 4). Pronghorn were observed while biologists were conducting the site visit. Pronghorn habitat consists of open, low-rolling, or flat terrain containing a variety of shrubs, grasses, and forbs. Mule deer (*Odocoileus hemionus*) winter/yearlong habitat occurs 0.25 mile south of the project centerline.

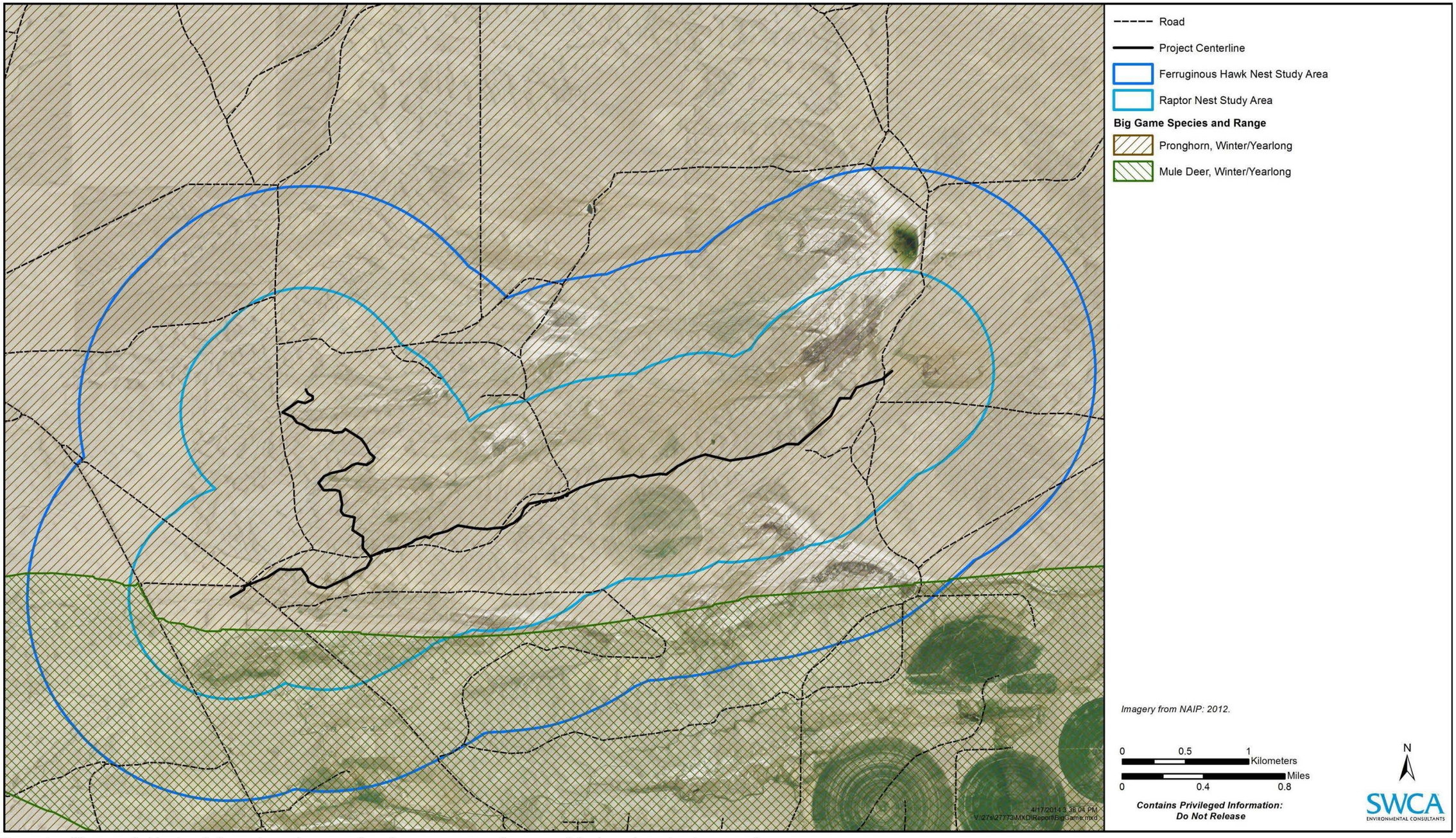

Figure 4. Big-game habitat in relation to the project centerline, the raptor nest study area, and the ferruginous hawk nest study area.

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REQUIRED ACTIONS

During construction of the canal replacement, several actions are required to be in compliance with relevant environmental regulations. These actions are in place to avoid adverse impacts to federally protected natural resources (e.g., birds and active bird nests).

- To comply with the Migratory Bird Treaty Act, vegetation (i.e., trees, shrubs, and herbaceous plants) should not be removed during the bird breeding season (March–August, depending on the species of concern and weather in a given year). If construction will occur during this time period, bird nest clearance surveys should be done by a qualified biologist to verify the absence of nests prior to vegetation removal. If nests are found, further coordination with USFWS will be required. Construction activities occurring completely outside the nesting season do not necessitate surveys.
- If construction occurs during the 2015 raptor nesting season (January 1–September 30), the inactive nests described in this report should be checked for signs of nesting activity. If the nest is occupied, the nesting species should be determined by a qualified biologist, and the appropriate seasonal and spatial buffer, as identified by the USFWS Wyoming Field Office, should be applied.
- If construction occurs during the burrowing owl nesting season (April 1–September 15), burrowing owl nesting habitat (i.e., prairie dog burrows) within 0.25 mile of the project centerline should be delineated and surveyed for the presence of nesting owls.
- Although no infestations of noxious or invasive weeds were identified on the project centerline, ground disturbance will often result in the establishment of plant pests. Best practices (such as weed treatment prior to construction) and equipment cleaning should be implemented as part of this project.

SUMMARY

Three wildlife habitat types intersect with the project centerline: desert shrub, wetland, and agricultural/developed. A suite of common wildlife species occurs in each wildlife habitat type. There are no federally listed species with high potential to occur along the project centerline. Greater sage-grouse, a candidate species, has moderate potential to use the project habitat. Seventeen SGCN have potential to occur along the project centerline. The project centerline occurs in winter/yearlong pronghorn habitat and near winter/yearlong mule deer habitat. The requirements listed above must be followed to be compliant with the Migratory Bird Treaty Act.

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Appendix A

Abbreviated WYNDD Sensitive Species Results Table

Table A1. Abbreviated WYNDD Sensitive Species Results Table

Scientific Name	Common Name	Township and Range with Species Detection
Anaxyrus boreas - Eastern Clade	Eastern clade western toad	Township 16 North, Range 114 West
Anaxyrus boreas - Eastern Clade	Eastern clade western toad	Township 16 North, Range 115 West
Lithobates pipiens	Northern leopard frog	Township 16 North, Range 114 West
Lithobates pipiens	Northern leopard frog	Township 16 North, Range 115 West
Ambystoma mavortium	Tiger salamander	Township 16 North, Range 114 West
Ambystoma mavortium	Tiger salamander	Township 16 North, Range 115 West
Recurvirostra americana	American avocet	Township 16 North, Range 114 West
Recurvirostra americana	American avocet	Township 16 North, Range 115 West
Recurvirostra americana	American avocet	Township 17 North, Range 114 West
Pelecanus erythrorhynchos	American white pelican	Township 16 North, Range 114 West
Pelecanus erythrorhynchos	American white pelican	Township 16 North, Range 115 West
Haliaeetus leucocephalus	Bald eagle	Township 16 North, Range 114 West
Haliaeetus leucocephalus	Bald eagle	Township 16 North, Range 115 West
Chlidonias niger	Black tern	Township 17 North, Range 114 West
Nycticorax nycticorax	Black-crowned night-heron	Township 16 North, Range 114 West
Himantopus mexicanus	Black-necked stilt	Township 16 North, Range 114 West
Himantopus mexicanus	Black-necked stilt	Township 17 North, Range 114 West
Spizella breweri	Brewer's sparrow	Township 16 North, Range 114 West
Spizella breweri	Brewer's sparrow	Township 16 North, Range 115 West
Spizella breweri	Brewer's sparrow	Township 17 North, Range 114 West
Bucephala albeola	Bufflehead	Township 16 North, Range 114 West
Bucephala albeola	Bufflehead	Township 16 North, Range 115 West
Athene cunicularia	Burrowing owl	Township 16 North, Range 115 West
Athene cunicularia	Burrowing owl	Township 17 North, Range 114 West
Larus californicus	California gull	Township 16 North, Range 114 West
Bucephala clangula	Common goldeneye	Township 16 North, Range 114 West
Bucephala clangula	Common goldeneye	Township 16 North, Range 115 West
Sayornis phoebe	Eastern phoebe	Township 16 North, Range 115 West
Buteo regalis	Ferruginous hawk	Township 16 North, Range 114 West
Buteo regalis	Ferruginous hawk	Township 16 North, Range 115 West
Buteo regalis	Ferruginous hawk	Township 17 North, Range 114 West
Sterna forsteri	Forster's tern	Township 16 North, Range 114 West
Aquila chrysaetos	Golden eagle	Township 16 North, Range 114 West
Aquila chrysaetos	Golden eagle	Township 16 North, Range 115 West
Aquila chrysaetos	Golden eagle	Township 17 North, Range 114 West
Centrocercus urophasianus	Greater sage-grouse	Township 16 North, Range 114 West
Centrocercus urophasianus	Greater sage-grouse	Township 16 North, Range 115 West

Table A1. Abbreviated WYNDD Sensitive Species Results Table

Scientific Name	Common Name	Township and Range with Species Detection
Centrocercus urophasianus	Greater sage-grouse	Township 17 North, Range 114 West
Lanius ludovicianus	Loggerhead shrike	Township 16 North, Range 115 West
Lanius ludovicianus	Loggerhead shrike	Township 17 North, Range 114 West
Numenius americanus	Long-billed curlew	Township 16 North, Range 114 West
Numenius americanus	Long-billed curlew	Township 16 North, Range 115 West
Numenius americanus	Long-billed curlew	Township 17 North, Range 114 West
Falco columbarius	Merlin	Township 16 North, Range 114 West
Falco columbarius	Merlin	Township 16 North, Range 115 West
Charadrius montanus	Mountain plover	Township 16 North, Range 114 West
Charadrius montanus	Mountain plover	Township 16 North, Range 115 West
Accipiter gentilis	Northern goshawk	Township 16 North, Range 114 West
Accipiter gentilis	Northern goshawk	Township 16 North, Range 115 West
Pandion haliaetus	Osprey	Township 16 North, Range 114 West
Falco peregrinus	Peregrine falcon	Township 16 North, Range 115 West
Larus delawarensis	Ring-billed gull	Township 16 North, Range 114 West
Larus delawarensis	Ring-billed gull	Township 16 North, Range 115 West
Aythya collaris	Ring-necked duck	Township 16 North, Range 114 West
Aythya collaris	Ring-necked duck	Township 16 North, Range 114 West
Oreoscoptes montanus	Sage thrasher	Township 16 North, Range 115 West
Oreoscoptes montanus	Sage thrasher	Township 17 North, Range 114 West
Artemisiospiza nevadensis	Sagebrush sparrow	Township 16 North, Range 114 West
Artemisiospiza nevadensis	Sagebrush sparrow	Township 16 North, Range 115 West
Artemisiospiza nevadensis	Sagebrush sparrow	Township 17 North, Range 114 West
Grus canadensis	Sandhill crane	Township 16 North, Range 114 West
Grus canadensis	Sandhill crane	Township 16 North, Range 115 West
Grus canadensis	Sandhill crane	Township 17 North, Range 114 West
Asio flammeus	Short-eared owl	Township 16 North, Range 114 West
Asio flammeus	Short-eared owl	Township 17 North, Range 114 West
Egretta thula	Snowy egret	Township 16 North, Range 114 West
Egretta thula	Snowy egret	Township 16 North, Range 115 West
Cygnus buccinator	Trumpeter swan	Township 16 North, Range 114 West
Cygnus buccinator	Trumpeter swan	Township 16 North, Range 114 West
Cygnus buccinator	Trumpeter swan	Township 16 North, Range 115 West
Cygnus buccinator	Trumpeter swan	Township 17 North, Range 114 West
Cygnus columbianus	Tundra swan	Township 16 North, Range 114 West
Cygnus columbianus	Tundra swan	Township 16 North, Range 115 West
Plegadis chihi	White-faced ibis	Township 16 North, Range 114 West

Table A1. Abbreviated WYNDD Sensitive Species Results Table

Scientific Name	Common Name	Township and Range with Species Detection
Plegadis chihi	White-faced ibis	Township 16 North, Range 115 West
Plegadis chihi	White-faced ibis	Township 17 North, Range 114 West
Grus americana	Whooping crane	Township 17 North, Range 114 West
Oncorhynchus clarkii pleuriticus	Colorado river cutthroat trout	Township 16 North, Range 114 West
Catostomus latipinnis	Flannelmouth sucker	Township 16 North, Range 114 West
Catostomus latipinnis	Flannelmouth sucker	Township 16 North, Range 115 West
Catostomus latipinnis	Flannelmouth sucker	Township 17 North, Range 114 West
Catostomus platyrhynchus	Mountain sucker	Township 16 North, Range 114 West
Gila robusta	Roundtail chub	Township 16 North, Range 115 West
Eriogonum divaricatum	Divergent buckwheat	Township 16 North, Range 114 West
Phlox opalensis	Opal phlox	Township 16 North, Range 114 West
Penstemon paysoniorum	Payson beardtongue	Township 16 North, Range 115 West
Penstemon paysoniorum	Payson beardtongue	Township 16 North, Range 115 West
Astragalus racemosus var. *treleasei*	Trelease's racemose milkvetch	Township 16 North, Range 114 West
Astragalus racemosus var. *treleasei*	Trelease's racemose milkvetch	Township 16 North, Range 115 West
Astragalus racemosus var. *treleasei*	Trelease's racemose milkvetch	Township 17 North, Range 114 West
Physaria condensata	Tufted twinpod	Township 16 North, Range 115 West
Penstemon watsonii	Watson's beardtongue	Township 16 North, Range 115 West
Ranunculus flabellaris	Yellow water-crowfoot	Township 16 North, Range 115 West
Mustela nigripes	Black-footed ferret	Township 16 North, Range 114 West
Mustela nigripes	Black-footed ferret	Township 16 North, Range 115 West
Myotis evotis	Long-eared myotis	Township 16 North, Range 115 West
Brachylagus idahoensis	Pygmy rabbit	Township 16 North, Range 115 West
Neotamias dorsalis utahensis	Utah cliff chipmunk	Township 16 North, Range 115 West
Cynomys leucurus	White-tailed prairie dog	Township 16 North, Range 114 West
Cynomys leucurus	White-tailed prairie dog	Township 16 North, Range 115 West
Cynomys leucurus	White-tailed prairie dog	Township 17 North, Range 114 West
Urocitellus elegans	Wyoming ground squirrel	Township 16 North, Range 115 West
Stagnicola elodes	Marsh pondsnail	Township 16 North, Range 115 West
Holbrookia maculata maculata	Great plains earless lizard	Township 16 North, Range 115 West
Thamnophis radix	Plains gartersnake	Township 16 North, Range 114 West
Thamnophis radix	Plains gartersnake	Township 16 North, Range 115 West
Sceloporus tristichus	Plateau fence lizard	Township 16 North, Range 115 West

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Appendix B

Special-Status Species Table

Table B1 provides an analysis of special-status wildlife species with potential to occur in sagebrush shrublands, desert shrublands, riparian, and wetlands habitats as well in the Green River Basin (fish) of Uinta County, Wyoming. The table also provides information on the potential for each species to occur along the project centerline, in the raptor nest study area (0.5-mile buffer), and in the ferruginous hawk nest study area (1-mile buffer), where each is applicable.

Table B1. Special-Status Species Table for the Austin Canal Replacement Project Wildlife Habitat Assessment

Species	Status*	Habitat Association†	Potential for Occurrence along the Proposed Project Centerline‡
Fish			
Bluehead sucker *Catostomus discobolus*	SGCN	This species occupies the main stem and tributaries of large rivers. It is sometimes found in headwaters. Large adults are associated with deep pools, undercut banks, moderate to fast current velocities, and rocky substrates.	None. Habitat for this species does not occur along the project centerline.
Bonytail *Gila elegans*	ESA(E)	This species occurs in riverine habitat downstream of Wyoming in the Yampa, Green, and Colorado River systems.	None. Habitat for this species does not occur along the project centerline.
Colorado River cutthroat trout *Oncorhynchus clarkii*	SGCN	In Wyoming, this species is found in the Green River, Blacks Fork, and Little Snake River drainages. This fish prefers cold, clear water.	None. Habitat for this species does not occur along the project centerline.
Colorado pikeminnow *Ptychocheilus lucius*	ESA(E)	This species occurs in riverine habitat downstream of Wyoming in the Yampa, Green, and Colorado River systems.	None. Habitat for this species does not occur along the project centerline.
Flannelmouth sucker *Catostomus latipinnis*	SGCN	Although preferring large rivers with deep riffles and runs, this species can also be found in smaller streams and sometimes in lakes.	None. Habitat for this species does not occur along the project centerline.
Humpback chub *Gila cypha*	ESA(E)	This species occurs in riverine habitat downstream of Wyoming in the Yampa, Green, and Colorado River systems.	None. Habitat for this species does not occur along the project centerline.
Mountain whitefish *Prosopium williamsoni*	SGCN	This species prefers large, deep, clear, cold rivers, but is also tolerant of warmer water and higher turbidity than cutthroat trout. In contrast to most trout, they do not seek cover and often inhabit open channel habitats.	None. Habitat for this species does not occur along the project centerline.
Razorback sucker *Xyrauchen texanus*	ESA(E)	This species occurs in riverine habitat downstream of Wyoming in the Yampa, Green, and Colorado River systems.	None. Habitat for this species does not occur along the project centerline.
Roundtail chub *Gila robusta*	SGCN	This species is most commonly found in pool-riffle habitats of Colorado River Basin rivers and streams. Adults are associated with low-current velocities, deep pools, undercut banks, woody debris, and boulders.	None. Habitat for this species does not occur along the project centerline.

Table B1. Special-Status Species Table for the Austin Canal Replacement Project Wildlife Habitat Assessment

Species	Status*	Habitat Association†	Potential for Occurrence along the Proposed Project Centerline‡
Birds			
American bittern *Botaurus lentiginosus*	SGCN	This species is totally dependent on wetland habitats. It usually inhabits marshes with open water in the center, gradual slopes, a band of emergent vegetation around the periphery, and idle grassland in the adjacent uplands. It prefers large wetlands, at least 7 acres, with tall, dense emergent vegetation such as cattails, bulrushes, and reeds.	None. The wetland habitat of the project centerline is not large or dense enough to support this species.
Bald eagle *Haliaeetus leucocephalus*	SGCN	This species nests near large lakes and rivers in forested habitat where there is adequate prey available and old, large-diameter cottonwood or conifer trees for nesting.	None. The trees in the raptor nest study area are not large enough to support bald eagle nesting.
Barrow's goldeneye *Bucephala islandica*	SGCN	This species uses a variety of habitats during the year. Prime breeding habitat consists of tall forest growth with hollow trees generally close to cold-water lakes, pools, or rivers. It is almost exclusively a cavity nester.	None. Habitat for this species does not occur along the project centerline.
Black tern *Chlidonias niger*	SGCN	This species inhabits biologically rich marshes and aquatic areas, and usually prefers marshes or marsh complexes greater than 40 acres. It nests in small, loose colonies, generally in areas of still water, with 25%–75% of the surface covered by emergent vegetation and well interspersed with open water.	None. This species could occur at the Austin Reservoir, but would not likely occur along the project centerline.
Black-crowned night-heron *Nycticorax nycticorax*	SGCN	This species inhabits marshes, swamps, wooded streams, and shores of lakes and ponds. It nests in colonies in emergent vegetation or in shrubs near the edge of water.	None. This species could occur at the Austin Reservoir, but would not likely occur along the project centerline.
Brewer's Sparrow *Spizella breweri*	SGCN	This species is considered a sagebrush obligate. It is closely associated with sagebrush shrublands that have abundant, scattered shrubs and short grass.	High. This species has been documented in the township and range of the project centerline. High-quality habitat for the species occurs along the project centerline.
Burrowing owl *Athene cunicularia*	SGCN	This species uses a variety of arid and semiarid environments with well-drained, level to gently sloping areas characterized by sparse vegetation and bare ground. It prefers open prairie, grassland, desert, and shrub-steppe habitats, and may also inhabit agricultural areas. It depends on mammals that dig burrows (particularly prairie dogs and ground squirrels), which it uses for nesting, roosting, and escape.	Moderate. Small patches of breeding habitat are present within 0.25 mile of the project centerline, which is the spatial buffer suggested by USFWS.
Canvasback *Aythya valisineria*	SGCN	This species required deep, open, permanent ponds, marshes, and potholes for feeding, resting, and courtship activities.	None. This species could occur at the Austin Reservoir, but would not likely occur along the project centerline.

Table B1. Special-Status Species Table for the Austin Canal Replacement Project Wildlife Habitat Assessment

Species	Status*	Habitat Association†	Potential for Occurrence along the Proposed Project Centerline‡
Caspian tern *Hydroprogne caspia*	SGCN	This species inhabits marshes and aquatic areas and prefers open areas with sparse vegetation. It nests on the ground in small colonies on sandy or gravelly beaches along lakes, rivers, and marshes. It generally forages in shallow water with enough clarity to reveal fish from above.	None. This species could occur at the Austin Reservoir, but would not likely occur along the project centerline.
Clark's grebe *Aechmophorus clarkii*	SGCN	This species inhabits marshes and lakes, usually with extensive areas of open water and bordered by tall emergent vegetation.	None. This species could occur at the Austin Reservoir, but would not likely occur along the project centerline.
Common loon *Gavia immer*	SGCN	Lakes that are suitable for breeding for this species are extremely limited in Wyoming and must be at least 10 acres, free of human disturbance, between 6,000 and 8,000 feet in elevation, have clear water, islands and protected shore, and abundant populations of fish.	None. This species could occur at the Austin Reservoir, but would not likely occur along the project centerline. It would not breed on Austin Reservoir, but could stop over on migration.
Ferruginous hawk *Buteo regalis*	SGCN	This species inhabits semiarid country, primarily grasslands, basin-prairie shrublands, and badlands. It requires large tracts of relatively undisturbed rangeland and nests on rock outcrops, the ground, cut banks, cliff ledges, or trees.	Low. A 1-mile radius around the project centerline (ferruginous hawk nest study area) was searched for nesting habitat for this species. None was found. The species could breed outside of the ferruginous hawk nest study area and use the study area to forage.
Forster's tern *Sterna forsteri*	SGCN	This species inhabits freshwater marshes and marshy borders of ponds and lakes, and prefers large marsh complexes with vegetated nest sites near patches of open water.	None. This species could occur at the Austin Reservoir, but would not likely occur along the project centerline.
Franklin's gull *Leucophaeus pipixcan*	SGCN	This species inhabits marshes and sloughs with sparse emergent vegetation, such as cattails, bulrushes, or reeds, but scavenges in most open habitats below 8,000 feet.	None. This species could occur at the Austin Reservoir, but would not likely occur along the project centerline.
Greater sage-grouse *Centrocercus urophasianus*	S-ESA (C); SGCN	Scattered populations of this species occur throughout much of the state. Populations occur primarily in habitat dominated by sagebrush, especially basin-prairie and mountain foothills shrublands. During the summer, wet-moist meadows, alfalfa, and irrigated meadows also serve as habitat when immediately adjacent to sagebrush.	Moderate. According to the WGFD database, there is no sage-grouse core area near the project centerline. However, a lek is approximately 1.85 miles northwest of the north leg of the project centerline. The species could use the sagebrush habitat that intersects with the centerline and also move across the project centerline while en route to higher quality habitat.
Greater sandhill crane *Grus canadensis*	SGCN	This species exhibits high fidelity to breeding sites. Typical nesting habitat occurs in river valleys, marshes, and wet meadows of western and central Wyoming, particularly in ranching country where human populations are low. It occupies wet-moist meadow grasslands, sedge meadows, irrigated native and introduced meadows, and marshes.	High. This species was observed in the desert shrub and wetland habitats of the project centerline while biologists were on-site. There is breeding habitat near the Austin Reservoir.

Table B1. Special-Status Species Table for the Austin Canal Replacement Project Wildlife Habitat Assessment

Species	Status*	Habitat Association†	Potential for Occurrence along the Proposed Project Centerline‡
Lesser scaup *Aythya affinis*	SGCN	Preferred breeding habitat for this species consists of permanent, intermittently exposed, and semipermanent wetlands greater than 2 acres in size. Alkali wetlands are relatively poor habitat for reproduction due to the lack of vegetative cover along the margin.	None. This species could occur at the Austin Reservoir, but would not likely occur along the project centerline. It would not breed near the reservoir, but could stop over during migration.
Mountain plover *Charadrius montanus*	SGCN	This species inhabits low, open habitats such as arid short-grass and mixed-grass prairie with scattered clumps of cacti and forbs and saltbush habitats of the shrub-steppe of central and western Wyoming. It prefers to nest in large, flat grassland expanses with less than 5% slope; sparse, short vegetation (4 inches or less); and bare ground. It is adapted to areas that have been disturbed by prairie dogs, heavy grazing, or fire.	Moderate. This species is documented in the Wyoming Natural Diversity Database as occurring in the townships and ranges of the project centerline. Breeding habitat for the species occurs along the project centerline. Small prairie dog colonies were observed within 0.25 mile of the project centerline.
Redhead *Aythya americana*	SGCN	In the Intermountain West, this species uses permanently and semipermanently flooded palustrine wetlands for breeding. Wetlands that are 5 acres or larger and not farther than 0.25 mile from large permanent or semipermanent lakes provide optimum nesting habitat. Stable water levels are important to nesting success.	None. This species could occur at the Austin Reservoir, but would not likely occur along the project centerline.
Sage sparrow *Amphispiza belli*	SGCN	This species is considered a sagebrush obligate. It prefers sagebrush shrublands with tall shrubs (1–2 meters) and low grass cover, where sagebrush is clumped in a patchy landscape. It requires a large block of unfragmented habitat to successfully breed and survive.	High. Nesting habitat occurs for this species in the sagebrush habitat along the project centerline.
Sage thrasher *Oreoscoptes montanus*	SGCN	This species is considered a sagebrush obligate. It inhabits prairie and foothills shrubland where sagebrush is present. It prefers shrublands with tall shrubs and low grass cover.	High. This species was observed while biologists were on-site. Nesting habitat for this species occurs in the sagebrush habitat along the project centerline.
Snowy egret *Egretta thula*	SGCN	This species inhabits grassy marshes, reservoirs, lakes, ponds, and wet meadows. It nests in mixed colonies and emergent vegetation or in shrubs on islands.	None. This species could occur at the Austin Reservoir, but would not likely occur along the project centerline.
Swainson's hawk *Buteo swainsoni*	SGCN	This species inhabits semi-open and open areas below 9,000 feet in elevation, including prairies, plains, shrub-steppe, large mountain valleys, savannahs, open pine-juniper woodlands, and cultivated lands with scattered trees. It nests in trees that are either isolated or in riparian areas or shelterbelts.	Moderate. Three raptor nests occur in the raptor nest study area, all in isolated trees. All were inactive at the time the study was conducted. Swainson's hawk could nest in any of these locations in the future.

Table B1. Special-Status Species Table for the Austin Canal Replacement Project Wildlife Habitat Assessment

Species	Status*	Habitat Association†	Potential for Occurrence along the Proposed Project Centerline‡
Trumpeter swan *Cygnus buccinators*	SGCN	This species inhabits isolated shallow marshes, ponds, lakes, and river oxbows located mostly away from human disturbance. For nesting, it prefers stable, quiet, and shallow waters usually greater than 10 acres in size with small islands, muskrat houses, or dense emergent vegetation. In Wyoming, the species is restricted in winter to sites where geothermal waters, springs, or other outflow from dams maintain ice-free areas of open shallow water.	None. This species could occur at the Austin Reservoir, but would not likely occur along the project centerline.
Virginia rail *Rallus limicola*	SGCN	This species prefers warm, freshwater marshes with dense emergent vegetation interspersed with open water or mudflats. It is most common in natural wetlands with irregular bottom contours, shallow water, and high abundance of invertebrates.	None. This species could occur at the Austin Reservoir, but would not likely occur along the project centerline.
White-faced ibis *Plegadis chihi*	SGCN	This species inhabits marshes, wet-moist meadows, lakes, and irrigated meadows. It nests on the ground in bulrushes, cattails, or reeds; on a floating mat; or in a low tree. It usually forages close to emergent vegetation.	None. This species could occur at the Austin Reservoir, but would not likely occur along the project centerline.
Willow flycatcher *Empidonax traillii*	SGCN	This species is a riparian obligate that uses willow or alder thickets along streams, especially where streams are bordered by open stands of cottonwoods. It is also found in brushy fields, and along edges of bogs, thickets, or groves of small trees in grasslands. The presence of water and deciduous riparian shrubs are essential habitat elements.	None. Habitat for this species does not occur along the project centerline.
Yellow-billed cuckoo *Coccyzus americanus*	ESA (PT); SGCN	This species nests primarily in large stands of cottonwood-riparian habitat below 7,000 feet. It is a riparian obligate species that prefers extensive areas of dense thickets and mature, deciduous, cottonwood gallery forests near water. Each nesting pair requires a minimum of 25 acres of broad-leafed forest.	None. Habitat for this species does not occur along the project centerline.
Mammals			
Big brown bat *Eptesicus fuscus*	SGCN	This species occupies a variety of habitats and elevations, including cottonwood riparian woodlands, sagebrush steppe, juniper woodlands, conifer forests, and aspen woodlands. It is better adapted to human habitation than most bat species and can often be found in urban areas and around manmade structures.	Moderate. Although there is no roosting habitat along the project centerline, this species likely occurs near the project centerline and uses the Austin Canal for drinking and foraging.
Great Basin pocket mouse *Perognathus parvus*	SGCN	This species is found in arid and semiarid habitats. It is strongly associated with sandy habitats where sagebrush is dominant, and primarily occupies steppe and arid open shrub and woodland habitats.	Moderate. Suitable habitat occurs along the project centerline for this species

Table B1. Special-Status Species Table for the Austin Canal Replacement Project Wildlife Habitat Assessment

Species	Status*	Habitat Association†	Potential for Occurrence along the Proposed Project Centerline‡
Idaho pocket gopher *Thymomys idahoensis*	SGCN	This species occurs in open sagebrush, grasslands, and montane meadows. It prefers soils that are shallower and stonier than those preferred by the sympatric northern pocket gopher.	Moderate. Suitable habitat occurs along the project centerline for this species.
Little brown myotis *Myotis lucifugus*	SGCN	This species occupies coniferous forest, riparian areas in the mountains and lower valleys, woodlots, shelterbelts, and urban areas up to approximately 11,000 feet. It is seldom found far from open water. During the summer, it uses a variety of roost sites, including buildings, tree cavities, loose tree bark, bridges, rock crevices, caves, and abandoned mines. It is one of the species most commonly found in human structures.	Moderate. Although there is no roosting habitat along the project centerline, this species likely occurs near the project centerline and uses the Austin Canal for drinking and foraging.
Long-eared myotis *Myotis evotis*	SGCN	This species primarily inhabits coniferous forest and woodland, including juniper, ponderosa pine, and spruce-fir. It is typically found near water and rock outcrops or cliffs. It typically forages over rivers, streams, and ponds within the forest-woodland environment. During the summer, it roosts in a variety of structures, including cavities in snags, under loose bark, stumps, buildings, rock crevices, caves, and abandoned mines.	High. Although there is no roosting habitat along the project centerline, this species likely occurs near the project centerline and uses the Austin Canal. This species is documented in the Wyoming Natural Diversity Database as occurring near the project centerline.
Long-legged myotis *Myotis volans*	SGCN	This species inhabits open, mature forest with standing dead trees, including montane and subalpine forest and ponderosa pine and juniper woodlands. During the summer, it uses a variety of roosts, including tree cavities, buildings, rock crevices, caves, abandoned mines, and under loose bark.	Low. There is no roosting habitat along the project centerline and little foraging habitat. Still, this species may occasionally use the Austin Canal for drinking and foraging.
Moose *Alces alces*	SGCN	This species occupies habitats in Wyoming that are generally similar to, but somewhat drier than those within the rest of the species' range in the rest of North America. Wyoming moose use Engelmann spruce, Douglas-fir, subalpine fir, and lodgepole pine and associated habitats, including riparian communities, especially those dominated by willow, mixed mountain shrub, and aspen. It generally summers at higher elevation in conifer forests and winters in willow and deciduous habitats. Movement from summer range to winter range typically involves descending to lower elevations where the snow pack is shallower and mobility is greater.	Low. This species may occasionally visit the willow habitat of the project centerline while moving between seasonal habitats.
Northern river otter *Lontra canadensis*	SGCN	This species prefers bog lakes with banked shores containing semi-aquatic mammal burrows and lakes with beaver lodges. They avoid waterbodies with gradually sloping shorelines of sand or gravel. In Wyoming, this species occupies lakes, streams, and aquatic habitats in cottonwood riparian, riparian shrub, willow, and marsh-swamp land habitats.	None. Habitat for this species does not occur along the project centerline.

Table B1. Special-Status Species Table for the Austin Canal Replacement Project Wildlife Habitat Assessment

Species	Status*	Habitat Association†	Potential for Occurrence along the Proposed Project Centerline‡
Olive-backed pocket mouse *Perognathus fasciatus*	SGCN	This species occupies a variety of arid and semiarid upland habitats, primarily sparsely vegetated grasslands and sagebrush-grasslands. It prefers loose sandy to clay soils for burrowing.	Moderate. Suitable habitat for this species is present along the project centerline.
Pallid bat *Antrozous pallidus*	SGCN	This species generally inhabits low desert shrublands, juniper woodlands, and grasslands, and occasionally cottonwood-riparian zones in those habitats. It is most common in low, arid regions with rocky outcroppings, particularly near water. During the summer, it usually roosts in rock crevices and buildings, but also uses rock piles, tree cavities, shallow caves, and abandoned mines.	Moderate. Although there is no roosting habitat along the project centerline, this species likely occurs near the project centerline and uses the Austin Canal.
Preble's shrew *Sorex prebeli*	SGCN	The habitat needs of this species are poorly known. Most have been collected in arid and semiarid sagebrush-grassland habitats and openings in subalpine coniferous forest. However, it has also and more recently been known to occur near creeks and bogs bordered by willow or riparian shrub, in wet areas in open conifer stands, and areas covered by marsh grasses.	None. Habitat for this species does not exist along the project centerline.
Pygmy rabbit *Brachylagus idahoensis*	SGCN	This species is patchily distributed throughout the Great Basin and some adjacent intermountain areas from east-central Washington, south to east-central California, and east to Utah and Wyoming. In Wyoming, it occurs only in the southwestern portion of the state.	Moderate. This species has been documented in Township 16 North, Range 115 West, which is where the west portion of the project centerline occurs. Breeding habitat for the species could occur in the sagebrush habitat of the project centerline. Species-specific studies were not conducted.
Spotted bat *Euderma maculatum*	SGCN	This species occupies a variety of habitats, from desert scrub to coniferous forest, although it is most often observed in low deserts and basins and juniper woodlands. It occurs primarily in association with canyons, prominent rock features, and permanent water sources. It roosts in cracks and crevices in high cliffs and canyons and occasionally roosts in buildings, caves, or abandoned mines.	Low. Although there is no roosting habitat along the project centerline, this species may occasionally occur near the project centerline and use the Austin Canal.
Vagrant shrew *Sorex vagrams*	SGCN	This species inhabits riparian shrub, moist meadow grasslands, bogs, and riparian or marsh habitats with moist soil in a variety of habitat types from sagebrush-grassland and mixed shrubland to conifer forest. It prefers areas with accumulated leaf litter and rotting logs.	None. Habitat for this species does not exist along the project centerline.
Water vole *Macrotus richardsoni*	SGCN	This species inhabits moist subalpine and alpine meadows of willows, grasses, and forbs atop deep soils. It usually remains within approximately 17 meters of low-gradient streams with narrow channels. It nests in a burrow dug into an overhanging streambank, usually with both aboveground and underwater entrances.	None. Habitat for this species does not exist along the project centerline.

Table B1. Special-Status Species Table for the Austin Canal Replacement Project Wildlife Habitat Assessment

Species	Status*	Habitat Association†	Potential for Occurrence along the Proposed Project Centerline‡
Reptiles			
Great Basin gophersnake *Pituophis catenifer deserticola*	SGCN	This species inhabits sagebrush and desert habitats in the plains zone. It needs deep, loose soils and animal burrows for shelter. Little is known about its habits in Wyoming.	None. Habitat for this species does not exist along the project centerline.
Greater short-horned lizard *Phrynosoma hernandesi*	SGCN	This species ranges from semiarid plains to the mountains; it can be found in short-grass prairie and sagebrush habitats, and open pine-spruce, pinyon-juniper, and spruce-fir forests. The ground may be stony, sandy, or firm, but usually has fine loose soil present, in which the lizards burrow.	Moderate. Suitable habitat occurs along the project centerline for this species.
Northern tree lizard *Urosaurus ornatus wrighti*	SGCN	This species inhabits rocky cliffs, canyon walls, steep exposures of bedrock, and large boulders in sagebrush and juniper habitats.	None. Habitat for this species does not occur along the project centerline.
Valley gartersnake *Thamnophis sirtalis fitchi*	SGCN	This species inhabits lower elevation grasslands, woodlands, shrub brush, chaparral, forests, riparian areas, marshes, swamps, meadows, pastures, old fields, cemeteries, and vacant lots. They are usually found near water or wet vegetation.	None. Habitat for this species does not occur along the project centerline.
Amphibians			
Boreal Toad *Anaxyrus boreas boreas*	SGCN	In Wyoming, this species inhabits wet areas in foothills, montane, and subalpine zones from 6,500 to 11,500 feet in elevation.	None. Habitat for this species does not occur along the project centerline.
Great Basin spadefoot *Spea intermontana*	SGCN	Although this species is found in sagebrush flats and semi-desert shrublands, it requires loose soils and water (permanent or temporary) for breeding. Breeding sites may differ from year to year. Successful breeding usually occurs in wetlands.	Moderate. Breeding habitat for this species could occur near the Austin Canal, Austin Reservoir, and various cattle ponds.
Northern leopard frog *Lithobates pipiens*	SGCN	This species can be found in or near permanent water in the plains, foothills, and montane zones ranging to over 8,500 feet in elevation. Its preferred habitats are swampy cattail marshes on the plains and beaver ponds in the foothills and montane zones.	None. Habitat for this species does not occur along the project centerline.

* S-ESA = Species listed under the Endangered Species Act :(E) = Endangered, (T) = Threatened, (C) = Candidate, (PT) = Proposed Threatened; SGCN = Wyoming Species of Greatest Conservation Need.

† Data from Wyoming's *State Wildlife Action Plan*. 2010. Available at: http://wgfd.wyo.gov/web2011/Departments/Wildlife/pdfs/SWAP_2012_FULL0001898.pdf. Accessed on April 16, 2014.

‡ Definitions of potential: None = Habitat for this species does not occur, Low = Habitat for this species is very low quality, but occurrences of this species cannot be completely discounted, Moderate = This species could occur on this habitat, but the habitat is of moderate quality or would be used only occasionally for activities such as roosting and foraging, High = This species or a sign indicating the presence of this species was seen; this species has been otherwise documented in this area (e.g., by the WYNDD).

Appendix C

Photographs

Figure C1. Wildlife habitat near the project centerline.

Figure C2. Greater sandhill cranes near the project centerline.

Figure C3. Dead red-tailed hawk near the Austin Reservoir nests.

Figure C4. Two of the Austin Reservoir nests.

Figure C5. Close-up of two of the Austin Reservoir nests.

Figure C6. The third Austin Reservoir nest in right-most tree.

Figure C7. Tree where single nest is located.

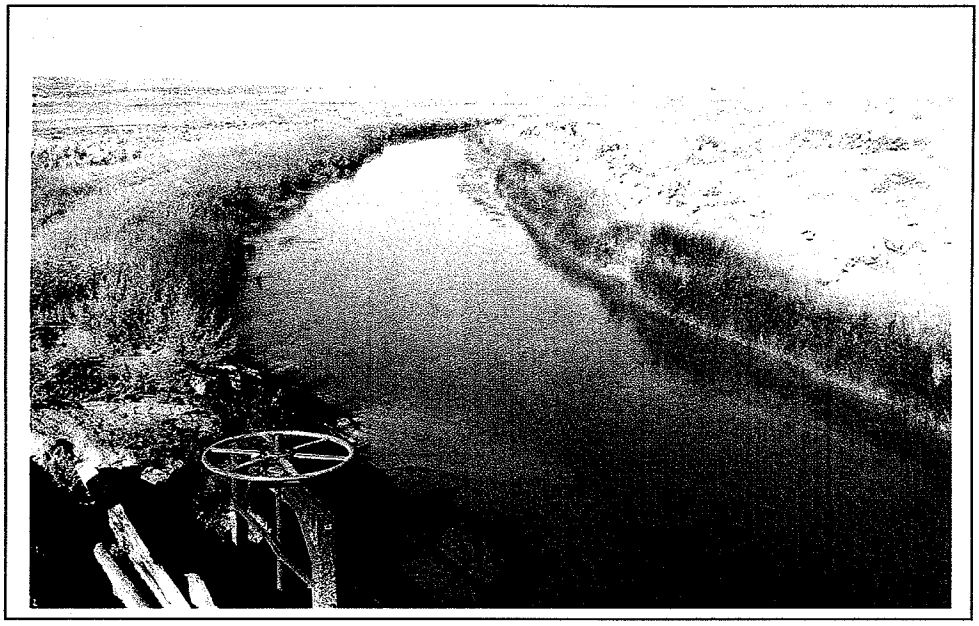
Figure C8. Austin Reservoir.

APPENDIX B

WETLAND DETERMINATION

Austin and Wall Canals

Request for Irrigational Exemption



August 2010

Prepared for:

U.S. Army Corps of Engineers

Prepared By:

Bryce Nielson

Eco Bear Lake, LLC

P.O. Box 54

Garden City, UT 84028

435.994.1649

Introduction

This document has been complied to provide information to the U. S. Army Corps of Engineers, Wyoming Regulatory Office about the Austin and Wall Canals project to determine if proposed construction falls under the "Exemption for Construction and Maintenance of Irrigation Ditches Under Section 404 of the Clean Water Act. An condensed overview of the Project will be included along with field observations and interpretations made by Bryce Nielson, Wetland delineator, Eco Bear Lake.

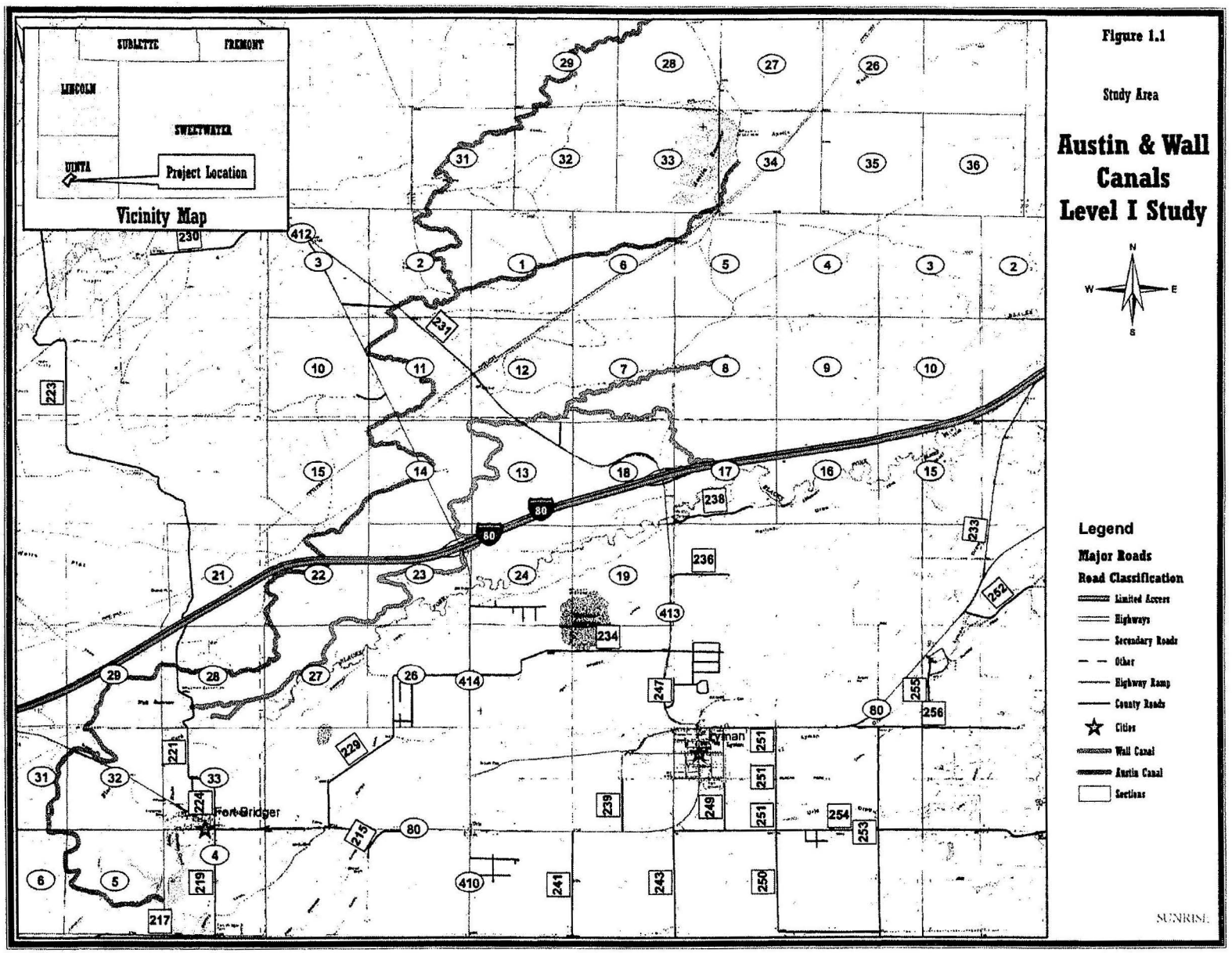
Overview

The Austin and Wall Canals are located in the Bridger Valley of Southwestern Wyoming near the towns of Fort Bridger, Lyman, and Mountain View (see Figure 1.1 Study Area). The area is dry and cold with an average annual precipitation of 8 to 10 inches and a growing season of 90 to 110 days. Crops grown are primarily native hay and pasture.

AUSTIN CANAL

The Austin Canal was permitted in 1909. The date of construction is unknown, however the water right permit application indicates that water was beneficially used by 1933. The canal is officially known as the Uinta Number 3 Ditch, and is approximately 19 miles in length. The source of the canal is the Black's Fork River which is a tributary of the Green River. Water flows in the canal from May through September. The Austin Canal is wide and has a slow velocity, especially in the upper areas. The long length and wide bottom result in significant losses. The canal separates into two branches approximately 12 miles from the diversion. One branch is 1.5 miles long and the other branch is 3.5 miles in length.

The Austin Canal runs for more than 100,000 feet from the diversion on the Blacks Fork River at slopes ranging from 0.04 to 1.0 percent. The average slope is roughly 0.17 percent. The canal is generally in good condition with a width of 12 to 20 feet. The canal appears to have adequate capacity to carry the permitted flow rate of 57 cubic feet per second.


SUBLETTE
FREMONT
LINCOLN
SWEETWATER
UINTA
Project Location
Vicinity Map
Figure 1.1
Study Area
Austin & Wall Canals Level I Study
N
W
E
S
Legend
Major Roads
Road Classification
Limited Access
Highways
Secondary Roads
Other
Highway Ramp
County Roads
Cities
Wall Canal
Austin Canal
Sections
Fort Bridger
Lyman
SUNRISE

During August 2010, a large portion of the Austin Canal was observed on foot or other vehicle The overall canal cross section was in good condition with adequate freeboard. Dike widths varied, and some were very rough due to past ditch maintenance, cattle/sheep trails, and badger/rodent holes. The banks are relatively steep and grass covered.
Most areas of the canal have algae growth across the majority of the canal floor cross section. This impedes the flow of water and reduces the effective capacity of the ditch.
Some areas of deposited silt were also observed. These deposits were likely made during high flows as the velocity of the water is generally slow to moderate.

Seepage on the Austin Canal is apparent in some areas due to the vegetation growing adjacent to and down gradient of the ditch. There were no areas which were considered wetlands either past or present. The condition of head gates on the Austin Canal varies from good to non-functional. Portions of the canal have significant erosion issues, both on the main stem and on laterals. The majority of the eroded areas are located on the lower portion of the canal below the split. Some head gates have had the majority of the bank behind the concrete deteriorate due to cattle, even to the point that water surrounds the head gate

WALL CANAL

The Wall Canal which is officially known as the Deeben-Heinze Ditch was permitted in 1904 and constructed in approximately 1907. The canal has diversions at both the Wall Reservoir and the Black's Fork River which is a tributary of the Green River. Water is diverted into the canal from May through September. The Wall Canal is approximately 12 miles in length.

The Wall Canal runs for more than 60,000 feet from the diversion on the Blacks Fork River and from the Wall Reservoir at slopes ranging from 0.02 to 0.3 percent. The average slope is roughly 0.10 percent. The canal is generally in good condition with a width of 10 to 14 feet. The canal has adequate capacity to carry the permitted flow rate of 38.8 cfs.

During August 2010, significant portion of the Wall Canal was observed on foot or other vehicle. A majority of the observation was on foot due to limited access caused by steep slopes, fences, and so forth. The overall canal cross section was in good condition with adequate freeboard. Dike widths varied, and some were very rough due to past ditch maintenance, cattle/sheep trails, and badger/rodent holes. The banks are relatively steep and grass covered. The lower portion of the canal has extensive stands of willows lining the banks. Most areas of the canal have algae growth across the majority of the canal floor cross section. This impedes the flow of water and reduces the effective capacity of the ditch.

Conceptual Canal Construction

Improvements to the Austin and Wall Canals fall into two categories. The first category is maintenance. This includes removing obstructions to flow, maintaining freeboard on ditch bank, and keeping head gates in good working condition, including backfill and riprap around outfall structures.

Construction includes those that could be carried out along significant lengths of the canals and that may modify the way maintenance and operations are conducted in the future. These types of improvements include reducing or eliminating the water losses exhibited in the canals by various means including soil or polymer based amendments or coatings, synthetic liners, concrete lining, and or piping of sections or the entire length of the canals. One or more of these approaches could be used on sections of the canals and reservoir beginning with those sections where excessive.

Polyacrylamide (PAM). One maintenance-level method that can be applied at a relatively low cost is the application of polyacrylamide (PAM) based products. This material is applied by a spray-on surface slurry method and/or granular surface method, and acts as a flocculent on the soil surface forming a layer on the canal invert that slows seepage. This "gel" layer is not permanent and must be re-applied; in some cases more than once per year. There is minimal preparation required for application of the PAM and it is not intended to withstand future maintenance and cleaning activities. The low cost of PAM and its temporary nature make it attractive from a test case standpoint.

Synthetic and Manufactured Earthen Liner. The next level of improvements to prevent seepage include a synthetic liner type system such as EPDM (ethylene propylene diene monomer), HDPE (high density polyethylene), or a composite bentonite/geotextile-type manufactured geocomposite liner (GCL) such as Bentomat or Claymax, any of which are installed in a prepared canal section. These liner systems are permanent and once installed preclude using heavy equipment to remove material from the liner.

Polypropylene/Polyurea Synthetic Liner. A relatively recent addition to the suite of liner alternatives is a dual layer synthetic liner consisting of a 6 oz polypropylene mat base followed by a spray-on polyurea coating of 40 mils. The liner is typically placed on a prepared soil bed but can also be run over rock ledges and difficult terrain with success. Roughness in the prepared surface will reflect up to the final product. It appears to be a promising and durable alternative with accelerated life tests surpassing 40 years

Concrete Liner. Concrete is a third lining material that is widely used on canals. Depending on the type of construction joints used, concrete can furnish a relatively impermeable surface.

Unlike synthetic liners, a concrete-lined section requires no keyway and consequently can be placed on the uphill side of the canal from the lee side without requiring access to the uphill side. Concrete lining is costly compared to the above alternatives. Concrete could have application in isolated areas of the where rock ledges are crossed.

Piping. From a water conservation standpoint, piping of a canal or ditch can have the greatest return in terms of reduced infiltration and evaporation. Piping can be constructed under either an open channel or a pressurized scenario.

Exemptions for Construction or Maintenance of Irrigation Ditches

In reviewing the conceptual designs of this project and making two field trips to observe the ecological conditions of the ditches the following conclusions were made (The conclusions are based on the Regulatory Guidance Letter Number 07-02).

1. The project deals only with irrigation ditches as defined in the Regulatory Guidance Letter and no drainage ditches are involved. All are upland ditches.
2. The existing route of the system and water diversion structures would be maintained.
3. The majority of the proposed "work" would be considered "construction". There exists the possibility of "maintenance" in some scenarios.
4. There will not be any discharge of fill or dredge material into a water of the U.S. Construction would occur when the ditch was dewatered.
5. Any sites along the irrigation ditch route that may be interpreted (none were observed) would have been created as a result of irrigation and therefore would not be considered "wetlands".
6. The "Recapture Provision", in my determination, would not apply in this Project.
7. Given the data and field observations in this document and following the **Flowchart for Processing Exemptions under (404)(f)(1) and (404) (f) (2)** it may be assumed, with the U.S. Army Corps of Engineers concurrence, the ditches in the Austin and Wall Canals Project would be exempt from 404 regulations.

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
WYOMING REGULATORY OFFICE
2232 DELL RANGE BOULEVARD, SUITE 210
CHEYENNE WY 82009-4942

September 24, 2010

Wyoming Regulatory Office

Mr. Judd Redden
Austin & Wall Irrigation District
353 Eagle Lane
Lyman, Wyoming 82937

Dear Mr. Redden:

This letter is in response to a request we received on August 27, 2010, from Eco Bear Lake, LLC (EBL) on your behalf, for a jurisdictional determination concerning maintenance and upgrade of irrigation conveyance associated with the Austin & Wall Irrigation District (AWID) near Fort Bridger, Wyoming. The project involves Austin Canal and Wall Canal located in Sections 5 and 6, Township 15 North, Range 115 West; Sections 1, 2, 3, 10, 11, 12, 13, 14, 15, 21, 22, 23, 24, 26, 27, 28, 29, 31, and 32, Township16 North, Range 115 West; Sections 5, 6, 7, 8, 17 and 18, Township 16 North, Range 114 West; and Sections 28, 29, 31, 32, 33, and 34, Township 17 North, Range 114 West, Uinta County, Wyoming.

The U.S. Army Corps of Engineers regulates the placement of dredged and fill material into waters of the United States under Section 404 of the Clean Water Act (33 U.S.C. 1344). The Corps' regulations are published in the *Code of Federal Regulations* as 33 CFR Parts 320 through 332. Detailed information on Section 404 requirements in Wyoming can be obtained from our website at: https://www.nwo.usace.army.mil/html/od-rwy/Wyoming.htm

Based on the information received from EBL, proposed maintenance activities include removal of obstructions to flow, repair and replacement of head gates, installation of backfill and riprap around outfall structures. Proposed improvements include application of soil or polymer amendments or coatings, synthetic liners, concrete lining, and piping of canal sections. The proposed maintenance and improvement activities will be limited to the canals and appurtenant structures on 19 miles of Austin Canal (Uinta Number 3 Ditch) and 12 miles of Wall Canal (Deeben-Heinze Ditch), as shown in Figure 1.1 of the information submitted to our office on August 27, 2010. Existing seepage wetlands, canal laterals or ditch drains will be left in place, open, and unfilled to allow natural drying after irrigation sources have been removed. These areas may revert to upland over time if supporting hydrology was exclusively supported by artificial irrigation.

Upon review of the information provided, it has been determined that the maintenance and improvement activities as described for the Austin and Wall irrigation canals are exempt under Section 404 (f) of the Clean Water Act and Part 323.4(a)(3) of our regulations:

Construction or maintenance of farm or stock ponds or irrigation ditches or the maintenance (but not 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.

Discharge of fill in wetlands adjacent to the canals and ditches is not exempt. Discharge of fill in lateral drains that may also convey precipitation and ground water flows to other waters of the U.S. is not exempt. We recommend that monitoring wells be established in wetlands adjacent to the project laterals and in abandoned drains to demonstrate any changes in hydrology that may be associated with the removal of artificial irrigation. Sufficient time must be allowed before accurate data can be submitted to the Corps for a jurisdictional determination.

Please be aware that because a Department of the Army permit is not required, it does not eliminate the requirement to obtain any other applicable federal, state, tribal or local permits. In addition, any deviations from the plans and specifications for the project, as provided by EBL as of September 23, 2009, could require additional authorization.

Thank you for your interest in cooperating with the requirements of the U.S. Army Corps of Engineers' regulatory program. Please contact Ms. Paige Wolken at (307) 772-2300 if you have any questions regarding this determination and reference file NWO-2010- 02170.

Sincerely,

Matthew A. Bilodeau
Program Manager
Wyoming Regulatory Office

Copies Furnished:

Ryan Erickson
Sunrise Engineering
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Afton, Wyoming 83110

Bryce Nielson
Eco Bear Lake, LLC
P.O. Box 54
Garden City, UT 84028

Jeremy Zumberge
Wyoming Department of Environmental Quality
Water Quality Division
2100 West 5th Street
Sheridan, Wyoming 82801

Toney Ott
U.S. Environmental Protection Agency
Region 8, EPR-EP
1595 Wynkoop Street
Denver, Colorado 80202-1129

The Omaha District, Regulatory Branch, Wyoming Regulatory Office is committed to providing quality and timely service to our customers. In an effort to improve customer service, please take a moment to complete a Customer Service Survey found on our web site at https://www.nwo.usace.army.mil/html/od-rwy/survey.htm Paper copies of the survey are also available upon request for those without Internet access.

APPENDIX C

USFWS REPLY LETTER

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
5353 Yellowstone Road, Suite 308A
Cheyenne, Wyoming 82009

In Reply Refer To:
06E13000/WY14CPA0017

DEC 09 2013

Ryan Erickson, Project Engineer
Sunrise Engineering
P.O. Box 609
Afton, Wyoming 83110

Dear Mr. Erickson:

Thank you for your Scoping Notice dated October 11, 2013, and attached project map received in our office on October 17. The Bureau of Reclamation (BOR), along with the Wyoming Water Development Office, is proposing to prepare an Environmental Assessment for the Austin Canal Replacement Project (Project) and has requested the U.S. Fish and Wildlife Service (Service) provide comments on the proposed action. The current Project will replace approximately 6 miles of the Austin Canal located downstream (north and east) of Uinta County Road 231 with a pipeline. The proposed Project is located in Townships 16-17 North, Ranges 114-115 West, near Fort Bridger and Lyman, Uinta County, Wyoming.

You have requested information regarding species listed under the Endangered Species Act of 1973, as amended (ESA), 16 U.S.C. 1531 *et seq*. In response to your request, the Service is also providing recommendations for protective measures for threatened and endangered species in accordance with the ESA. We are also providing recommendations concerning migratory birds in accordance with the Migratory Bird Treaty Act (MBTA), 16 U.S.C. 703, and the Bald and Golden Eagle Protection Act (Eagle Act), 16 U.S.C. 668. Wetlands are afforded protection under Executive Orders 11990 (wetland protection) and 11988 (floodplain management), as well as section 404 of the Clean Water Act. Other fish and wildlife resources are considered under the Fish and Wildlife Coordination Act, as amended, 16 U.S.C. 661 *et seq.*, and the Fish and Wildlife Act of 1956, as amended, 16 U.S.C. 742a-742j.

The Service has transitioned to a new online program to deliver species lists: the Information, Planning, and Conservation (IPaC) system. To obtain a current list of endangered, threatened, proposed, and candidate species and their designated and proposed critical habitat that occur in or may be affected by actions associated with your proposed Project, please visit our website at http://ecos.fws.gov/ipac/. This website will provide you with an immediate response to your

species list request. The response will also include information regarding other Service trust authorities.

Recommendations

The National Environmental Policy Act (NEPA) analysis should disclose the full extent of proposed development, as well as the direct and indirect effects of all aspects of the Project and the cumulative impacts of past, present, and reasonably foreseeable future actions regardless of who is responsible for those actions.

Habitat Replacement Plans: The Colorado River Basin Salinity Control Act (43 U.S.C. 1571-1599) authorized the Salinity Control Program and directed the Secretary of the Interior to replace incidental fish and wildlife values foregone as a result of implementation of salinity control projects. We recommend that the analysis of fish and wildlife values foregone include all wildlife habitat types and include all natural and manmade wetland and riparian habitats lost as a result of the Project whether or not the wetlands meet the definition of jurisdictional wetlands. We also recommend that the scoring of habitat values and the development of preliminary and final wildlife habitat replacement plans involve close coordination with the Service.

Wetlands/Riparian Areas: Wetlands or riparian areas may be impacted by the proposed Project. Wetlands perform significant ecological functions which include: (1) providing habitat for numerous aquatic and terrestrial wildlife species, (2) aiding in the dispersal of floods, (3) improving water quality through retention and assimilation of pollutants from storm water runoff, and (4) recharging the aquifer. Wetlands also possess aesthetic and recreational values. If wetlands may be destroyed or degraded by the proposed action, those wetlands in the Project area should be inventoried and fully described in terms of their functions and values. Acreage of wetlands, by type, should be disclosed and specific actions should be outlined to avoid, minimize, and compensate for all unavoidable wetland impacts.

Riparian or streamside areas are a valuable natural resource and impacts to these areas should be avoided whenever possible. Riparian areas are among the most productive wildlife habitat types in North America. They support a greater variety of wildlife than any other habitat in Wyoming. Riparian vegetation plays an important role in protecting streams, reducing erosion and sedimentation as well as improving water quality, maintaining the water table, controlling flooding, and providing shade and cover. In view of their importance and relative scarcity, impacts to riparian areas should be avoided. Any potential, unavoidable encroachment into these areas should be further avoided and minimized. Unavoidable impacts to streams should be assessed in terms of their functions and values, linear feet and vegetation type lost, potential effects on wildlife, and potential effects on bank stability and water quality. Measures to compensate for unavoidable losses of riparian areas should be developed and implemented as part of the Project.

Plans for mitigating unavoidable impacts to wetland and riparian areas should include mitigation goals and objectives, methodologies, time frames for implementation, success criteria, and monitoring to determine if the mitigation is successful. The mitigation plan should also include a contingency plan to be implemented should the mitigation not be successful. In addition,

wetland restoration, creation, enhancement, and/or preservation does not compensate for loss of stream habitat; streams and wetlands have different functions and provide different habitat values for fish and wildlife resources.

Best Management Practices (BMPs) should be implemented within the Project area wherever possible. BMPs include, but are not limited to, the following: installation of sediment and erosion control devices (*e.g.*, silt fences, hay bales, temporary sediment control basins, erosion control matting); adequate and continued maintenance of sediment and erosion control devices to insure their effectiveness; minimization of the construction disturbance area to further avoid streams, wetlands, and riparian areas; location of equipment staging, fueling, and maintenance areas outside of wetlands, streams, riparian areas, and floodplains; and re-seeding and re-planting of riparian vegetation native to Wyoming in order to stabilize shorelines and streambanks.

Migratory Birds: Under the MBTA, the Eagle Act, and Executive Order 13186 (66 FR 3853; January 17, 2001), Federal agencies have an obligation to protect all species of migratory birds, including eagles and other raptors, which may occur on lands under their jurisdiction. Of particular focus are the species identified in the Service's Birds of Conservation Concern 2008. In accordance with the Fish and Wildlife Conservation Act (16 USC 2912 (a)(3)), this report identifies "species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing" under the ESA. The Birds of Conservation Concern report is intended to stimulate coordinated and proactive conservation actions among Federal, State, and private partners and is available online.

The MBTA, enacted in 1918, prohibits the taking of any migratory birds, their parts, nests, or eggs, except as permitted by regulations, and does not require intent to be proven. Section 703 of the MBTA states, "Unless and except as permitted by regulations ... it shall be unlawful at any time, by any means or in any manner, to ... take, capture, kill, attempt to take, capture, or kill, or possess ... any migratory bird, any part, nest, or eggs of any such bird...." The Eagle Act prohibits knowingly taking, or taking with wanton disregard for the consequences of an activity, any bald or golden eagles or their body parts, nests, or eggs, which includes collection, molestation, disturbance, or killing.

Removal or destruction of such nests or causing abandonment of a nest could constitute violation of one or both of the above statutes. Removal of any active migratory bird nest or nest tree is prohibited. For golden eagles, inactive nest permits are limited to activities involving resource extraction or human health and safety. Mitigation, as determined by the local Service field office, may be required for loss of these nests. No permits will be issued for an active nest of any migratory bird species, unless removal of an active nest is necessary for reasons of human health and safety. Therefore, if nesting migratory birds are present on or near the project area, timing is a significant consideration and needs to be addressed in project planning.

Work that could lead to the take of a migratory bird or eagle, their young, eggs, or nests (e.g., if you are going to erect new roads, or power lines in the vicinity of a nest), should be coordinated with our office before any actions are taken. If nest manipulation is proposed for this project, the project proponent should contact the Service's Migratory Bird Office in Denver at 303-236-8171 to see if a permit can be issued for this project. No nest manipulation is allowed without a

permit. If a permit cannot be issued, the project may need to be modified to ensure take of a migratory bird or eagle, their young, eggs or nest will not occur.

Eagle/Raptor: Enclosed please find our general recommendations for the protection of eagles and other raptor species. We strongly encourage project proponents to fully implement the protective measures described in the enclosures in order to help ensure compliance with the MBTA and the Eagle Act. We are also available to assist you in developing a project specific plan to address the MBTA and Eagle Act concerns.

Endangered Species Act

In accordance with section 7(c) of the ESA, we have determined that the following species or their designated habitat may be present in the proposed Project area. We would appreciate receiving information as to the current status of each of these species within the proposed Project area.

Endangered, Threatened, Proposed, and Candidate Species
And Their Designated and Proposed Critical Habitat That Occur
In or May Be Affected by Actions in the Proposed Project Area
December 2013

Species/Critical Habitat	Scientific Name	Status	Habitat
Colorado River Fish • Bonytail, • Colorado Pikeminnow, • Humpback Chub, • Razorback Sucker	 *Gila elegans* *Ptychocheilus lucius* *Gila cypha* *Xyrauchen texanus*	 Endangered Endangered Endangered Endangered	Riverine habitat downstream of Wyoming in the Yampa, Green, and Colorado River systems
Colorado River Fish Critical Habitat	Designated for Colorado River Fish in riverine habitat downstream of Wyoming in the Yampa, Green, and Colorado River systems (see 50 CFR 17.95(e))		
Ute Ladies'-tresses	*Spiranthes diluvialis*	Threatened	Seasonally moist soils and wet meadows of drainages below 7,000 ft. elevation
Yellow-billed Cuckoo (Western)	*Coccyzus americanus*	Proposed	Riparian areas west of Continental Divide
Greater Sage-grouse	*Centrocercus urophasianus*	Candidate	Sagebrush communities

Colorado River Fish/Depletions: Formal interagency consultation under section 7 of the ESA is required for projects that may lead to depletions of water from any system that is a tributary to the Colorado River. Federal agency actions resulting in water depletions to the Colorado River system may affect the endangered bonytail (*Gila elegans*), Colorado pikeminnow (*Ptychocheilus*

lucius), humpback chub (*Gila cypha*), and razorback sucker (*Xyrauchen texanus*) and their habitat downstream in the Green and Colorado River systems. In addition, upstream depletions may affect designated critical habitat for these four species. Critical habitat is designated for Colorado River Fish in Colorado and Utah in downstream riverine habitat in the Yampa, Green, and Colorado River systems (see 50 CFR 17.95(e))

In general, depletions include evaporative losses and/or consumptive use of surface or groundwater within the affected basin, often characterized as diversions less return flows. Project elements that could be associated with depletions include, but are not limited to: ponds, lakes, and reservoirs (e.g., detention/recreation/irrigation storage/stock watering/municipal storage/power generation); drilling; hydraulic fracturing and completion of oil and gas wells; hydrostatic testing of pipelines; water wells; dust abatement; diversion structures; and water treatment facilities. Any actions that may result in water depletion should be identified. The document should include an estimate of the amount and timing of average annual water use (both historic and new uses) and methods of arriving at such estimates; location of where water use or diversion occurs, as specifically as possible; if and when the water will be returned to the system; and the intended use of the water. For salinity control projects, the document should describe what happens to the water "savings" and whether and how much of that water is returned to the system. Depending upon the details of the Project, the Service may have more specific questions regarding the potential consumptive use of water.

The Service, in accordance with the Upper Colorado River Endangered Fish Recovery Program, adopted a *de minimis* policy, which states that water-related activities in the Upper Colorado River Basin that result in less than 0.1 acre-foot per year of depletions in flow have no effect on the Colorado River endangered fish species, and thus do not require consultation for potential effects on those species. Similarly, detention basins designed to detain runoff for less than 72 hours, and temporary withdrawals of water outside of critical habitat (e.g., for hydrostatic pipeline testing) that return all the water to the same drainage basin within 30 days, are considered to have no effect and do not require consultation.

Ute Ladies'-tresses: Ute ladies'-tresses (*Spiranthes diluvialis*) is a perennial orchid, 8 to 20 inches tall, with white or ivory flowers clustered into a spike arrangement at the top of the stem. Ute ladies'-tresses typically blooms from late July through August. However, it may bloom in early July or still be in flower as late as early October, depending on location and climatic conditions. Ute ladies'-tresses is endemic to moist soils near wetland meadows, springs, lakes, and perennial streams where it colonizes early successional point bars or sandy edges. The elevation range of known occurrences is 4,200 to 7,000 feet (although no known populations in Wyoming occur above 5,500 feet). Soils where Ute ladies'-tresses have been found typically range from fine silt/sand, to gravels and cobbles, as well as to highly organic and peaty soil types. Ute ladies'-tresses is not found in heavy or tight clay soils or in extremely saline or alkaline soils. Ute ladies'-tresses typically occurs in small, scattered groups found primarily in areas where vegetation is relatively open.

Many orchid species take 5 to 10 years to reach reproductive maturity; this appears to be true for Ute ladies'-tresses (FR 57 2048). Furthermore, reproductively mature plants do not flower every year. For these reasons, 2 to 3 years of surveys are necessary to determine presence or absence

of Ute ladies'-tresses. Surveys should be conducted by knowledgeable botanists trained in conducting rare plant surveys.

Yellow-billed Cuckoo (Western Distinct Population Segment): The distinct population segment of the yellow-billed cuckoo (*Coccyzus americanus*) west of the Continental Divide is proposed as a threatened species under the ESA (78 FR 61621; October 3, 2013). In Wyoming, the yellow-billed cuckoo is dependent on large areas of woody, riparian vegetation that combine a dense shrubby understory for nesting and a cottonwood overstory for foraging. Destruction, degradation, and fragmentation of wooded, riparian habitats are continuing threats to yellow-billed cuckoos in Wyoming. Additionally, project actions to control outbreaks of caterpillars, cicadas, or grasshoppers and the general use of insecticides in or adjacent to riparian areas may negatively affect yellow-billed cuckoos. Surveys to determine the presence of yellow-billed cuckoos are difficult due to the secretive nature of the species and the variability in the timing of nesting. Therefore, we recommend that projects avoid impacting large, woody riparian areas from late May to September, during the period when yellow-billed cuckoos seasonally occur in Wyoming. To help us better understand the distribution and status of the species in Wyoming, we request that all sightings of yellow-billed cuckoos west of the Continental Divide be reported to our office.

Candidate Species

A candidate species is one for which the Service has sufficient information on their biological status and threats to propose for listing under the ESA, but the development of a proposed listing rule is precluded by other higher priority listing actions. Listing actions are prioritized by the degree or magnitude of threats to the species, the immediacy of the threats, and the taxonomic distinctiveness of the species. Candidates are reviewed annually to determine if they continue to warrant listing or if their status or priority has changed. Conservation measures for candidate species are voluntary, but recommended. Protection provided to these species now may preclude possible listing in the future. We would appreciate receiving information as to the current status of these species in or near the Project area.

Greater Sage-grouse: The greater sage-grouse (*Centrocercus urophasianus*) is a candidate for listing under the Act (75 FR 13910, March 23, 2010). Please see our recent *Federal Register* notice for detailed information concerning the status of the species; this notice is available at http://www.fws.gov/wyominges/Pages/Species/Findings/GrtSageGrouse_CandidateBulletin.html. Greater sage-grouse are dependent on sagebrush habitats year-round. Habitat loss and degradation, as well as loss of population connectivity, have been identified as important factors contributing to the decline of greater sage-grouse populations rangewide. Therefore, any activities that result in loss or degradation of sagebrush habitats that are important to this species should be closely evaluated for their impacts to sage-grouse.

We recommend you contact the Wyoming Game and Fish Department to identify important greater sage-grouse habitats, recommended seasonal restrictions within the Project area, and appropriate measures to minimize potential impacts from the proposed Project. The Service recommends surveys and mapping of important greater sage-grouse habitats where local information is not available. The results of these surveys should be used in Project planning to

minimize potential impacts to this species. No Project activities that may exacerbate habitat loss or degradation should be permitted in important habitats.

The State of Wyoming has adopted a "Greater Sage-grouse Core Area Protection" Executive Order 2011-5 to ensure greater sage-grouse conservation. If a proposed project is located in an area designated by the State of Wyoming as a core sage-grouse population area, we recommend you pursue additional consultation with the Wyoming Game and Fish Department on the core area strategy as appropriate.

Species of Concern

Mountain Plover: On May 12, 2011, the Service announced the decision to withdraw the proposed listing of the mountain plover (*Charadrius montanus*) as a threatened species under the ESA (76 FR 27756). The mountain plover is a migratory, terrestrial shorebird averaging 8 inches (21 centimeters) in body length. Mountain plovers are light brown above and white below, but lack the contrasting band characteristic of other plovers. They feed on invertebrates, primarily beetles, crickets, and ants. Mountain plovers arrive at their breeding grounds in the western Great Plains and Rocky Mountain states in the spring. Southbound migration is prolonged, starting in late June and continuing through October.

We encourage project planners to develop and implement protective measures if mountain plovers, or suitable mountain plover habitat, occur within project areas. Measures to protect the mountain plover from further decline may include: (1) avoidance of suitable habitat during the plover nesting season (April 10 through July 10), (2) prohibition of ground disturbing activities in prairie dog towns, and (3) prohibition of any permanent above ground structures that may provide perches for avian predators or deter plovers from using preferred habitat. Suitable habitat for nesting mountain plovers includes grasslands, mixed grassland areas and short-grass prairie, shrub-steppe, plains, alkali flats, agricultural lands, cultivated lands, sod farms, and prairie dog towns.

Pygmy Rabbit: The pygmy rabbit (*Brachylagus idahoensis*) is the smallest member of the Leporidae (rabbit) family and it occurs in portions of many western states including southwestern Wyoming. Pygmy rabbits are sagebrush obligate species that are primarily found in areas with deep soils that support dense big sagebrush (*Artemisia tridentata*) communities, often where other species of sagebrush and forbs occur as well. Conversion of sagebrush grasslands, habitat fragmentation, fire, invasive plants, and overgrazing are considered potential threats to pygmy rabbits. We encourage planners to analyze project areas for potential effects to pygmy rabbits and their habitats. Project planning measures that retain large tracts of suitable habitat and corridors to adjacent habitat will aid in the conservation of this species.

For our internal tracking purposes, we would appreciate notification of any decision made on this Project (such as issuance of a permit or signing of a Record of Decision or Decision Memo). Notification can be sent in writing to the letterhead address or by electronic mail to FW6_Federal_Activities_Cheyenne@fws.gov.

We appreciate your efforts to ensure the conservation of endangered, threatened, and candidate species and migratory birds. If you have questions regarding this letter or your responsibilities under the ESA and/or other authorities or resources described above, please contact Nathan Darnall of my office at the letterhead address or phone (307) 772-2374, extension 246.

Sincerely,

For / R. Mark Sattelberg
Field Supervisor
Wyoming Field Office

Enclosure – Raptor Guidelines

cc: BLM, Endangered Species Program Lead, Cheyenne, WY (C. Keefe) (ckeefe@blm.gov)
FWS, Project Planning Coordinator, Region 6, Denver, CO (maria_boroja@fws.gov)
WGFD, Non-game Coordinator, Lander, WY (B. Oakleaf)
WGFD, Statewide Habitat Protection Coordinator, Cheyenne, WY (M. Flanderka)

U.S. Fish and Wildlife Service, Wyoming Ecological Services Field Office

Protections for Raptors

Raptors, or birds of prey, and the majority of other birds in the United States are protected by the Migratory Bird Treaty Act, 16 U.S.C. 703 (MBTA). A complete list of migratory bird species can be found in the Code of Federal Regulations at 50 CFR 10.13. Eagles are also protected by the Bald and Golden Eagle Protection Act, 16 U.S.C. 668 (Eagle Act).

The MBTA protects migratory birds, eggs and nests from possession, sale, purchase, barter, transport, import, export, and take. The regulatory definition of take, defined in 50 CFR 10.12, means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to hunt, shoot, wound, kill, trap, capture, or collect a migratory bird. Activities that result in the unpermitted take (e.g., result in death, possession, collection, or wounding) of migratory birds or their eggs are illegal and fully prosecutable under the MBTA. Removal or destruction of active nests (i.e., nests that contain eggs or young), or causing abandonment of an active nest, could constitute a violation of the MBTA, the Eagle Act, or both statutes. Removal of any active migratory bird nest or any structure that contains an active nest (e.g., tree) where such removal results in take is prohibited. Therefore, if nesting migratory birds are present on or near a project area, project timing is an important consideration during project planning. As discussed below, the Eagle Act provides additional protections for bald and golden eagles and their nests. For additional information concerning nests and protections under the MBTA, please see the U.S. Fish and Wildlife Service's (Service) Migratory Bird Permit Memorandum, MBMP-2.

The Service's Wyoming Ecological Services Field Office works to raise public awareness about the possible occurrence of birds in proposed project areas and the risk of violating the MBTA, while also providing guidance to minimize the likelihood that take will occur. We encourage you to coordinate with our office before conducting actions that could lead to the take of a migratory bird, their young, eggs, or active nests (e.g., construction or other activity in the vicinity of a nest that could result in a take). If nest manipulation is proposed for a project in Wyoming, the project proponent should also contact the Service's Migratory Bird Office in Denver at 303-236-8171 to see if a permit can be issued. Permits generally are not issued for an active nest of any migratory bird species, unless removal of the nest is necessary for human health and safety. If a permit cannot be issued, the project may need to be modified to ensure take of migratory birds, their young or eggs will not occur.

For infrastructure (or facilities) that have potential to cause direct avian mortality (e.g., wind turbines, guyed towers, airports, wastewater disposal facilities, transmission lines), we recommend locating structures away from high avian-use areas such as those used for nesting, foraging, roosting or migrating, and the travel zones between high-use areas. If the wildlife survey data available for the proposed project area and vicinity do not provide the detail needed to identify normal bird habitat use and movements, we recommend collecting that information prior to determining locations for any infrastructure that may create an increased potential for avian mortalities. We also recommend contacting the Service's Wyoming Ecological Services office for project-specific recommendations.

Additional Protections for Eagles

The Eagle Act protections include provisions not included in the MBTA, such as the protection of unoccupied nests and a prohibition on disturbing eagles. Specifically, the Eagle Act prohibits knowingly taking, or taking with wanton disregard for the consequences of an activity, any bald or golden eagle or their body parts, nests, chicks or eggs, which includes collection, possession, molestation, disturbance, or killing. The term "disturb" is defined as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior" (50 CFR 22.3 and see also 72 FR 31132).

The Eagle Act includes limited exceptions to its prohibitions through a permitting process. The Service has issued regulations concerning the permit procedures for exceptions to the Eagle Act's prohibitions (74 FR 46836), including permits to take golden eagle nests which interfere with resource development or recovery operations (50 CFR 22.25). The regulations identify the conditions under which a permit may be issued (i.e., status of eagles, need for action), application requirements, and other issues (e.g., mitigation, monitoring) necessary in order for a permit to be issued.

For additional recommendations specific to Bald Eagles please see our Bald Eagle information web page (http://www.fws.gov/wyominges/Pages/Species/Species_SpeciesConcern/BaldEagle.html).

Recommended Steps for Addressing Raptors in Project Planning

Using the following steps in early project planning, agencies and proponents can more easily minimize impacts to raptors, streamline planning and permitting processes, and incorporate measures into an adaptive management program:

1. Coordinate with appropriate Service offices, Wyoming Game and Fish Department, Tribal governments, and land-management agencies at the earliest stage of project planning.
2. Identify species and distribution of raptors occurring within the project area by searching existing data sources (e.g., Wyoming Game and Fish Department, Federal land-management agencies) and by conducting on-site surveys.
3. Plan and schedule short-term and long-term project disturbances and human-related activities to avoid raptor nesting and roosting areas, particularly during crucial breeding and wintering periods
4. Determine location and distribution of important raptor habitat, nests, roost sites, migration zones and, if feasible, available prey base in the project impact area.
5. Document the type, extent, timing, and duration of raptor activity in important use areas to establish a baseline of raptor activity.
6. Ascertain the type, extent, timing, and duration of development or human activities proposed to occur, and the extent to which this differs from baseline conditions.
7. Consider cumulative effects to raptors from proposed projects when added to past, present, and reasonably foreseeable actions. Ensure that project mitigation adequately addresses cumulative effects to raptors.
8. Minimize loss of raptor habitats and avoid long-term habitat degradation. Mitigate for unavoidable losses of high-valued raptor habitats, including (but not limited to) nesting, roosting, migration, and foraging areas.
9. Monitor and document the status of raptor populations and, if feasible, their prey base post project completion, and evaluate the success of mitigation efforts.
10. Document meaningful data and evaluations in a format that can be readily shared and incorporated into wildlife databases (contact the Service's Wyoming Ecological Services office for details).

Protection of nesting, wintering (including communal roost sites), and foraging activities is considered essential to conserving raptors. In order to promote the conservation of migratory bird populations and their habitats, Federal agencies should implement those strategies directed by Executive Order 13186, "Responsibilities of Federal Agencies To Protect Migratory Birds" (66 FR 3853).

Recommended Seasonal and Spatial Buffers to Protect Nesting Raptors

Because many raptors are particularly sensitive to disturbance (that may result in take) during the breeding season, we recommend implementing spatial and seasonal buffer zones to protect individual nest sites/territories (Table 1). The buffers serve to minimize visual and auditory impacts associated with human activities near nest sites. Ideally, buffers would be large enough to protect existing nest trees and provide for alternative or

replacement nest trees. The size and shape of effective buffers vary depending on the topography and other ecological characteristics surrounding the nest site. In open areas where there is little or no forested or topographical separation, distance alone must serve as the buffer. Adequate nesting buffers will help ensure activities do not take breeding birds, their young or eggs. For optimal conservation benefit, we recommend that no temporary or permanent surface occupancy occur within species-specific spatial buffer zones. For some activities with very substantial auditory impacts (e.g., seismic exploration and blasting) or visual impacts (e.g., tall drilling rig), a larger buffer than listed in Table 1 may be necessary, please contact the Service's Wyoming Ecological Services office for project specific recommendations on adequate buffers.

As discussed above, for infrastructure that may create an increased potential for raptor mortalities, the spatial buffers listed in Table 1 may not be sufficient to reduce the incidence of raptor mortalities (for example, if a wind turbine is placed outside a nest disturbance buffer, but inadvertently still within areas of normal daily or migratory bird movements); therefore, please contact the Service's Wyoming Ecological Services office for project specific recommendations on adequate buffers.

Buffer recommendations may be modified on a site-specific or project-specific basis based on field observations and local conditions. The sensitivity of raptors to disturbance may be dependent on local topography, density of vegetation, and intensity of activities. Additionally, individual birds may be habituated to varying levels of disturbance and human-induced impacts. Modification of protective buffer recommendations may be considered where biologically supported and developed in coordination with the Service's Wyoming Ecological Services Field Office.

Because raptor nests are often initially not identified to species (e.g., preliminary aerial surveys in winter), we first recommend a generic raptor nest seasonal buffer guideline of January 15th – August 15th. Similarly, for spatial nesting buffers, until the nesting species has been confirmed, we recommend applying a 1-mile spatial buffer around the nest. Once the raptor species is confirmed, we then make species-specific and site-specific recommendations on seasonal and spatial buffers (Table 1).

Activities should not occur within the spatial/seasonal buffer of any nest (occupied or unoccupied) when raptors are in the process of courtship and nest site selection. Long-term land-use activities and human-use activities should not occur within the species-specific spatial buffer of occupied nests. Short-term land use and human-use activities proposed to occur within the spatial buffer of an occupied nest should only proceed during the seasonal buffer after coordination with the Service, State, and Tribal wildlife resources management agencies, and/or land-management agency biologists. If, after coordination, it is determined that due to human or environmental safety or otherwise unavoidable factors, activities require temporary incursions within the spatial and seasonal buffers, those activities should be planned to minimize impacts and monitored to determine whether impacts to birds occurred. Mitigation for habitat loss or degradation should be identified and planned in coordination with applicable agencies.

Please contact the Service's Wyoming Ecological Services Field Office if you have any questions regarding the status of the bald eagle, permit requirements, or if you require technical assistance regarding the MBTA, Eagle Act, or the above recommendations. The recommended spatial and seasonal buffers are voluntary (unless made a condition of permit or license) and are not regulatory, and they do not supersede provisions of the MBTA, Eagle Act, Migratory Bird Permit Memorandum (MBMP-2), and Endangered Species Act. Assessing legal compliance with the MBTA or the Eagle Act and the implementing regulations is ultimately the authority and responsibility of the Service's law enforcement personnel. Our recommendations also do not supersede Federal, State, local, or Tribal regulations or permit conditions that may be more restrictive.

Table 1. Service's Wyoming Ecological Services Field Office's Recommended Spatial and Seasonal Buffers for Breeding Raptors

Raptors of Conservation Concern (see below for more information)

Common Name	Spatial buffer (miles)	Seasonal buffer
Golden Eagle	0.50	January 15 - July 31
Ferruginous Hawk	1.00	March 15 - July 31
Swainson's Hawk	0.25	April 1 - August 31
Bald Eagle	see Bald Eagle information web page[1]	
Prairie Falcon	0.50	March 1 - August 15
Peregrine Falcon	0.50	March 1 - August 15
Short-eared Owl	0.25	March15- August 1
Burrowing Owl	0.25	April 1 – September 15
Northern Goshawk	0.50	April 1 - August 15

Additional Wyoming Raptors

Common Name	Spatial buffer (miles)	Seasonal buffer
Osprey	0.25	April 1 - August 31
Cooper's Hawk	0.25	March 15 – August 31
Sharp-shinned Hawk	0.25	March 15 – August 31
Red-tailed Hawk	0.25	February 1 – August 15
Rough-legged Hawk (winter resident only)	----	----
Northern Harrier	0.25	April 1 - August 15
Merlin	0.50	April 1 - August 15
American Kestrel	0.125	April 1 – August 15
Common Barn Owl	0.125	February 1 – September 15
Northern Saw-whet Owl	0.25	March 1 - August 31
Boreal Owl	0.25	February 1 – July 31
Long-eared Owl	0.25	February 1 – August 15
Great Horned Owl	0.125	December 1 – September 30
Northern Pygmy-Owl	0.25	April 1 – August 1
Eastern Screech -owl	0.125	March 1 – August 15
Western Screech-owl	0.125	March 1 – August 15
Great Gray Owl	0.25	March 15 – August 31

[1] http://www.fws.gov/wyominges/Pages/Species/Species_SpeciesConcern/BaldEagle.html

Raptors of Conservation Concern

The Service's Birds of Conservation Concern (2008) report identifies "species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing" under the Endangered Species Act (16 U.S.C 1531 et seq.). This report is intended to stimulate coordinated and proactive conservation actions among Federal, State, and private partners. The Wyoming Partners in Flight Wyoming Bird Conservation Plan identifies priority bird species and habitats, and establishes objectives for bird populations and habitats in Wyoming. This plan also recommends conservation actions to accomplish the population and habitat objectives.

We encourage project planners to develop and implement protective measures for the Birds of Conservation Concern as well as other high-priority species identified in the Wyoming Bird Conservation Plan. For

additional information on the Birds of Conservation Concern that occur in Wyoming, please see our Birds of Conservation Concern web page.

Additional Planning Resources

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APPENDIX D

CULTURAL RESOURCE REPLY LETTER

ARTS. PARKS. HISTORY.
Wyoming State Parks & Cultural Resources

State Historic Preservation Office
2301 Central Ave., Barrett Bldg. 3rd Floor
Cheyenne, WY 82002
307-777-7697
FAX: 307-777-6421
http://wyoshpo.state.wy.us

February 10, 2014

Ryan Erickson, P.E.
Project Engineer
Sunrise Engineering, Inc.
P.O. Box 609
Afton, WY 83110

Re: Austin Canal Replacement Project, Unita County, WY (SHPO File # 0214ECK001)

Dear Mr. Erickson:

Thank you for consulting with the Wyoming State Historic Preservation Office (SHPO) regarding the above referenced undertaking. We have reviewed the associated report and find the documentation meets the Secretary of the Interior's Standards for Archaeology and Historic Preservation (48 FR 44716-42). We concur with your finding that no historic properties, as defined in 36 CFR § 800.16(l)(1), will be affected by the undertaking as planned.

We recommend Sunrise Engineering allow the undertaking to proceed in accordance with state and federal laws subject to the following stipulation:

> If any cultural materials are discovered during construction, work in the area shall halt immediately, the federal agency must be contacted, and the materials evaluated by an archaeologist or historian meeting the Secretary of the Interior's Professional Qualification Standards (48 FR 22716, Sept. 1983).

This letter should be retained in your files as documentation of a SHPO concurrence on your finding of no historic properties affected. Please refer to SHPO project #0214ECK001 on any future correspondence regarding this undertaking. If you have any questions, please contact Beth King at 307-777-6179.

Sincerely,

Elizabeth C. King

Elizabeth C. King
Historic Preservation Specialist

ARTS. PARKS. HISTORY.
Wyoming State Parks & Cultural Resources

State Historic Preservation Office
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2301 Central Avenue
Cheyenne, WY 82002
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Aug 12, 2015

Wayne G Pullan
Bureau of Reclamation
Upper Colorado Region
Provo Area Office
302 East 1860 South
Provo, UT 84606-7317

Re: Class III Cultural Resource Inventory Austin Canal Rehabilitation Project. (SHPO File # 0815JRD007)

Dear Mr. Pullan:

Thank you for consulting with the Wyoming State Historic Preservation Office (SHPO) regarding the above referenced undertaking. We have reviewed the associated report and find the documentation meets the Secretary of the Interior's Standards for Archaeology and Historic Preservation (48 FR 44716-42). We concur with your finding that sites 48UT1582 and 48UT1645/1735 are not eligible for listing in the National Register of Historic Places and the undertaking will not affect any historic properties.

We recommend the Bureau of Reclamation allow the undertaking to proceed in accordance with state and federal laws subject to the following stipulation:

> If any cultural materials are discovered during construction, work in the area shall halt immediately, the federal agency and SHPO staff be contacted, and the materials be evaluated by an archaeologist or historian meeting the Secretary of the Interior's Professional Qualification Standards (48 FR 22716, Sept. 1983).

This letter should be retained in your files as documentation of a SHPO concurrence with your finding of no historic properties affected. Please refer to SHPO project #0815JRD007 on any future correspondence regarding this undertaking. If you have any questions, please contact Joseph Daniele, Archaeologist/Review and Federal Consultation at 307-777-8793.

Sincerely,

Joseph Daniele
Wyoming State Historic Preservation Office

APPENDIX E

PALEONTOLOGICAL REPORT

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December 3, 2013

Ryan Erickson, Project Engineer
Sunset Engineering
47 East 4th Avenue
Afton, Wyoming 83110

RE: Analysis of Existing Paleontological Data: Austin Canal Replacement Project, Uinta County, Wyoming

Mr. Erickson,

Sunrise Engineering proposes to replace the existing, open Austin Canal with a buried pipeline for a length of approximately 6 miles. At the request of Sunrise Engineering, SWCA Environmental Consultants (SWCA) completed a paleontological existing data analysis for the Austin Canal Replacement project (Project). The Project is in Sections 1, 2, 4, 5, 6, 33, 35 of Township 16 North – Township 17 North, Range 114 West–Range 115 West, in Uinta County, Wyoming, within the jurisdiction of the Kemmerer Field Office of the Bureau of Land Management (BLM). The Project lies mostly on Bureau of Reclamation (BOR) lands with a small portion on BLM lands.

The objective of this review was to gather and analyze existing data to determine the paleontology of the Project area and to make mitigation recommendations as appropriate. The scope of this analysis, which was conducted according to BLM paleontological resource management procedural guidelines (BLM Instructional Memoranda 2008-009 and 2009-11), included a literature review, a geologic map review, and a museum records search.

Literature Review

The Project area is mapped as being entirely underlain by one bedrock geologic unit—informal subdivision A of the middle Eocene Bridger Formation (Dover and McGonigle, 1993)—which is locally mantled by Quaternary surficial sedimentary deposits. The following summary of the geology and paleontology of the Bridger Formation is excerpted and summarized from Murphey and Evanoff (2011) and Murphey et al. (2011).

The Bridger Formation was named the Bridger Group by Hayden (1869). The first stratigraphic framework for the Bridger Formation was established by W.D. Matthew (1909) of the American Museum of Natural History in the southern Green River Basin where the formation is thickest and best exposed. Matthew's (1909) stratigraphic subdivisions of the Bridger Formation were based primarily on five aerially extensive limestone beds. He named these the Cottonwood, Sage Creek, Burnt Fork, Lonetree, and upper white layers, and some were used to subdivide the formation into five units: Bridger A, B, C,

D, and E, from lowest to highest. Matthew's intent was to make it possible to stratigraphically locate the numerous known fossil localities in the formation. Because they are the most fossiliferous, the Bridger B, C, and D were further divided into five subunits corresponding to basal, lower, middle, upper, and top levels (e.g., B1, B2, B3, B4, and B5). Because Matthew did not define the upper and lower boundaries of these subunits with stratigraphic markers or measured sections, correlations between them and the later subdivisions proposed by Evanoff et al. (1998), Murphey (2001), and Murphey and Evanoff (2007) are uncertain.

The Bridger Formation has been subdivided into three members: 1) the Blacks Fork Member, or lower Bridger, is equivalent to Matthew's Bridger A and B; 2) the Twin Buttes Member, or upper Bridger, is equivalent to Matthew's C and D; and 3) the Turtle Bluff Member, also considered part of the upper Bridger, is equivalent to Matthew's Bridger E. A detailed history of geologic and paleontologic investigations focusing on the Bridger Formation, and the history of stratigraphic nomenclature for this unit is provided by Murphey and Evanoff (2007). Evanoff et al. (1998), Murphey (2001), and Murphey and Evanoff (2007) published the first major stratigraphic revision of the Bridger Formation since Matthew's (1909) stratigraphy. The most recent stratigraphic subdivisions are based on widespread limestone beds, tuffs, and tuffaceous sheet sandstones, which are used as marker units. Fifteen such units were described, and seven of these were considered major markers. These were used to subdivide the Bridger C and D (Twin Buttes Member) into lower, middle, and upper informal subdivisions. Two additional markers were used to redefine the base and define the top of the Bridger E (Turtle Bluff Member). Four of Matthew's original "white layers" were included in the stratigraphy of the Bridger C and D, and these were mapped and re-described in detail. In conjunction with the latest stratigraphic revision, geologic mapping of ten 7.5-minute quadrangles that cover the area encompassed by the upper Bridger Formation was completed, and these maps are available from the Wyoming State Geological Survey. Because many marker units are not continuously exposed or traceable across the entire basin (from Hickey Mountain, Sage Creek Mountain, and Cedar Mountain east to Twin Buttes and Black Mountain), covering a distance of approximately 40 miles, accurate correlation was made possible by using the mineralogically diagnostic Henrys Fork Tuff as a datum.

Rock accumulation rates, isotopic ages of ash-fall tuffs (Murphey et al. 1999), and fossils indicate that the 842-meter-thick (2,763-foot-thick) Bridger Formation was deposited over an approximately 3.5-million-year interval from approximately 49.09 to 45.57 million years ago (Ma), and that the faunal transition from the Bridgerian to the Uintan Land Mammal Age was underway by approximately 46 Ma, as indicated by fossils collected from the Turtle Bluff Member (Evanoff et al. 1994; Gunnell et al. 2009; Murphey 2001; Murphey and Evanoff 2007; Robinson et al. 2004). Recognized depositional environments of the Bridger Formation include fluvial, lacustrine, playa lacustrine, paludal, marginal mudflat, basin margin, and volcanic. Murphey and Evanoff (2007) concluded that an influx of fluvially transported volcaniclastic sediment to the Green River Basin during middle Eocene time led to the filling of Lake Gosiute and the development of muddy floodplains of low topographic relief, which persisted for up to 85% of the time during which the upper Bridger was deposited. Occasional lapses in the flow of sediment to the basin permitted the development of shallow, mostly groundwater-fed lakes and ponds, which accumulated up to four times as slowly as floodplain deposits. These lapses decreased in frequency throughout deposition of the upper Bridger Formation. As indicated by fossil distribution and diversity, lakes and their margins provided favorable habitats for both aquatic and terrestrial organisms during deposition of the Bridger Formation.

One of the world's most abundant and diverse middle Eocene vertebrate faunas is preserved in the Bridger Formation. More than 86 species representing 67 genera, 30 families, and 13 orders of fossil mammals are recognized (Gazin 1976). Joseph Leidy's 1869 description of *Omomys carteri* was the first scientific description of a fossil from the Bridger Formation. Subsequently, Bridger fossils have been the subject of numerous publications, including many classic papers by pioneers of American vertebrate

paleontology (Cope 1872, 1873; Leidy 1869, 1871, 1872; Marsh 1871, 1886; Matthew 1909; Osborn 1929). Like many other highly fossiliferous formations, the Bridger contains an abundance and diversity of fossils that make it well suited for paleontological research, most of which has focused on the phylogenetics, systematic paleontology, and biostratigraphy of the vertebrate fauna (Evanoff et al. 1994; Gazin 1957, 1958, 1965, 1968, 1976; Gunnell et al. 2009; Krishtalka et al. 1987; McGrew and Sullivan 1970; Robinson et al. 2004; West and Hutchison 1981). Preserved in a variety of sedimentary environments, preservational states, associations, and in locally varying abundances, these fossils include primarily vertebrates and mollusks, with less common plants and ichnofossils. Plant fossils include leaves, seeds, and wood, the latter of which is sometimes covered in algae (see Murphey et al. 2001). Ichnofossils include solitary bee cases, earthworm pellets, caddisfly larvae, and fish pellets. Vertebrate fossils include fish, amphibians, reptiles (lizards, snakes, turtles, and crocodilians), a diversity of birds (see Murphey et al. 2001), and mammals. Mammalian fossils include apatotheres, artiodactyls, chiropterans, carnivores, condylarths, dermopterans, dinoceratans (uintatheres), edentates, insectivores, leptictids, marsupials, pantolestids, perissodactyls, primates, rodents, taeniodonts, and tillodonts (Gazin 1976; unpublished paleontological data, University of Colorado Museum, compiled in 2002). Despite the relative ease with which diverse and statistically significant fossil samples can be collected, and the large historical collections of Bridger vertebrates available in many museums, taphonomic and paleoecologic studies of Bridger vertebrate faunas are relatively few (Alexander and Burger 2001; Brand et al. 2000; Gunnell 1997; Gunnell and Bartels 1994; Murphey et al. 2001; Murphey and Townsend 2005; Townsend 2004).

Over the last 20 years, stratigraphically documented fossil collections made by workers from the University of Colorado Museum, Denver Museum of Nature and Science, University of Michigan Museum of Paleontology, and more recently by the San Diego Natural History Museum have added significantly to existing biostratigraphic knowledge of the Bridger Formation. These collections, together with precise provenance data, have made it possible to define formal biochronologic units for the Bridgerian North American Land Mammal Age (NALMA), most of which are based on stratotype sections that are located in the Bridger Formation. Gunnell et al. (2009) have divided the Bridgerian into four "biochrons." Formerly referred to as Gardnerbuttean land mammal sub-age, or Br0, biochron Br1a is the only Bridgerian biochron not found in the Bridger Formation. Its stratotype section is the *Eotitanops borealis* interval zone of the Davis Ranch section of the Wind River Formation. Biochron Br1b is equivalent to the lower Blacksforkian, and its stratotype spans the Bridger A (lower part of the Blacks Fork Member). Biochron Br2 is equivalent to the upper Blacksforkian, and its stratotype section spans the Bridger B (upper part of the Blacks Fork Member). Biochron Br3 is equivalent to the Twinbuttean, and its stratotype section spans the entire Bridger C and D (Twin Buttes Member). The uppermost member of the Bridger Formation, the Turtle Bluff Member (or Bridger E), is the stratotype section for the earliest Uintan biochron, Ui1a (Gunnell et al. 2009; Walsh and Murphey 2007). In summary, the mammalian fauna of the Bridger Formation has been used to formally define biochrons Br1b, Br2, Br3, and Ui1a.

The fossil assemblages of the Bridger Formation and other Eocene rock units in the greater Green River Basin provide an unprecedented opportunity to study ancient communities and environments. Studies of these fossils and the rocks in which they are preserved are the source of much of our knowledge of the Eocene Epoch of North America. The vertebrate faunas are of particular scientific importance because they represent an exceptional record of early Tertiary mammalian evolution and diversification spanning the Wasatchian, Bridgerian, and earliest Uintan NALMAs. The Bridger Formation contains locally abundant and well-preserved vertebrate and invertebrate (mollusk) fossils, and less common but scientifically important plant fossils. All members of the Bridger Formation are designated by the BLM as Potential Fossil Yield Classification (PFYC) Class 5.

Geologic Map Review

Based on published geologic mapping (Dover and McGonigle 1993), the Project area (Figure 1) contains one bedrock geologic unit: informal subdivision A of the middle Eocene-age Bridger Formation. In the Project area, the Bridger Formation is locally mantled by thin surficial sedimentary deposits of Quaternary alluvium. The BLM has ranked the Bridger Formation a PFYC system Class 5, meaning it has very high potential to yield fossils with scientific significance.

Museum Record Search

The Denver Museum of Nature and Science and the University of Colorado Museum have a long history of scientific fossil collecting and research in the Bridger Formation. Neither institution has any previously recorded fossil localities within 3 miles of the Project area.

Paleontological Resource Impacts

In general, surface-disturbing actions have the potential to result in adverse impacts to surface and subsurface paleontological resources in rock units and to overlying sediments known to contain such resources. Direct impacts include destruction due to breakage and crushing as the result of surface and subsurface disturbance. Indirect impacts typically include those effects that result from the continuing implementation of management decisions and resulting activities, including normal ongoing operations of facilities within a given project area. They also occur as the result of the construction of new roads and trails in areas that were previously less accessible. This increases public access and therefore increases the likelihood of the loss of paleontological resources through vandalism and unlawful collecting. Cumulative impacts are incremental effects and constitute the long-term loss to society, as a whole, of the scientific information that would have been available if surface-disturbing actions near the Project area had not taken place.

Based on the very high paleontological potential of the Project area, it is anticipated that the BLM KFO and the BOR will require both 1) a pedestrian survey prior to Project construction and 2) monitoring during construction if previously undisturbed bedrock will be impacted. In addition to any BLM and BOR pre-construction requirements, it is recommended that construction personnel be informed about the paleontological sensitivity of the Project area and instructed that if any mineralized bones or other potentially significant fossils are discovered by Project personnel during construction activities, and a paleontologist is not present, the fossils should be left in place untouched, and the environmental inspector or construction foreman, the BOR or BLM (depending on discovery location), and a qualified and permitted paleontologist should be contacted immediately to evaluate the discovery and make further recommendations.

Please do not hesitate to contact us if you have any questions.

Best regards,

Vicki L. Meyers
Paleontologist Specialist
vmeyers@swca.com

Paul C. Murphey, Ph.D.
Paleontology Principal Investigator
pmurphey@swca.com

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Map 1. Geology along the proposed Austin Canal Replacement Pipeline.

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Paleontological Survey Report for the Austin Canal Replacement Pipeline Project, Uinta County, Wyoming

Prepared for

Sunrise Engineering

and

Bureau of Land Management and Bureau of Reclamation

Prepared by

SWCA Environmental Consultants

August 2014

Paleontological Survey Report for the Austin Canal Replacement Pipeline Project, Uinta County, Wyoming

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SWCA Paleontological Report No. WY14-27773-06

August 10, 2014

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A Fossil Locality Summary and Forms for Newly Recorded Fossil Localities (Confidential: For Agency Only)

1.0 INTRODUCTION

This report presents the results of the paleontological field survey completed by SWCA Environmental Consultants (SWCA) for the Austin Canal Replacement Pipeline Project (Project) at the request of the Bureau of Reclamation (BOR; Provo Area Office), Bureau of Land Management's (BLM's) Kemmerer Field Office (KFO) and Sunrise Engineering. The Project is located on Private lands in Section 1, Township 16 North, Range 115 West; Sections 6 and 5, Township 16 North, Range 114 West; Sections 31, 33, and 34, Township 17 North, Range 114 West; and on BLM-administered lands in Section 2, Township 16 North, Range 115 West, in Uinta County, Wyoming (Figures 1 and 2).

The objective of the field survey completed for the Project was to provide surface paleontological clearance through a pedestrian examination of geologic outcrops in the Project area. The survey area consisted of a 200-foot-wide corridor for all linear features (200 feet on each side of the centerline) (Figures 1 and 2). According to geological mapping (Dover and McGonigle 1993), the Project corridor is underlain by one bedrock geologic unit—informal subdivision A of the middle Eocene-age Bridger Formation (including two individually mapped limestone units – 2 and 3), which has very high potential for scientifically significant paleontological resources [Potential Fossil Yield (PFY) Class 5]. Locally, much of the area is mantled by Quaternary surficial sedimentary deposits.

2.0 DEFINITION OF PALEONTOLOGICAL RESOURCES

Paleontology is a multidisciplinary science that combines elements of geology, biology, chemistry, and physics in an effort to understand the history of life on earth. Paleontological resources, or fossils, are the remains, imprints, or traces of once-living organisms preserved in rocks and sediments. These include mineralized, partially mineralized, or un-mineralized bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains. Paleontological resources include not only fossils themselves, but also the associated rocks or organic matter and the physical characteristics of the fossils' associated sedimentary matrix.

The fossil record is the only evidence that life on earth has existed for more than 3.6 billion years. Fossils are considered non-renewable resources because the organisms they represent no longer exist. Thus, once destroyed, a fossil can never be replaced (Murphey and Daitch 2007). Fossils are important scientific and educational resources and can be used to:

- study the phylogenetic relationships amongst extinct organisms, as well as their relationships to modern groups;
- elucidate the taphonomic, behavioral, temporal, and diagenetic pathways responsible for fossil preservation, including the biases inherent in the fossil record;
- reconstruct ancient environments, climate change, and paleoecological relationships;
- provide a measure of relative geologic dating that forms the basis for biochronology and biostratigraphy and serves as an independent and corroborating line of evidence for isotopic dating;
- study the geographic distribution of organisms and tectonic movements of land masses and ocean basins through time;

- study patterns and processes of evolution, extinction, and speciation; and
- identify past and potential future human-caused effects to global environments and climates (Murphey and Daitch 2007).

3.0METHODS

3.1 BUREAU OF LAND MANAGEMENT AUTHORITIES AND STANDARDS

This paleontological analysis was conducted at the request of the BOR and BLM in accordance with their policies. The BLM currently uses the Federal Land Management and Policy Act of 1976 as the legislative authority for its paleontological resource policies. Additionally, the BLM's Instructional Memorandum (IM) 2008-009 (2007), Manual H-8720-1 (BLM 1998), and IM 2009-011 (BLM 2008) provide general procedural guidelines for the management of paleontological resources. Management objectives include locating, evaluating, managing, and protecting paleontological resources as well as ensuring that proposed land-use projects do not inadvertently damage or destroy important paleontological resources.

Implementing regulations for the Paleontological Resources Preservation Subtitle of the Omnibus Public Lands Act of 2009 (PRPA), Title VI, Subtitle D, are currently being developed. Under the PRPA, the Secretaries (Interior and Agriculture) shall manage and protect paleontological resources on federal land using scientific principles and expertise. The PRPA is modeled after the Archaeological Resources Protection Act and incorporates the recommendations of the May 2000 report of the Secretary of the Interior, *Assessment of Fossil Management on Federal and Indian Lands*, regarding future actions to formulate a consistent paleontological resources management framework. With the passage of the PRPA, congress officially defines fossils as paleontological resources and reaffirms that fossils from federal lands are federal property. The PRPA essentially codifies existing policies of the BLM, National Park Service, U.S. Forest Service, BOR, and U.S. Fish and Wildlife Service. The PRPA provides the following.

- Uniform definitions for *paleontological resources* and *casual collecting.*
- Uniform, minimum requirements for paleontological resource-use permit issuance (terms, conditions, and qualifications of applicants).
- Uniform criminal and civil penalties for illegal sale, transport, theft, and vandalism of fossils from federal lands.
- Uniform requirements for curation of federal fossils in approved repositories.

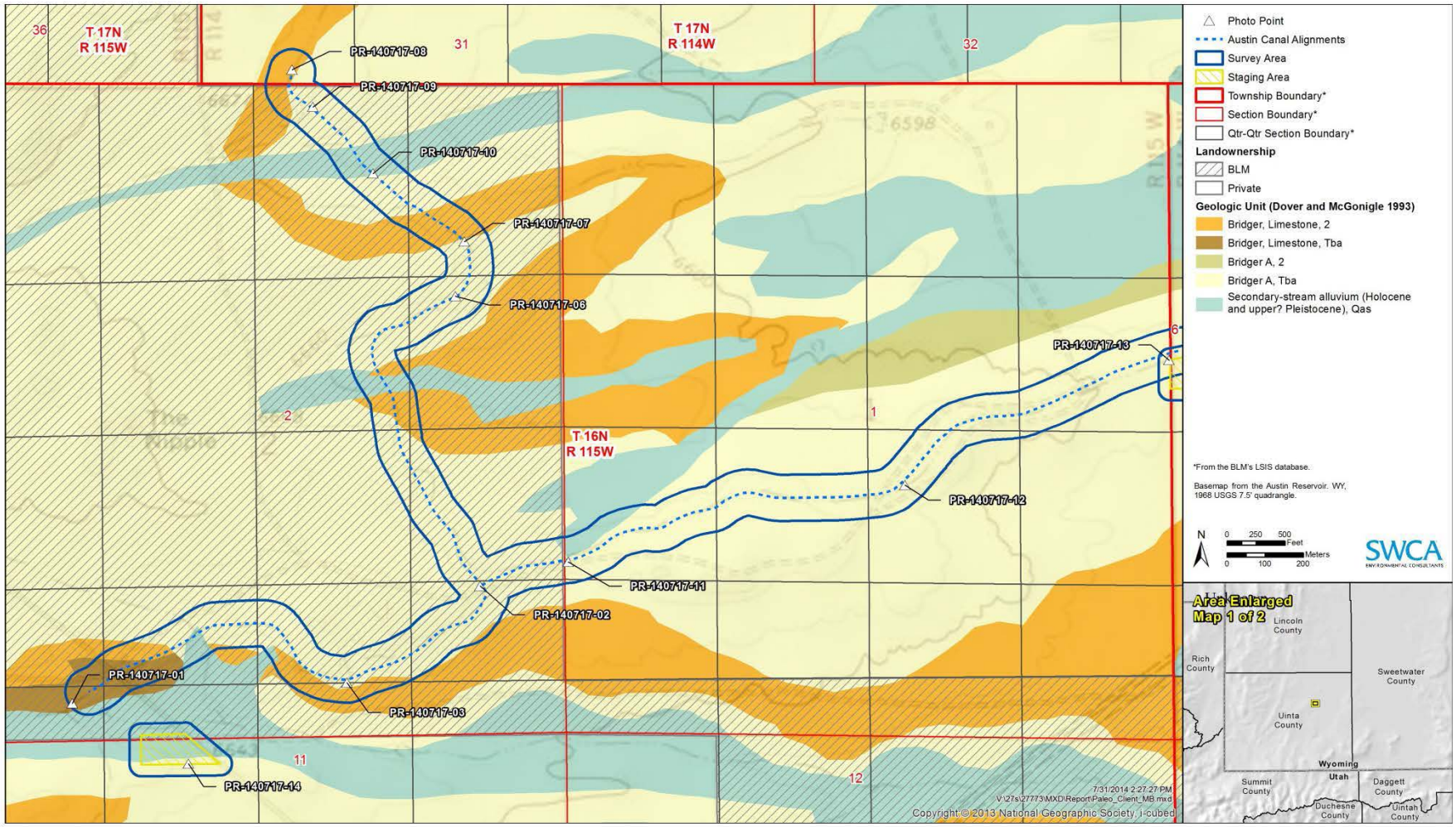

Figure 1. Paleontological survey map for the western portion of the Austin Canal Replacement Pipeline.
Map prepared by Geographic Information System (GIS) Specialist Rachel Johnson.

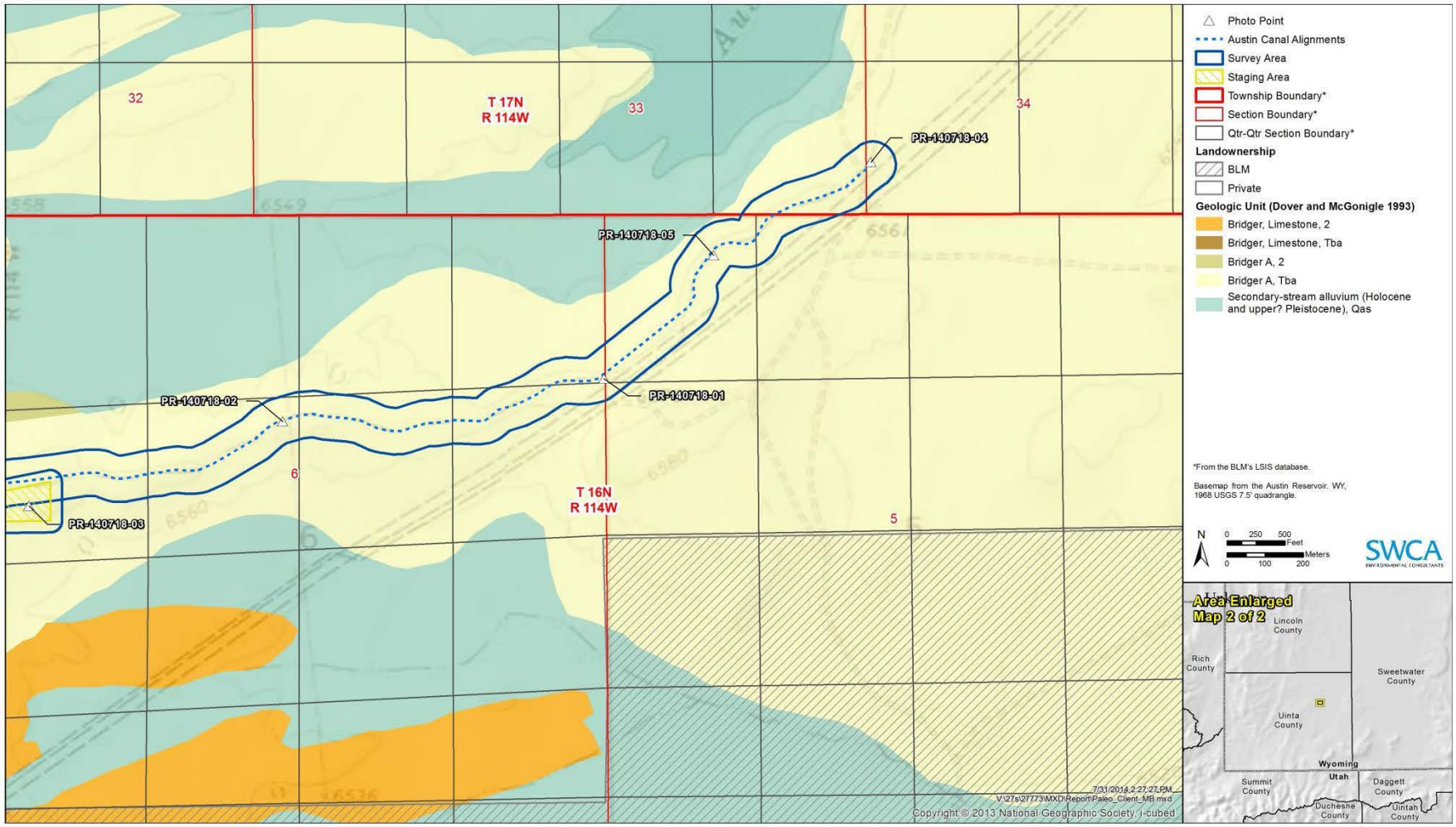

Figure 2. Paleontological survey map for the eastern portion of the Austin Canal Replacement Pipeline.
Map prepared by GIS Specialist Rachel Johnson.

According to the BLM's IM 2009-011 (BLM 2008:1-18 to 1-19), a significant paleontological resource is defined as follows:

> Any paleontological resource that is considered to be of scientific interest, including most vertebrate fossil remains and traces, and certain rare or unusual invertebrate and plant fossils. A significant paleontological resource is considered to be scientifically important because it is a rare or previously unknown species, it is of high quality and well-preserved, it preserves a previously unknown anatomical or other characteristic, provides new information about the history of life on earth, or has identified educational or recreational value. Paleontological resources that may be considered to not have paleontological significance include those that lack provenience or context, lack physical integrity because of decay or natural erosion, or that are overly redundant or are otherwise not useful for research. Vertebrate fossil remains and traces include bone, scales, scutes, skin impressions, burrows, tracks, tail drag marks, vertebrate coprolites (feces), gastroliths (stomach stones), or other physical evidence of past vertebrate life or activities.

3.2 RESOURCE ASSESSMENT METHODS

The paleontological sensitivity of each geologic unit in the Project area was evaluated by the BLM KFO using the PFYC system. This assignment was based on the taxonomic diversity and abundance of previously recorded, scientifically significant fossil occurrences from the geologic unit and the potential for future discoveries. The PFYC system was originally developed by the U.S. Forest Service's Paleontology Center of Excellence and the Region 2 Paleontology Initiative in 1996. Modifications have been made by the BLM's Paleontological Resources staff in subsequent years. The PFYC version used for this analysis was approved as policy by the BLM (2007).

3.3 RECORDS AND LITERATURE SEARCH METHODS

Prior to and during the field survey, the project area was the subject of thorough background research and analysis. The research included geologic map and literature reviews, previous locality data searches, and discussion with paleontologists doing active research in the area. Published scientific literature and paleontological records were searched to 1) determine whether any previously recorded fossil localities occur in the project area, 2) assess the potential for disturbance of these localities during construction, and 3) evaluate the paleontological sensitivity in the project area of potential effects (APE). The paleotnological records search included an examination of unpublished University of Colorado Museum data (UCM compiled 2001), and requests for data from the BLM KFO and Denver Museum of Nature and Science (Ivy 2013)

3.4 FIELD SURVEY METHODS

The survey was designed to 1) determine the surface presence of previously unknown significant vertebrate fossils and/or noteworthy occurrences of invertebrate, plant, or trace fossils; 2) evaluate, if applicable, the condition of previously recorded paleontological localities and the potential for disturbance of these localities during the construction; and 3) evaluate potential adverse impacts to subsurface paleontological resources during construction.

The paleontological assessment covered the APE, which includes a 200-foot-wide corridor along the proposed pipeline. The delineations of the survey areas for the proposed infrastructure locations were provided to SWCA as a CAD file on July 16, 2014, by Sunrise Engineering. The Project APE was inspected for 1) surface fossils, 2) exposures of potentially fossiliferous rock, and 3) areas in which fossiliferous rock would be exposed or otherwise impacted during construction. Exposures of paleontologically sensitive geologic units received a thorough pedestrian survey; and the entire alignment was walked.

It is SWCA's standard operating procedure to record all fossils (i.e., more than four isolated fragments with some potentially diagnostic characters) discovered during field surveys as either significant fossil localities (SFLs) or non-significant fossil occurrences (NFOs). An SFL documents the location, identification, and description of significant paleontological resources along with geologic context. However, the presence of highly weathered, fragmentary, or otherwise unidentifiable fossils is recorded as an NFO in order to communicate the presence of fossils in a manner that will not unnecessarily trigger additional mitigation measures. NFOs typically consist of turtle shell fragments, unidentifiable bone and tooth fragments, and unidentifiable plant fossils and fragments of fossilized wood. Fossil locality data are sensitive and are exempt from the Freedom of Information Act. Therefore, detailed locality information including locality forms are only appended to the agency copies of this report (Appendix A).

3.5 DISTRIBUTION OF DATA

Copies of this report will be submitted to the BOR (Provo Area Office), BLM KFO, BLM State Office, and Sunrise Engineering; an electronic file and relevant field notes, maps, and other data will be retained on SWCA's Vernal office server and on SWCA's corporate server.

4.0 RESULTS

4.1 LITERATURE SEARCH RESULTS

The Project area is located in the Green River Basin in southwestern Wyoming. To the east, the Rock Springs uplift, a north-south-trending anticline, separates the Green River Basin from the Great Divide Basin; the Wind River Range lies to the northeast; the thrust belt to the west; and the east-west-trending Uinta mountains to the south. During and after the formation of these mountain ranges, the basin was filled with continental sediments eroded from these uplifts, which resulted in thick sequences of sedimentary rock. The fossils contained within these units, together with the sediments in which they are preserved, provide evidence of the history of life in the western interior of North America. The Project area is underlain by one geologic formation, the highly paleontologically sensitive Bridger Formation, and the general geology and paleontologic content of this unit is described in this section of the report.

The Bridger Formation was named the Bridger Group by Hayden (1869). The first stratigraphic framework for the Bridger Formation was established by W.D. Matthew (1909) of the American Museum of Natural History in the southern Green River Basin where the formation is thickest and best exposed. Matthew's (1909) stratigraphic subdivisions of the Bridger Formation were based primarily on five aerially extensive limestone beds. He named these the Cottonwood, Sage Creek, Burnt Fork, Lonetree, and upper white layers, and some were used to subdivide the formation into five units: Bridger A, B, C, D, and E, from lowest to highest. Matthew's intent

was to make it possible to stratigraphically locate the numerous known fossil localities in the formation. Because they are the most fossiliferous, the Bridger B, C, and D were further divided into five subunits corresponding to basal, lower, middle, upper, and top levels (e.g., B1, B2, B3, B4, and B5). Because Matthew did not define the upper and lower boundaries of these subunits with stratigraphic markers or measured sections, correlations between them and the later subdivisions proposed by Evanoff et al. (1998), Murphey (2001), and Murphey and Evanoff (2007) are uncertain.

The Bridger Formation has been subdivided into three members: 1) the Blacks Fork Member, or lower Bridger, is equivalent to Matthew's Bridger A and B; 2) the Twin Buttes Member, or upper Bridger, is equivalent to Matthew's C and D; and 3) the Turtle Bluff Member, also considered part of the upper Bridger, is equivalent to Matthew's Bridger E. A detailed history of geologic and paleontologic investigations focusing on the Bridger Formation, and the history of stratigraphic nomenclature for this unit is provided by Murphey and Evanoff (2007). Evanoff et al. (1998), Murphey (2001), and Murphey and Evanoff (2007) published the first major stratigraphic revision of the Bridger Formation since Matthew's (1909) stratigraphy. The most recent stratigraphic subdivisions are based on widespread limestone beds, tuffs, and tuffaceous sheet sandstones, which are used as marker units. Fifteen such units were described, and seven of these were considered major markers. The contact between the Bridger A and Bridger B is at the base of the Lyman limestone (="G" marker bed of McGrew and Sullivan 1970). In addition, these units were used to subdivide the Bridger C and D (Twin Buttes Member) into lower, middle, and upper informal subdivisions. Two additional markers were used to redefine the base and define the top of the Bridger E (Turtle Bluff Member). Four of Matthew's original "white layers" were included in the stratigraphy of the Bridger C and D, and these were mapped and re-described in detail. In conjunction with the latest stratigraphic revision, geologic mapping of ten 7.5-minute quadrangles that cover the area encompassed by the upper Bridger Formation was completed, and these maps are available from the Wyoming State Geological Survey. Because many marker units are not continuously exposed or traceable across the entire basin (from Hickey Mountain, Sage Creek Mountain, and Cedar Mountain east to Twin Buttes and Black Mountain), covering a distance of approximately 40 miles, accurate correlation was made possible by using the mineralogically diagnostic Henrys Fork Tuff as a datum.

Rock accumulation rates, isotopic ages of ash-fall tuffs (Murphey et al. 1999), and fossils indicate that the 842-meter-thick (2,763-foot-thick) Bridger Formation was deposited over an approximately 3.5-million-year interval from approximately 49.09 to 45.57 million years ago (Ma), and that the faunal transition from the Bridgerian to the Uintan Land Mammal Age was underway by approximately 46 Ma, as indicated by fossils collected from the Turtle Bluff Member (Evanoff et al. 1994; Gunnell et al. 2009; Murphey 2001; Murphey and Evanoff 2007; Robinson et al. 2004). Recognized depositional environments of the Bridger Formation include fluvial, lacustrine, playa lacustrine, paludal, marginal mudflat, basin margin, and volcanic. Murphey and Evanoff (2007) concluded that an influx of fluvially transported volcaniclastic sediment to the Green River Basin during middle Eocene time led to the filling of Lake Gosiute and the development of muddy floodplains of low topographic relief, which persisted for up to 85% of the time during which the upper Bridger was deposited. Occasional lapses in the flow of sediment to the basin permitted the development of shallow, mostly groundwater-fed lakes and ponds, which accumulated up to four times as slowly as floodplain deposits. These lapses decreased in frequency throughout deposition of the upper Bridger Formation. As indicated by

fossil distribution and diversity, lakes and their margins provided favorable habitats for both aquatic and terrestrial organisms during deposition of the Bridger Formation.

One of the world's most abundant and diverse middle Eocene vertebrate faunas is preserved in the Bridger Formation. More than 86 species representing 67 genera, 30 families, and 13 orders of fossil mammals are recognized (Gazin 1976). Joseph Leidy's 1869 description of *Omomys carteri* was the first scientific description of a fossil from the Bridger Formation. Subsequently, Bridger fossils have been the subject of numerous publications, including many classic papers by pioneers of American vertebrate paleontology (Cope 1872, 1873; Leidy 1869, 1871, 1872; Marsh 1871, 1886; Matthew 1909; Osborn 1929). Like many other highly fossiliferous formations, the Bridger Formation contains an abundance and diversity of fossils that make it well suited for paleontological research, most of which has focused on the phylogenetics, systematic paleontology, and biostratigraphy of the vertebrate fauna (Evanoff et al. 1994; Gazin 1957, 1958, 1965, 1968, 1976; Gunnell et al. 2009; Krishtalka et al. 1987; McGrew and Sullivan 1970; Robinson et al. 2004; West and Hutchison 1981). Preserved in a variety of sedimentary environments, preservational states, associations, and in locally varying abundances, these fossils include primarily vertebrates and mollusks, with less common plants and ichnofossils. Plant fossils include leaves, seeds, and wood, the latter of which is sometimes covered in algae (see Murphey et al. 2001). Ichnofossils include solitary bee cases, earthworm pellets, caddisfly larvae, and fish pellets. Vertebrate fossils include fish, amphibians, reptiles (lizards, snakes, turtles, and crocodilians), a diversity of birds (see Murphey et al. 2001), and mammals. Mammalian fossils include apatotheres, artiodactyls, chiropterans, carnivores, condylarths, dermopterans, dinoceratans (uintatheres), edentates, insectivores, leptictids, marsupials, pantolestids, perissodactyls, primates, rodents, taeniodonts, and tillodonts (Gazin 1976; unpublished paleontological data, University of Colorado Museum, compiled in 2002). Despite the relative ease with which diverse and statistically significant fossil samples can be collected, and the large historical collections of Bridger vertebrates available in many museums, there are relatively few taphonomic and paleoecologic studies of Bridger vertebrate faunas (Alexander and Burger 2001; Brand et al. 2000; Gunnell 1997; Gunnell and Bartels 1994; Murphey et al. 2001; Murphey and Townsend 2005; Townsend 2004).

Over the last 20 years, stratigraphically documented fossil collections made by workers from the University of Colorado Museum, Denver Museum of Nature and Science, University of Michigan Museum of Paleontology, and more recently by the San Diego Natural History Museum have added significantly to existing biostratigraphic knowledge of the Bridger Formation. These collections, together with precise provenance data, have made it possible to define formal biochronologic units for the Bridgerian North American Land Mammal Age (NALMA), most of which are based on stratotype sections that are located in the Bridger Formation. Gunnell et al. (2009) divided the Bridgerian into four "biochrons." Formerly referred to as Gardnerbuttean land mammal sub-age, or Br0, biochron Br1a is the only Bridgerian biochron not found in the Bridger Formation. Its stratotype section is the *Eotitanops borealis* interval zone of the Davis Ranch section of the Wind River Formation. Biochron Br1b is equivalent to the lower Blacksforkian, and its stratotype spans the Bridger A (lower part of the Blacks Fork Member). Biochron Br2 is equivalent to the upper Blacksforkian, and its stratotype section spans the Bridger B (upper part of the Blacks Fork Member). Biochron Br3 is equivalent to the Twinbuttean, and its stratotype section spans the entire Bridger C and D (Twin Buttes Member). The uppermost member of the Bridger Formation, the Turtle Bluff Member (or

Bridger E), is the stratotype section for the earliest Uintan biochron, Ui1a (Gunnell et al. 2009; Walsh and Murphey 2007). In summary, the mammalian fauna of the Bridger Formation has been used to formally define biochrons Br1b, Br2, Br3, and Ui1a.

The fossil assemblages of the Bridger Formation and other Eocene rock units in the greater Green River Basin provide an unprecedented opportunity to study ancient communities and environments. Studies of these fossils and the rocks in which they are preserved are the source of much of our knowledge of the Eocene Epoch of North America. The vertebrate faunas are of particular scientific importance because they represent an exceptional record of early Tertiary mammalian evolution and diversification spanning the Wasatchian, Bridgerian, and earliest Uintan NALMAs. The Bridger Formation contains locally abundant and well-preserved vertebrate and invertebrate (mollusk) fossils, and less common but scientifically important plant fossils. All members of the Bridger Formation are designated by the BLM as Potential Fossil Yield Classification (PFYC) Class 5.

4.2 RECORDS SEARCH RESULTS

The Denver Museum of Nature and Science and the University of Colorado Museum have a long history of scientific fossil collecting and research in the Bridger Formation. Neither institution (Ivy 2013, UCM 2001) has any previously recorded fossil localities within 3 miles of the Project area. In addition, the BLM KFO (Tingwall 2014) nor the BLM's review of localities in southwestern Wyoming (Robinson et al. 2002) has previously recorded fossil localities within the Project area.

4.3 FIELD SURVEY RESULTS

This section of the report presents the results of the field survey. The field survey results for the proposed pipeline are presented in Table 1, and photographs of the survey area are provided as Figures 3 through 5.

In total, three localities, all determined to be non-significant, were found during the pedestrian paleontological survey. The fossil localities occur in the informal subdivision A of the middle Bridger Formation in lacustrine and fluvial environments. Fossil locality forms and maps were prepared for all localities recorded during the field survey (Appendix A). Note that the confidential appendix is included only in agency copies of this report because the information includes sensitive location data that are exempt from the Freedom of Information Act.

Figure 3. View along the northern end of the canal survey area (PR-140717-07) on BLM lands. Facing northwest.

Table 1. Project Summary Table for Austin Canal Replacement Project Area.

Project Name	Austin Canal Replacement Pipeline Project			
Project Description	Proposed replacement of the existing canal with a series of pipelines			
Managing Land Agency	Bureau of Land Management, Kemmerer Field Office; Bureau of Reclamation Provo Area Office			
Location (PLSS)	Sections 2, Township 16 North, Range 115 West			BLM
	Sections 1, Township 16 North, Range 115 West; Sections 5 and 6, Township 16 North, Range 114 West; Sections 31, 33, and 34, Township 17 North, Range 114 West			Private
Topographic Map (24K)	Austin Reservoir (1968)			
Geologic Map	Dover, J.H. and J.W. McGonigle. 1993. Geologic Map of Evanston 30' X 60' Quadrangle, Uinta and Sweetwater counties, Wyoming. U.S. Geological Survey. Miscellaneous Investigations Series Map I-2168. Dover, J.H. and J.W. McGonigle. 2004. Geologic Map of Evanston 30' X 60' Quadrangle, Uinta and Sweetwater counties, Wyoming. Wyoming State Geologic Survey Open File Report 04-6.			
Geologic Formation(s)	Holocene – upper? Pleistocene	Secondary-stream alluvium	**PFYC**	Class 2
	Eocene	Bridger Formation, Bridger A - limestone 3*	**PFYC**	Class 5
		Bridger Formation, Bridger A	**PFYC**	Class 5
		Bridger Formation, Bridger A - limestone 2	**PFYC**	Class 5
Principal Investigator	Georgia E. Knauss		**Permit Number**	PA14-WY-216
Surveyor(s)	Vicki L. Meyers and Mark A. Gorman II			
Survey Date(s)	July 17 and 18, 2014		**Total Acres Surveyed (Pedestrian)**	200-foot buffer -233.94
Area Surveyed	The APE is defined as a 200-foot-wide corridor for the proposed pipeline			
Topography	Moderate rolling hills with moderate to dense vegetation cover with some marshy areas			
Bedrock Exposure Status	5%; exposed on slight slopes, on ridgelines, and in the deeper canal cuts			
Geological Description	Table 2			
Status of Previously Documented Fossil Localities in Area	Not applicable (NA), no previously recorded fossil localities within the survey area.			
Fossil Localities Discovered During Survey	Non-significant Fossil Occurrences: FR-140718-01, FR-140718-02, FR-140718-03 Significant Fossil Localities: None			
New Fossil Description(s)	**Number**	**Description**		**Infrastructure**
	FR-140718-01	Bivalvia undet. – 250+ internal molds, some with shell fragments; *Goniobasis* sp. – 250+ calcite molds, some with shell fragments		Pipeline

	FR-140718-02	Angiosperm undet. – 3 different species with smooth and serrated margins with up to 4 orders of venation; *Populus nebrascensis* – 3 orders of venation present along with a serrated margin; *Goniobasis* sp. – External mold with good detail		Pipeline
	FR-140718-03	*Goniobasis sp.* – 100+ shells and shell fragments; Bivalvia – 5+ shell fragments		Pipeline
Fossil Status of New Specimens	Not applicable.	**Repository of New Specimens**	Not applicable	

*Limestone 3 is mapped (Dover and McGonigle 1993) as a separate unit from the Tbg or "G" marker bed of McGrew and Sullivan 1970/Lyman limestone of Evanoff and others 1998; however, from discussions with researchers working in the area and based on the types and distribution of fossils found in and near this unit in the Project area (e.g. *Goniobasis* sp. shells with fossils leaves in the unit immediately below) limestone 3 and the Tbg/"G" marker bed/Lyman limestone are probably the same unit.

Figure 4. View along the east pipeline alignment route along existing canal (PR-140717-13). Facing southwest.

Figure 5. View along the eastern portion of the existing canal (PR-140718-01). Facing southwest.

Table 2. Generalized Stratigraphy of the Austin Canal Replacement Pipeline Survey Area on BLM land.

Unit	Total Thickness (meters)	Approx. Thickness (meters)	Geologic Unit*		Lithology Description		New Fossil Localities
					West Side	East Side	
5	2.6	0.5	Bridger B	Lyman limestone	-	Blocky to platy, yellowish-gray (5Y 7/2) weathering to yellowish-gray (5Y 8/1), moderately sorted, highly carbonaceous, moderately lithified sandy coquina, sharp bottom contact	FR-140718-01, FR-140718-03
4	2.1	1.0			-	Platy, light olive gray (5Y 6/1) weathering to grayish orange (10YR 7/4), highly carbonate, well lithified limestone	FR-140718-02
3	1.1	0.2	Bridger A		Shaley, grayish-orange (10YR 7/4) weathering to very pale orange (10YR 8/2), very fine grained, well sorted, moderately lithified sandstone with laminated bedding, sharp bottom contact	Shaley, grayish-orange (10YR 7/4) weathering to very pale orange (10YR 8/2), very fine grained, well sorted, moderately lithified sandstone with laminated bedding, sharp bottom contact	None
2	0.9	0.2			Platy, light olive gray (5Y 6/1) weathering to medium gray (N6), moderately lithified mudstone, sharp bottom contact	Platy, light olive gray (5Y 6/1) weathering to medium gray (N6), moderately lithified mudstone, sharp bottom contact	None
1	0.7	0.5			Platy, light olive gray (5Y 5/2) weathering to yellowish-gray (5Y 7/2), very fine to fine grained, moderately sorted, subangular, poorly consolidated sandstone with laminated bedding, sharp bottom contact	-	None
0	>0.2	>0.2			Platy, dusky yellow (5Y 6/4) weathering to yellowish-gray (5Y 7/2), well sorted, poorly consolidated mudstone, bottom contact not exposed	-	None

*Based on geologic mapping, literature review, discussions with active researchers, and field observations.

5.0 RECOMMENDATIONS

Table 4 provides a description of the recommendations for the Project based on the findings of the paleontological assessment and BLM guidelines (BLM 1998, 2007, 2008).

Table 3. General Project Recommendations.

Project Recommendation Summary	Paleontological clearance recommended for the surface and subsurface.
Project Recommendation	Immediate paleontological clearance is recommended because no scientifically significant fossils are located on the surface of the APE, and there is no direct evidence that suggests an elevated likelihood of subsurface fossils in the APE. If any subsurface bones or other potential fossils are encountered during construction anywhere in the APE, work in the immediate area (20-foot buffer) should cease, and the BOR and/or BLM and the Project federally permitted paleontologist should be notified immediately to inspect the discovery and make further mitigation recommendations, as appropriate, according to the scientific significance of the fossil(s) and in accordance with Department of the Interior (e.g. BLM and BOR) policies governing paleontological resources. Fossils discovered on private lands are the legal property of their respective landowner; therefore, all fossils that are determined to have scientific significance discovered during monitoring on private lands should be immediately reported to the landowner and salvaged (with the exception of extensive discoveries) in order to prevent potential construction delays that could occur should landowners be unable to be reached at the time of fossil discovery. For all scientifically significant fossil discoveries, landowners should be provided with three options: 1) to donate the fossil(s) to an approved paleontological repository that meets federally approved curation standards, where the fossils will be available for scientific research, education, and display; 2) to have the fossils salvaged and then given to the landowner in its field jacket or other storage container; or 3) to allow dispose of the fossil(s), waiving all claims for damages or loss of compensation for loss of economic value to the fossils.

6.0 LITERATURE CITED

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