

Exhibit 11

**SWCA Environmental Consultants,
Evaluation of Berlaimont Estates Access
Route Memorandum, Oct. 28, 2020**



ENVIRONMENTAL CONSULTANTS

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MEMORANDUM

To: Berlaimont Estates LLC

From: Jon Kehmeier, SWCA

Date: October 28, 2020

Re: **Evaluation of Berlaimont Estates Access Route Final Environmental Impact Statement and Draft Record of Decision**

Introduction

In September 2020, the U.S. Forest Service (USFS) published the Final Environmental Impact Statement (FEIS) and draft Record of Decision (draft ROD) for the Berlaimont Estates Access Route project (Berlaimont project). The Berlaimont project provides access to private property fully contained within National Forest Service lands in the White River National Forest. The private landowner, Berlaimont Estates LLC intends to construct an access road located partially on National Forest Service lands to develop nineteen single family residences.

The USFS analyzed a range of alternatives as part of their requirements pursuant to the National Environmental Policy Act (NEPA). The draft ROD states that “...both Alternative 2 and Alternative 3 are approvable and appropriate alternatives to meet the Purpose and Need...”.¹ If adopted, the USFS decision in the draft ROD will grant a special use authorization to construct Alternative 2. The USFS selected Alternative 2 “...because it has the least amount of impact and disturbance to NFS lands...” and because it “...avoids winter concentration areas for elk.” The following sections evaluate the impacts of both Alternative 2 and Alternative 3 to evaluate whether the findings in the FEIS and the Decision Rationale used in the draft ROD are supported.

Summary of Findings

The FEIS and draft ROD were reviewed to evaluate the rigor of the direct, indirect, and cumulative impact analyses and the Decision Rationale that were used to support the selection of Alternative 2. In summary, those findings were:

- The conclusion in the Decision Rationale in the ROD are not supported by the analysis in the FEIS or EIR and are not scientifically defensible given the information that was provided by the USFS. The combination of the larger direct impacts from Alternative 2 to elk winter range and severe winter range with the indirect and barrier effects of Alternative 2 does not support the conclusion that Alternative 2 is the least impactful to elk.

¹ United States Department of Agriculture Forest Service. 2020. Final Environmental Impact Statement, Berlaimont Estates Access Route, Draft Record of Decision, White River National Forest, Eagle County, Colorado. page 3

- Both Alternative 2 and 3 would have adverse impacts to elk winter range resulting from fragmentation, increased disturbance, and increased human use of the landscape during winter.
- Alternative 2 has greater direct impacts to elk winter range and severe winter range habitats than Alternative 3.
- The USFS relied on the direct impacts (as indicated by the number of road miles) occurring in elk winter range, severe winter range, and winter concentration areas as the rationale for selecting Alternative 2 despite the fact that Alternative 2 has higher impacts to two of the three winter range habitat classes.
- Indirect impacts to all types of elk winter range were not adequately evaluated in Decision Rationale presented in the ROD. The potential barrier effects of Alternative 2, impacts to wildlife movement corridors, and indirect impact to elk and the functionality of their habitat was not included in the Decision Rationale.
- Alternative 3 has greater direct impacts to elk winter concentration areas than Alternative 2, but for part of its length Alternative 3 is sited along an existing Forest Service road and within a utility corridor.
- The Biotic Assessment attachment of the July 2013 Berlaimont project Environmental Impact Report (EIR) analyzed the direct and indirect impacts that may result to elk and their habitat. These analyses were not consistently carried forward into the FEIS or considered in the Draft ROD. The EIR described potential barrier effects and resulting direct and indirect impacts to elk and their habitat that would result from large cut-and-fill slopes, retaining walls, and other disturbances associated with construction of a roadway up steep slopes.
- Had the indirect impacts of Alternatives 2 and 3 been compared and considered as part of the USFS Decision Rationale, it is probable that Alternative 2 could have greater impacts to elk winter range and the winter elk population than Alternative 3 as a result of creating a movement barrier between two elk winter concentration areas and severe winter range. Alternative 2 also would have greater indirect effects to elk using winter concentration area as the alternative's indirect effects would impact two winter concentration areas versus just one for Alternative 3.

Comparison of Impacts

Alternatives 2 and 3 share a common corridor using existing Forest Service roads until they cross Berry Creek (Figure 1). Shortly after the Berry Creek crossing, the routes for the two alternatives deviate. The alignment for Alternative 2 after the Berry Creek crossing traverses an extremely steep slope, requiring seven switchback turns. The entire alignment up this slope would require new construction as there is no existing road to follow in this location. Construction of this alignment would require excavation of 248,910 cubic yards of material and installation of 116,777 square feet of retaining walls.² The maximum wall height for Alternative 2 would be approximately 60 feet.

Alternative 3 traverses several slopes and would require two switchback turns, both of which occur on private lands and are generally shared with Alternative 2. The first half of the Alternative 3 alignment follows existing Forest Service Roads before it turns north and continues on to private lands. Construction of the Alternative 3 alignment would require excavation of 175,396 cubic yards of material

² Personal communication from Gary Brooks, Alpine Engineering, Inc.

and installation of 48,120 square feet of retaining walls.³ The maximum wall height for Alternative 2 would be approximately 28 feet.

The entirety of the Berlaimont project is located within elk winter range (Figure 2). Portions of the project also overlap with winter concentration areas and severe winter range. Colorado Parks and Wildlife define the different types of winter range as follows:⁴

- **Winter Range:** That part of the overall range where 90% of the individuals are located during the average five winters out of ten from the first heavy snowfall to spring green-up, or during a site specific period of winter as defined for each big game herd.
- **Severe Winter Range:** That part of the overall range where 90% of the individuals are located when the annual snowpack is at its maximum and/or temperatures are at a minimum in the two worst winters out of ten.
- **Winter Concentration Area:** That part of the winter range where densities are at least 200% greater than the surrounding winter range density during the same period used to define winter range in the average five winters out of ten.

Both Alternative 2 and 3 would have adverse impacts to elk winter range resulting from fragmentation, increased disturbance, and increased human use of the landscape during winter. With regards to fragmentation, consistent with the excavation and retaining wall values described above, USFS identifies that Alternative 2 would require substantially more cut and fill than Alternative 3, would have greater impacts from retaining walls, “would develop the hillside, fragmenting an area that could be left intact.”⁵

USFS analysis also demonstrated that Alternative 2 would have the greatest direct impact to elk winter range and severe winter range habitats when compared to Alternative 3⁶. Alternative 2 has 5.8 miles of roads in winter range and 3.4 miles of roads in severe winter range while Alternative 3 has 5.4 miles of roads in winter range and 2.1 miles in severe winter range. Direct impacts to elk resulting from Alternative 2 would be less than those from Alternative 3 only in winter concentration area habitats. Alternative 3 bisects the southern-most tip along an existing and runs along the western edge of one winter concentration area while Alternative 2 does not directly impact a winter concentration area but rather is located directly between and in close proximity to two winter concentration areas. While the Alternative 3 alignment does travel through the edge of a winter concentration area, it is sited along an existing Forest Road and within an existing energy corridor containing two above-ground high-voltage transmission lines.

To further evaluate direct and indirect impacts to elk and other wildlife species, USFS evaluated changes in wildlife permeability that would result from the alternatives. Wildlife permeability analysis was used

³ Personal communication from Gary Brooks, Alpine Engineering, Inc.

⁴ Cooley, C. P., A. Holland, M. Cowardin, M. Flenner, T. Balzer, J. Stiver, E. Slezak, B. Marette, D. Neumann, T. Elm and J. Holst. 2020. Status Report: Big Game Winter Range and Migration Corridors. Colorado Parks and Wildlife.

⁵ United States Department of Agriculture Forest Service. 2020. Final Environmental Impact Statement, Berlaimont Estates Access Route, White River National Forest, Eagle County, Colorado. page 244

⁶ United States Department of Agriculture Forest Service. 2020. Final Environmental Impact Statement, Berlaimont Estates Access Route, White River National Forest, Eagle County, Colorado. Pages 243-244

to determine how each alternative would impact wildlife movements across the landscape. From the common crossing at Berry Creek, Alternative 2 would bisect 11 known or potential wildlife movement corridors and Alternative 3 would bisect six. The 11 corridors bisected by Alternative 2 are located immediately between two elk winter concentration areas.

Additional impacts to elk that were identified in the FEIS include recreational impacts as well as attraction of elk to the road surface resulting from deicing salts and decreased snow cover. USFS identified that impacts to elk from recreation would be the same for all alternatives. USFS also identified that impacts resulting from attraction to the road surface would also be similar across all alternatives. While all alternatives will likely attract elk and other wildlife to the road surface in winter, the USFS analysis did not recognize that increased retaining wall extents and heights, guard rail requirements, and snow removal challenges could create different impacts to animals on the road. Elk and other wildlife that use the Alternative 2 road surface would have limited ability to evade traffic or escape the surface of the road due to the extensive retaining walls and high slopes. While these same impacts would occur for Alternative 3, the lesser extent and lower heights of retaining walls and the different cut and fill volumes would allow for more escape opportunities for elk and reduce potential impacts for wildlife/vehicle collisions.

[Assessment of Findings](#)

The FEIS analysis does not support the decision made in the draft ROD or the summary of impacts presented in the FEIS. In the FEIS comparison of impacts across all alternatives, the USFS found that Alternative 2 is the least impactful to winter elk. In the FEIS, the USFS stated:

“Alternative 2 roads avoid elk winter concentration areas and skirt the western edge of elk severe winter range. The Alternative 2 road alignment would fragment less winter range and leave a larger block of winter range intact and effective. Impacts of Alternatives 3 and 4 to habitat are similar, both bisecting an elk winter concentration area, and essentially creating an island effect to elk with private development to the north, west, and east; however, Alternative 4 would extend the farthest to the west and fragment the largest area of habitat. Both Alternatives 3 and 4 would cause declines to the wintering elk herd. As a result, among the action alternatives, Alternative 2 is the least impactful to wintering elk.”⁷

The Decision Rationale in the Draft ROD used this summary of the analyses as well as the determination that Alternative 3 has the least impact to National Forest Lands to support the selection of Alternative 2. The Decision Rationale in the Draft ROD states:

“I have chosen Alternative 2 as the Selected Alternative because it has the least amount of impact and disturbance to NFS lands... In addition, as outlined in the FEIS, the road alignment for Alternative 2 avoids “winter concentration areas” for elk ... Avoiding these winter concentration areas provides for additional protections for wildlife that are adversely impacted by this project...

⁷ United States Department of Agriculture Forest Service. 2020. Final Environmental Impact Statement, Berlaimont Estates Access Route, White River National Forest, Eagle County, Colorado. page 245

“The overwhelming concerns about further degradation of elk populations in the area have prompted me to choose the alternative that minimizes impacts to elk as best possible... Ultimately, I decided to choose Alternative 2 because it has the least impacts on NFS lands, and the road alignment avoids crucial winter concentration areas for elk.”⁸

This comparison of the impacts among action alternatives and the Decision Rationale in the ROD is contradictory to the analyses presented in the FEIS and summarized above as well as the data and analysis provided in the EIR. Each of the summary items described in the FEIS and the Decision Rationale presented in the previous paragraphs are evaluated in detail below.

- FEIS: *Alternative 2 roads avoid elk winter concentration areas and skirt the western edge of elk severe winter range.*
- ROD: *In addition, as outlined in the FEIS, the road alignment for Alternative 2 avoids “winter concentration areas” for elk ... Avoiding these winter concentration areas provides for additional protections for wildlife that are adversely impacted by this project...*
- ROD: *In addition, as outlined in the FEIS, the road alignment for Alternative 2 avoids “winter concentration areas” for elk ... Avoiding these winter concentration areas provides for additional protections for wildlife that are adversely impacted by this project...*

While Alternative 2 avoids direct impacts to winter concentration areas, the USFS analysis presented on page 244 of the FEIS clearly demonstrates that Alternative 2 would have the greatest impact to elk severe winter range. It does not skirt the edge of severe winter range but rather has 3.4 miles of total roadway in severe winter range (a 1.6 times greater impact than Alternative 3). Additionally, the USFS finding that it avoids impacts to winter concentration areas only considers the direct impacts to winter concentration areas. Alternative 2 skirts the edge of two winter concentration areas, impacts 11 wildlife movement corridors likely used by elk to move between the winter concentration areas, and fragments an area between the two winter concentration areas that the USFS acknowledges “could be left intact.”⁹

The direct impacts to this unfragmented habitat as well as the indirect impacts that would occur to the winter concentration areas that are approximately 0.10-0.25 mile from the Alternative 2 road would likely result in impairments to the surrounding habitat. Additionally, the impacts of the large cut and fill slopes and the heights of the retaining walls would form an effective barrier preventing movement of elk between the two winter concentration areas and creating impacts that could exceed those of Alternative 3. The EIR supports the barrier effect and should have been considered in the FEIS analysis. Pages 32 and 33 of the Biotic Assessment attached to the EIR identifies that road sections on steeper slopes would prevent movement of animals across the landscape, limit access to winter forage, and could create a “complete barrier to local animal movements.” The EIR goes on to identify that these barriers would be exacerbated by guard rails, deep snow on cut and fill slopes, and areas with extensive retaining walls. The results of the increase barrier effect would result in increased energetic costs and reduced availability of winter range if elk are unable to move from one habitat patch to another. The FEIS failed to

⁸ United States Department of Agriculture Forest Service. 2020. Final Environmental Impact Statement, Berlaimont Estates Access Route, Draft Record of Decision, White River National Forest, Eagle County, Colorado. pages 4-5

⁹ United States Department of Agriculture Forest Service. 2020. Final Environmental Impact Statement, Berlaimont Estates Access Route, White River National Forest, Eagle County, Colorado. page 244

recognize and acknowledge these likely impacts and resulted in a finding that is not supported by the data or analysis. Given the larger number of retaining walls, steep slopes, habitat fragmentation, and guard rails, the larger barrier effect of Alternative 2 and the resulting impact to winter range and winter elk and other wildlife should have been accounted for and considered in the USFS decision. This likely would have changed the determination that Alternative 2 minimizes impacts to elk winter range.

The Draft ROD appears to rely entirely on the direct impacts to winter concentration area habitats as the rationale for selecting Alternative 2. The ROD, and FEIS, failed to fully account for the direct and indirect impacts of the alternatives. Based on the number of road miles in winter range as well as the direct and indirect impact language presented in the EIR, Alternative 2's impacts could exceed those of Alternative 3 as a result of the creation of a movement barrier between two winter concentration areas and the indirect impacts that Alternative 2 would have on two winter concentration areas and severe winter range.

- *FEIS: The Alternative 2 road alignment would fragment less winter range and leave a larger block of winter range intact and effective.*

This statement is not supported by and is counter to most of the analyses presented in the FEIS and EIR. As stated above, the FEIS analysis acknowledged that Alternative 2 would result in fragmentation of an area in winter range and severe winter range, between two concentration areas, that could otherwise be left intact. Additionally, with the exception of direct impacts to winter concentration habitats, the analyses in the FEIS and EIR suggest that Alternative 2 would result in the largest impacts in both winter range and severe winter range when compared to Alternative 3. The FEIS provided no analysis or justification related to size or effectiveness of winter range to support this statement. The EIR contradicts the analysis in the FEIS analysis and identified that the larger barrier effects that are likely with Alternative 2 would have larger impacts than Alternative 3 and could result in less winter range being available for use by winter elk. These EIR analyses should have been carried forward in the USFS NEPA analysis of the Berlaimont project.

- FEIS: *Impacts of Alternatives 3 and 4 to habitat are similar, both bisecting an elk winter concentration area, and essentially creating an island effect to elk with private development to the north, west, and east.*

Alternative 3 does bisect a winter concentration area and would result in direct and indirect impacts to that habitat. However, as described above, this analysis appears to be based on the number of road miles located inside of the winter concentration area polygons and does not consider indirect impact of road segments or alternatives that do not intersect with winter concentration areas but are immediately adjacent. Indirect impacts of Alternative 2 may be similar to or greater than the impacts of Alternative 3. Alternative 2 is immediately adjacent to two winter concentration areas and would likely impact the behavior of animals. As described in the EIR, because of the size and extent of the cut and fill slopes, retaining walls, and guard rails, Alternative 2 could create a “complete barrier to local animal movements and result in increased energetic costs and reduced availability of winter range if elk are unable to move from one habitat patch to another. This fragmentation would exceed the impacts of Alternative 3 and may result in both elk concentration areas becoming islands separated by Alternative 2.

In addition to the barrier effects and proximity to roads, elk are impacted by increased visibility of roads and traffic.¹⁰ The USFS FEIS and draft ROD acknowledge that Alternative 2 is highly visible and fragments a currently intact portion of the landscape. Increased visibility of roads associated with Alternative 2 as well as the alternative’s proximity to two different winter concentration areas and severe winter range could increase stress on a larger percentage of the elk population than Alternative 3 which bisects just the edges of single concentration area.

- FEIS: *Both Alternatives 3 and 4 would cause declines to the wintering elk herd.*

This statement is not supported by any analysis in the FEIS. The analyses had no obvious connection to population levels or trends. Using unsupported statements related to the population-level impacts of Alternative 3 to justify that Alternative 2 has lesser impacts and should be selected is not correct or defensible. If the analytical approaches in the EIR are correct, it is likely that Alternative 2 could have equal or greater impacts to the population because it impacts two different concentration areas, severe winter range, and has the highest overall direct impact in all winter range habitats. Combined with the potential barrier effects and the higher loss of wildlife permeability on the landscape, population-level impacts may be greatest for Alternative 2, especially in severe winters.

¹⁰ Montgomery, RA, GJ Roloff, and JJ Millspaugh. 2013. Variation in elk response to roads by season, sex, and road type. *The Journal of Wildlife Management* 77 (2), 313-325.

- FEIS: *As a result, among the action alternatives, Alternative 2 is the least impactful to wintering elk.*
- ROD: *"I have chosen Alternative 2 as the Selected Alternative because it has the least amount of impact and disturbance to NFS lands... In addition, as outlined in the FEIS, the road alignment for Alternative 2 avoids "winter concentration areas" for elk ... Avoiding these winter concentration areas provides for additional protections for wildlife that are adversely impacted by this project...*
- ROD: *Ultimately, I decided to choose Alternative 2 because it has the least impacts on NFS lands, and the road alignment avoids crucial winter concentration areas for elk."*

This conclusion and the Decision Rationale in the ROD are not supported by the analysis in the FEIS or EIR and is not scientifically defensible given the information that was provided by the USFS. The combination of the larger direct impacts from Alternative 2 to winter range and severe winter range with the indirect and barrier effects described above does not support that Alternative 2 is the least impactful. The larger levels of fragmentation that can be expected from the larger extents and heights of retaining walls, cut-and-fill slopes, and guard rails is likely to create a barrier between the two winter concentration areas and severe winter range. While Alternative 3 would have greater direct impacts to the southern and western edge of the western winter concentration area, the landscape between that concentration area and the winter concentration area and severe winter range area to the east would remain intact. Additionally, while there would be some expected barriers to movement from Alternative 3, the cut-and-fill volumes, retaining wall heights extents, and required guardrail extents are much lower and provide opportunities for the elk population to move more freely across the landscape between habitat patches.

Rationale related to minimizing impacts to National Forest Lands rely on direct impacts and number of road miles and do not fully account for the indirect impacts from Alternative 2 or other alternative alignments on adjacent private lands. Direct and indirect impacts from Alternative 2 would impact resources, including elk winter habitat, on National Forest Lands. The potential barrier effect between two winter concentration areas located on National Forest Lands and the indirect impacts on the functionality of habitat and elk behavior on National Forest Lands should have been fully considered and disclosed in the FEIS and the Draft ROD. As described in previous sections, while having fewer direct impacts to National Forest Lands, the overall impacts to resources on National Forest Lands may be greater from Alternative 2 than from Alternative 3.

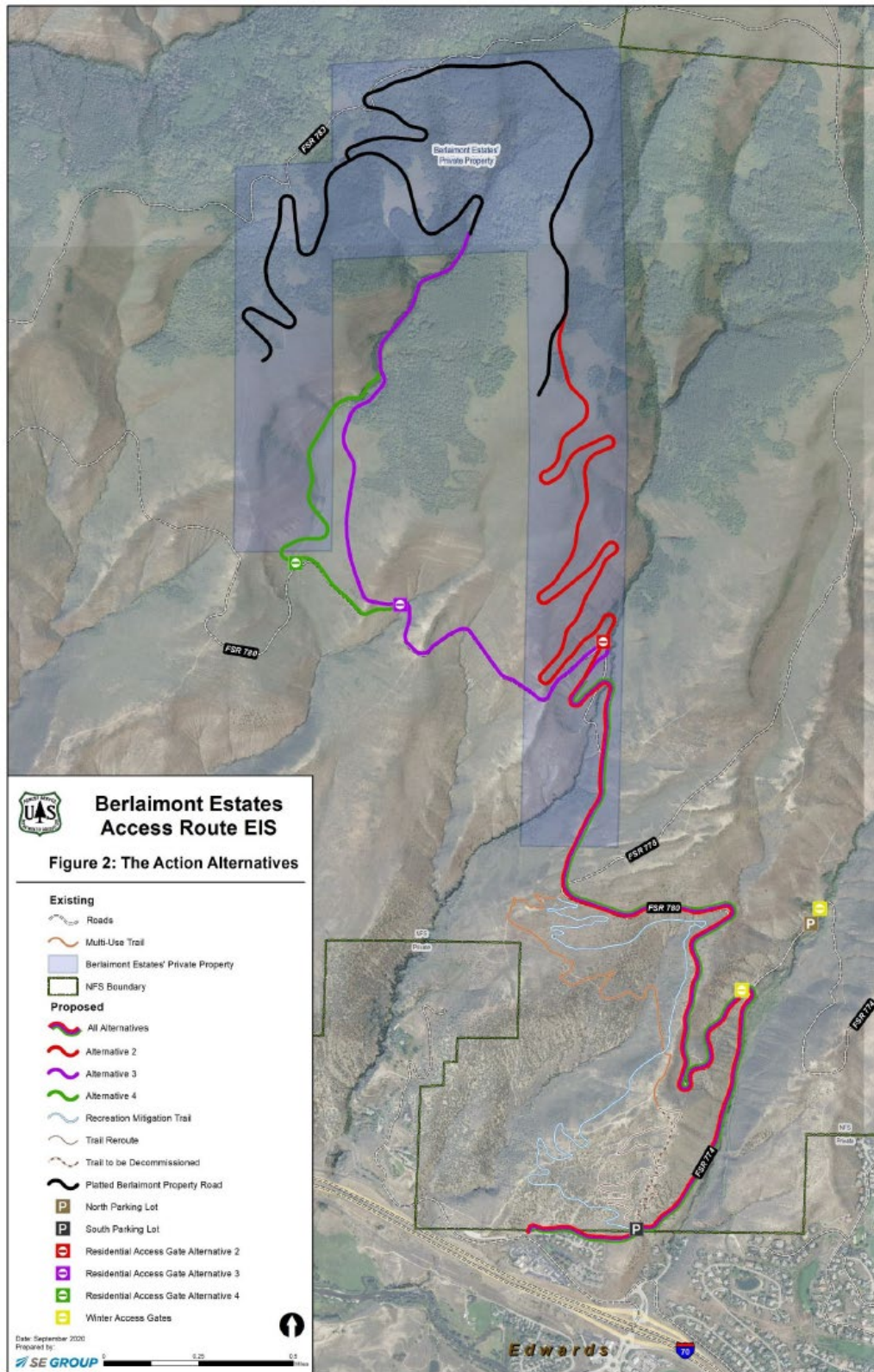


Figure 1. Action alternatives for the Berlaimont project. Taken from Figure 2 of the FEIS.

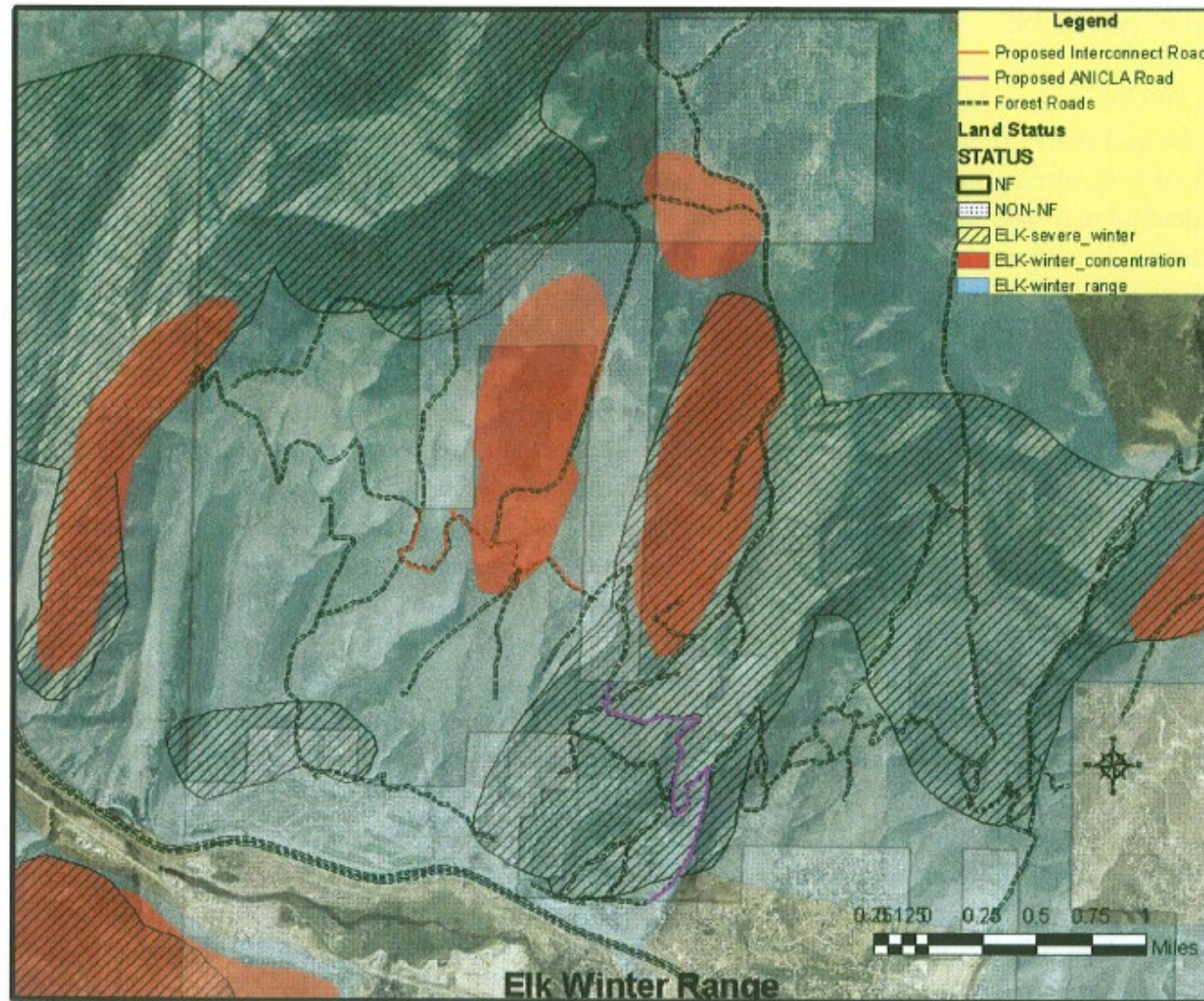
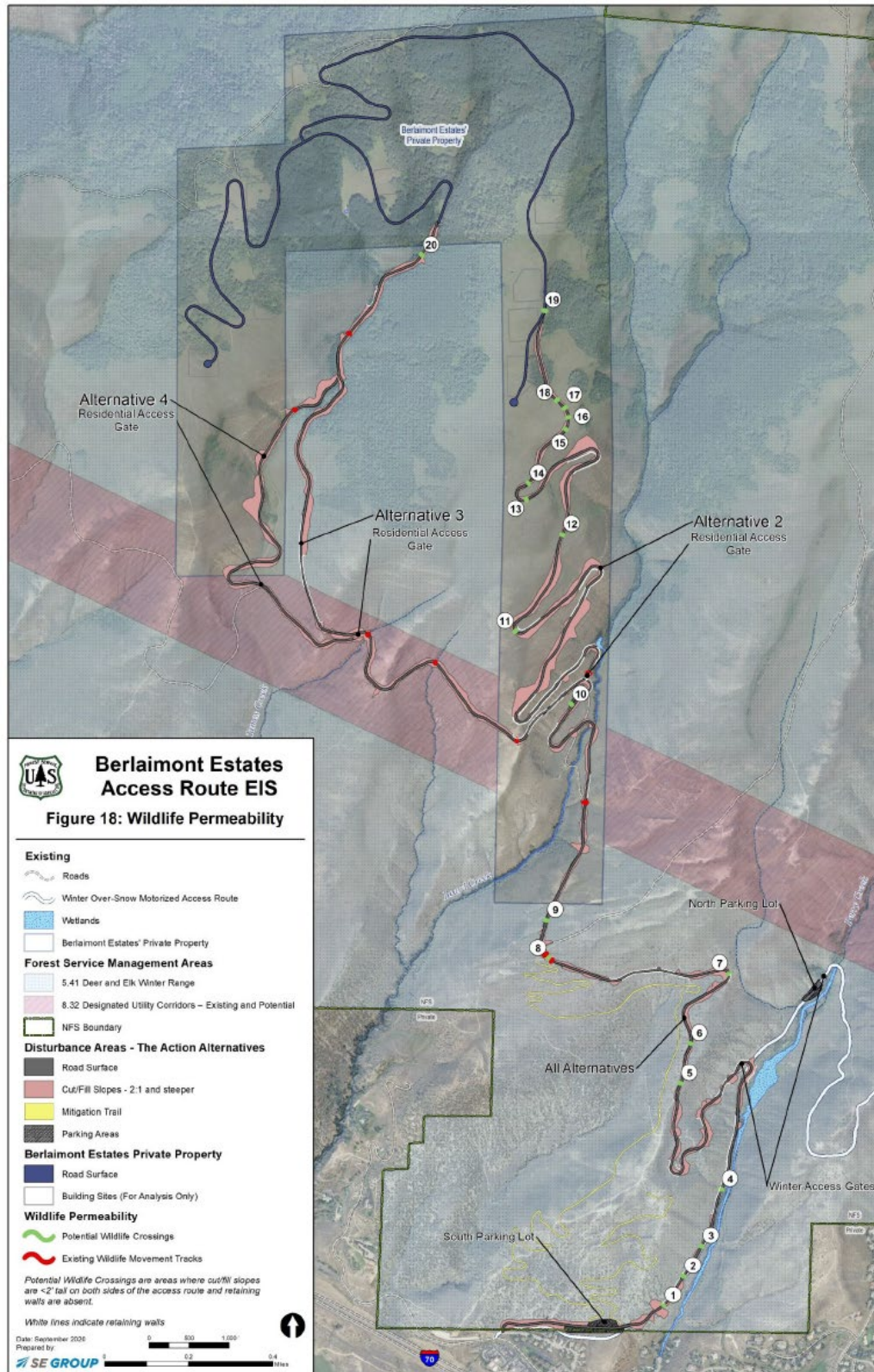


Figure 2. Elk winter range for the Berlaimont project. Taken from Figure 5 of Appendix B, Biotic Assessment of the 2013 EIR.



JON KEHMEIER, M.S., VICE PRESIDENT, SCIENTIFIC AND TECHNICAL SERVICES

Mr. Kehmeier is the Vice President of Scientific and Technical Services for SWCA's Rocky Mountain and Pacific Northwest Region. His specialties include strategic planning and development of permitting and compliance strategies for National Environmental Policy Act (NEPA), Clean Water Act (CWA), Endangered Species Act (ESA), and Bald and Golden Eagle Protection Act (BGEPA) and Migratory Bird Treaty Act (MBTA) issues across the United States. Mr. Kehmeier is currently one of SWCA's leading authorities on wildlife permitting and compliance strategies and NEPA compliance.

SELECTED PROJECT EXPERIENCE

YEARS OF EXPERIENCE

25

EXPERTISE

ESA Permitting

Bird and bat conservation strategies

Eagle studies

Eagle conservation planning

Permitting strategy

Statistics/analysis

Avian studies

Fisheries biology and management

Threatened and endangered species

Watershed analysis and planning

GIS applications for environmental assessment

Water quality monitoring and assessment

Hydrologic condition assessment

Aquatic/riparian habitat restoration and mitigation

Stormwater planning

EDUCATION

M.S., Bioresource Engineering; Oregon State University, Corvallis, Oregon; 2000

B.S., Fisheries and Wildlife Biology; University of Wyoming, Laramie, Wyoming; 1997

Absaroka Biological Monitoring; PGS Onshore, Inc.; Lincoln County, Wyoming.

Served as the third party contractor for BLM project conditions of approval. Monitoring included wildlife, rare plants, aquatic resource inspections and compliance reporting.

Role: Environmental Specialist.

Animas-La Plata Fish Passage Data Analysis; U.S. Bureau of Reclamation; La Plata County, Colorado.

SWCA analyzed mark recapture data on native fish to determine whether river diversions are barriers to upstream movement. *Role: Project Manager.*

Analyzed mark recapture data on native fish to determine whether river diversions are barriers to upstream movement, co-authored report.

Animas-La Plata Archaeology Project; Ute Mountain Ute Tribe; Durango, La Plata County, Colorado.

SWCA provided archaeological services for 10 years for permitting the Ridges Basin Reservoir with the Bureau of Reclamation for the Ute Mountain Ute Tribe. In addition to extensive excavations, this included coordinating tribal consultation and ethnographic reviews, including of such resources as the Ute Trail/Old Spanish Trail.

Role: Environmental Specialist.

Anthem Colorado at Broomfield; Pulte Home Corporation; Broomfield, City And County Of Broomfield, Colorado.

SWCA provided wildlife support for a multi-phase housing development, including prairie dog and burrowing owl surveys, state and county permitting for prairie dog removal and relocation, and the development and monitoring of wildlife conservation areas. *Role: Environmental Specialist.*

Arkansas River Shiner Critical Habitat Redesignation; Oklahoma Agricultural Legal Foundation; Multiple Counties, Multiple States.

Role: Aquatic Ecologist. Assess the biological and scientific validity of existing USFWS listing and critical habitat final rules for the Arkansas River shiner; evaluate proposed management actions and conservation measures that could reduce the amount of future designated critical habitat; conduct a limited field effort to assess condition of existing aggregations of the shiner; and develop an alternate proposal for critical habitat as appropriate.

Baker to Glendive Line Replacement Regulatory Compliance; Montana-Dakota Utilities Co.; County, Montana.

SWCA provided environmental compliance services for the Baker to Glendive 60-kilovolt replacement line project. *Role: Subject Matter Expert.*

West Bijou Creek Pipeline Replacement; El Paso Corporation; Arapahoe County, Colorado.

SWCA provided wetland delineation surveys and permitting under Section 404 of the Clean Water Act and ESA support for a pipeline replacement project on private land. *Role: Project Manager.*

CCA - Cedar Creek Anticline Pipeline - 2016; Denbury Resources, Inc.; Multiple Counties, Wyoming. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline (CCA) Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the CCA as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit.) Permitting includes applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single National Environmental Policy Act document. *Role: Senior Consultant.*

CCA - Cedar Creek Anticline Pipeline - 2018; Denbury Green Pipeline-MT, LLC; Multiple Counties, Wyoming. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline (CCA) Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the CCA as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit.) Permitting includes applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single National Environmental Policy Act document. *Role: Senior Consultant.*

CCA - Coral Creek Unit Pipeline and Enhanced Oil Recovery (EOR) Development Project; Denbury Onshore, LLC; Multiple Counties, Montana. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline (CCA) Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the CCA as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit.) Permitting includes applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single NEPA document. *Role: Senior Consultant. Mr. Kehmeier is SWCA's principal ecologist for greater sage-grouse issues on the project and is assisting Denbury with coordination of grouse impacts assessment and mitigation planning with the State of Montana, Montana Petroleum Association, and other stakeholders.*

CCA - Coral Creek Unit Pipeline Permitting and Field Development - 2017 AFE #RF.15.17393.CAP.SRV; Denbury Onshore, LLC; Multiple Counties, Wyoming. SWCA supported Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline (CCA) Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involved a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the CCA as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit.) Permitting included applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields were analyzed under a single NEPA document. *Role: Senior Consultant.*

CCA - East Lookout Butte Unit (ELOB) Pipeline and Enhanced Oil Recovery (EOR) Development Project; Denbury Onshore, LLC; Multiple Counties, Montana. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline (CCA) Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the CCA as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit.) Permitting includes applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single NEPA document. *Role: Senior Consultant. Mr. Kehmeier is SWCA's principal ecologist for greater sage-grouse issues on the project and is assisting Denbury with coordination of grouse impacts assessment and mitigation planning with the State of Montana, Montana Petroleum Association, and other stakeholders.*

CCA - Pennel Unit Pipeline and Enhanced Oil Recovery (EOR) Development Project; Denbury Onshore, LLC; Multiple Counties, Montana. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline (CCA) Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the CCA as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit.) Permitting includes applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single National Environmental Policy Act document. *Role: Senior Consultant. Mr. Kehmeier is SWCA's*

principal ecologist for greater sage-grouse issues on the project and is assisting Denbury with coordination of grouse impacts assessment and mitigation planning with the State of Montana, Montana Petroleum Association, and other stakeholders.

CCSM Sage-grouse Telemetry Units; Power Company of Wyoming, LLC; Carbon County, Wyoming. SWCA performed telemetry and demographic studies on greater sage-grouse to better understand their habitat use. The data collected are being used for environmental planning in order to avoid project impacts to the greater sage-grouse and other sagebrush-obligate species. *Role: Senior Consultant. Mr. Kehmeier oversees and coordinates activities related to ongoing natural resource, cultural resource, planning, conservation and compliance activities. Specific projects completed as part of the support services provided to Power Company of Wyoming include: avian monitoring, greater sage-grouse monitoring and research, permitting support, cultural resources support, and watershed/water resource monitoring.*

Cedar Creek Anticline Pipeline and Enhanced Oil Recovery Development Project; Denbury Onshore, LLC; Multiple Counties, Montana. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline (CCA) Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the CCA as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit.) Permitting includes applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single National Environmental Policy Act document. *Role: Senior Consultant. Mr. Kehmeier is SWCA's principal ecologist for greater sage-grouse issues on the project and is assisting Denbury with coordination of grouse impacts assessment and mitigation planning with the State of Montana, Montana Petroleum Association, and other stakeholders.*

Chimney Butte-Big Piney 230 kV Transmission and Substation NEPA Compliance; GeoEngineers, Inc.; Sweetwater County, Wyoming. SWCA provided comprehensive NEPA, planning, and environmental compliance as a third-party consultant. The project constructed approximately 14-miles of 138 kV transmission line to service new power demands in isolated areas of western Wyoming. SWCA assisted with cultural and historic resource and biological technical support services to provide feasibility and constraints analysis and develop the applicant-proposed alternative alignment. The project included pre-NEPA resource studies to identify and document cultural resources, visual assessment of known historic resources (Lander Trail), biological habitat studies, white-tailed prairie dog/burrowing owl surveys, raptor nest surveys, and paleontology studies. *Role: Environmental Specialist.*

Chokecherry and Sierra Madre Eagle Nest Monitoring; Power Company of Wyoming, LLC; Carbon County, Wyoming. SWCA is providing pre-construction raptor nest monitoring for environmental planning in order to avoid project impacts to eagles and other raptor species of concern. *Role: Senior Consultant. Mr. Kehmeier oversees and coordinates activities related to ongoing natural resource, cultural resource, planning, conservation and compliance activities. Specific projects completed as part of the support services provided to Power Company of Wyoming include: avian monitoring, greater sage-grouse monitoring and research, permitting support, cultural resources support, and watershed/water resource monitoring.*

Chokecherry and Sierra Madre Natural Resource; Power Company of Wyoming, LLC; Carbon County, Wyoming. As the environmental program manager for Power Company of Wyoming's Chokecherry and Sierra Madre Wind Energy project near Rawlins, Wyoming, SWCA oversees and coordinates activities related to ongoing natural resource, cultural resource, planning, conservation and compliance activities. Specific projects completed as part of the support services provided to Power Company of Wyoming include: avian monitoring, greater sage-grouse monitoring and research, permitting support, cultural resources support, and watershed/water resource monitoring. *Role: Program Manager. Mr. Kehmeier oversees and coordinates activities related to ongoing natural resource, cultural resource, planning, conservation and compliance activities. Specific projects completed as part of the support services provided to Power Company of Wyoming include: avian monitoring, greater sage-grouse monitoring and research, permitting support, cultural resources support, and watershed/water resource monitoring.*

Chokecherry and Sierra Madre Onsites; Power Company of Wyoming, LLC; Carbon County, Wyoming. *Role: Program Manager. Mr. Kehmeier oversees and coordinates activities related to ongoing natural resource, cultural resource, planning, conservation and compliance activities. Specific projects completed as part of the support services provided to Power Company of Wyoming include: avian monitoring, greater sage-grouse monitoring and research, permitting support, cultural resources support, and watershed/water resource monitoring.*

Chokecherry and Sierra Madre Planning & Prefield; Power Company of Wyoming, LLC; Carbon County, Wyoming. *Role: Program Manager. Mr. Kehmeier oversees and coordinates activities related to ongoing natural resource, cultural resource, planning, conservation and compliance activities. Specific projects completed as part of the support services provided to Power Company of Wyoming include: avian monitoring, greater sage-grouse monitoring and research, permitting support, cultural resources support, and watershed/water resource monitoring.*

Chokecherry and Sierra Madre Site-specific POD Support; Power Company of Wyoming, LLC; Saratoga, Carbon County, Wyoming. *Role: Program Manager. Mr. Kehmeier oversees and coordinates activities related to ongoing natural resource, cultural resource, planning, conservation and compliance activities. Specific projects completed as part of the support services provided to Power Company of Wyoming include: avian monitoring, greater sage-grouse monitoring and research, permitting support, cultural resources support, and watershed/water resource monitoring.*

Chokecherry and Sierra Madre SPOD 1 Biological Surveys; Power Company of Wyoming, LLC; Carbon County, Wyoming. SWCA is conducting ROW surveys for the SPOD 1's of the CCSM project. *Role: Program Manager. Mr. Kehmeier oversees and coordinates activities related to ongoing natural resource, cultural resource, planning, conservation and compliance activities. Specific projects completed as part of the support services provided to Power Company of Wyoming include: avian monitoring, greater sage-grouse monitoring and research, permitting support, cultural resources support, and watershed/water resource monitoring.*

Chokecherry and Sierra Madre State and County Permitting Support; Power Company of Wyoming, LLC; Saratoga, Carbon County, Wyoming. SWCA is composing the reports for county permitting. *Role: Program Manager. Mr. Kehmeier oversees and coordinates activities related to ongoing natural resource, cultural resource, planning, conservation and compliance activities. Specific projects completed as part of the support services provided to Power Company of Wyoming include: avian monitoring, greater sage-grouse monitoring and research, permitting support, cultural resources support, and watershed/water resource monitoring.*

Chokecherry and Sierra Madre Environmental Training and Compliance Monitoring; Power Company of Wyoming, LLC; Carbon County, Wyoming. In 2016, Power Company of Wyoming entered the construction phase of a 1,000 turbine wind project and SWCA designed and implemented the environmental training and compliance program for on-site personnel, contractors, and visitors. SWCA also developed a robust, customized environmental compliance management system through a web-enabled, near real-time Project Portal, with daily and summary reports that allows for multi-party access in managing variance requests and approvals simultaneously across multiple contractors and construction spreads. *Role: Project Manager.*

Rands Butte Gas Development Project Environmental Assessment; Cimarex Energy Company; Sublette County, Wyoming. SWCA provided comprehensive environmental and NEPA compliance services as a Third-Party consultant for Cimarex Energy. The project installed high voltage power and other facilities in order to develop gas resources from the federal Riley Ridge Unit in southwestern Wyoming. Under the direction of the BLM Pinedale Field Office, SWCA evaluated potential impacts from the project on historic trails, riparian ecosystems and wetlands, paleontological resources, big game winter range, human health and safety, geological resources, and other resources. *Role: Environmental Specialist.*

Columbine Springs Biological Investigations; Pioneer Natural Resources; Rio Blanco County, Colorado. SWCA provided environmental support for a 10,000-acre project area including agency coordination, research, rare-plant modeling and field surveys, raptor nest inventories, and GIS mapping. *Role: Project Manager.*

Utah Lake Carp Population Estimate; Central Utah Water Conservancy District; Utah County, Utah. *Role: Project Manager / Scientist. Served as a key scientist in the development of a population estimate for common carp in Utah Lake, Utah. Project activities focused on finding alternatives that can be implemented to control carp populations in efforts to recover the endangered June sucker in Utah Lake. Primary responsibilities include QA/QC, sampling and analysis designs, and report preparation and review.*

Cragin Dam Fisheries Habitat Evaluation; Salt River Project Power Generation; Maricopa County, Arizona. *Role: Project Manager. Cragin Reservoir Quagga Mussel Investigations: Provides services to assess risks associated with potential introduction of quagga mussels into Cragin Reservoir in central Arizona. Responsibilities include overseeing collection and analysis of survey data to assess whether quagga mussels have been accidentally introduced into the reservoir and management measures that could be implemented if introduction has occurred.*

*East Clear Creek Spinedace Evaluations: Manages fisheries and aquatics projects in East Clear Creek below Cragin Reservoir (formerly Blue Ridges Reservoir), central Arizona, to evaluate potential habitat for the federally threatened Little Colorado spinedace (*Lepidomeda vittata*). The Little Colorado spinedace is a small minnow that is indigenous to small streams of the Little Colorado River Drainage, a tributary of the Lower Colorado River in the State of Arizona.*

Dairy Syncline Mine HEA Plan Review; Enviroscientists, Inc.; Idaho County, Idaho. SWCA evaluated the need for a HEA for general wildlife habitat to support the impact analysis for the project Environmental Impact Statement (EIS). Upon the decision to proceed with an HEA, SWCA worked with a multiple-agency ID team to develop a habitat service metric for general wildlife habitat and conduct a HEA. The results of the model will be used in the EIS to characterize loss of habitat within a range of defined habitat service levels per BLM specifications. *Role: Environmental Specialist.*

Dakota, Minnesota and Eastern Railroad Expansion Project-Powder River Expansion; HDR, Inc.; Minnehaha County, Multiple States. SWCA provided cultural resources personnel to support the DME Railroad Expansion Project-Powder River Basin Expansion. SWCA was responsible for coordinating and managing all archaeological, historic architectural, geomorphological, and paleontological subconsultants and field crews across all three project states (South Dakota, Minnesota, and Wyoming). In addition, SWCA also performed NRHP assessments on 31 architectural sites and more than 71 archaeological sites. *Role: Senior Ecologist. Advised client on potential ESA and sensitive species issues related to the expansion and new construction of a rail line across Minnesota, South Dakota, and Wyoming. Species affected included interior least tern, piping plover, Topeka shiner, black-footed ferret, and several BLM and Forest Service sensitive species.*

DP205/206 Water Line Biological and Cultural Resource Survey; Noble Energy, Inc.; Weld County, Colorado. SWCA provided cultural and natural resource surveys and reporting for a 7-mile water line and 6 water wells. *Role: Project Manager.*

DP601 Desktop Evaluation; Noble Energy, Inc.; Weld County, Colorado. SWCA conducted a desktop analysis for a cultural resources site. *Role: Project Manager.*

Eagle Prospect Habitat Equivalency Analysis (HEA) Modeling; Plains Exploration & Production Company; Sublette County, Wyoming. SWCA conducted a HEA for the proposed Eagle Prospect Energy Development project to determine the amount of compensation to the State of Wyoming required to offset the direct and indirect losses to mule deer habitat services, moose habitat services, and hunting opportunities that would result over the lifetime of the project. GIS modeling was used to estimate changing habitat scores across the landscape in response to anticipated disturbance associated with energy development and operation. *Role: Environmental Specialist.*

Endangered Species Act Aquatic Research Projects; New Mexico Interstate Stream Commission; New Mexico. *Role: Project Manager. Responsible for the management of projects in the Pecos River Basin related to the conservation and recovery of the threatened Pecos bluntnose shiner. Duties include staff supervision, quality control, and contract administration. Also provides expert services related to the conservation of the endangered Rio Grande silvery minnow in the Rio Grande and the Arkansas River shiner in the Canadian River.*

Energy Gateway Owner's Environmental Consultant; PacifiCorp; Salt Lake County, Utah. SWCA provided full-time environmental support for multiple projects associated with the Energy Gateway Transmission Expansion Program, which included over 2,000 miles of extra-high voltage transmission line projects (500 kV, 345 kV, and 230 kV) that will interconnect several planned and proposed substation facilities in the West. *Role: Environmental Specialist.*

Environmental Compliance Assistance, Phase II; New Mexico Interstate Stream Commission; Multiple Counties, New Mexico. *Role: Aquatic Biologist. Responsible for completion of aquatic ecology and water resource sections of an Environmental Assessment for the Rio Grande Watershed Restoration: Phase I project focused on establishing linkages between groundwater and surface water supplies in the Middle Rio Grande. Also responsible for preparing the National Pollutant Discharge Elimination System (NPDES) permit for direct discharge of pumped groundwater into the Rio Grande.*

Fish Community Sampling Methodology Evaluation; U.S. Bureau of Reclamation; Bernalillo County, New Mexico. SWCA conducted a statistical review of Rio Grande silvery minnow monitoring data collected by the Middle Rio Grande Endangered Species Collaborative Program, and from this analysis, developed a study was to determine the relative sampling efficiency of the three commonly used gear types for sampling the species. *Role: Environmental Specialist.*

Gateway South; PacifiCorp; Salt Lake County, Utah. SWCA has provided environmental staff extension support for the permitting and construction of this 425-mile, 500-kV transmission line and associated substations since 2008. Support services and tasks have included project management coordination, right-of-way, engineering, landowner support, agency coordination, NEPA adequacy, POD preparation and review, conditional use permitting support, geotechnical studies, contractor procurement, and preparation of as HEA to offset the loss of sage-grouse habitat. SWCA also authored a technical report associated with minimum line separation and assisted in co-location efforts with an adjacent project. *Role: Environmental Specialist.*

Gateway West; PacifiCorp; Salt Lake County, Utah. SWCA provided a detailed review and oversight during the completion of the Wyoming Industrial Siting Division Permit Application including socioeconomics, sensitive resources, and reclamation on behalf of Rocky Mountain Power. *Role: Environmental Specialist.*

Gateway West Implementation Support; PacifiCorp; Multiple Counties, Multiple States. The proposed Gateway West transmission line extends approximately 1000 miles across Wyoming and Idaho. SWCA specialists surveyed for noxious weeds, migratory birds, sensitive species, and rare plants. We travelled to each segment along the transmission line and completed the fieldwork necessary for a complete data recording to meet BLM standards. *Role: Senior Consultant.*

Gun Barrel, Madden Deep, and Iron Horse Environmental Impact Statement; Burlington Resources Oil & Gas Company, L.P.; Fremont County, Wyoming. SWCA provided full NEPA assistance services to the Bureau of Land Management Lander Field Office for this Environmental Impact Statement. The project was located in Fremont and Natrona Counties, Wyoming and covered three federal oil and gas units encompassing over 146,000 acres. SWCA prepared the EIS and provided all accompanying services, including air quality modeling and assessment, cultural resource inventory, and paleontological studies. SWCA also assisted the BLM with scoping, public involvement, and alternatives development. *Role: Environmental Specialist.*

Gunnison Energy Corporation Consultant Services; Gunnison Energy Corporation; Delta County, Colorado. SWCA completed biological and cultural resource surveys and acted as a third-party NEPA contractor for preparation of four Environmental Assessment (EA) documents and supporting permitting efforts for the BLM and USFS Paonia Field Office. These projects analyzed the potential impacts of several oil and gas well developments as well as more than 30 miles of gathering and transmission pipeline corridors in the Muddy Creek Basin. SWCA conducted wetland delineation surveys and procured wetland impact permits under Section 404 of the Clean Water Act and is in the fifth year of a multi-year watershed baseline assessment and monitoring study (habitat/ macroinvertebrate/water quality/sedimentation) for four active well development units for GEC in Gunnison and Delta counties. *Role: Project Manager.*

Hayden Ranch Water Resources Inventory; U.S. Bureau of Land Management; Leadville, Lake County, Colorado. SWCA was contracted by the Bureau of Land Management, in cooperation with the City of Aurora, to investigate an 1,800-acre historic ranch property in the headwaters of the Arkansas River Basin that contain a mosaic of wetland and stream habitat in order to characterize the habitat to facilitate management decisions involving wetland mitigation, public use, and considering rights-of-way for future wetland mitigation and infrastructure. *Role: Environmental Specialist.*

Hiawatha Regional Energy Development Environmental Impact Statement; Questar Corporation; Multiple Counties, Multiple States. SWCA prepared a third-party EIS for the BLM, providing environmental studies and NEPA compliance for the proposed development of up to 2,200 natural gas wells over 30 years, on 157,000 acres in southwest Wyoming and northwest Colorado. *Role: Project Manager. Serves as the Project Manager for this large EIS focused on the environmental impacts of drilling approximately 4,500 infill wells on the Colorado/Wyoming border. Primary duties include technical review of all deliverables to ensure consistency with various federal regulatory drivers and to ensure internal quality of analytical and writing processes, coordination with BLM to conduct project audits to assess successes/failures and adherence with schedule and budgetary requirements, and completion of internal project audits to ensure project quality and consistency.*

Hiawatha Regional Energy Development EIS; QEP Energy Company; Multiple Counties, Multiple States. Under contract to QEP, SWCA prepared a third-party EIS for the BLM, providing environmental studies and NEPA compliance for the proposed development of natural gas resources on 157,000 acres in southwest Wyoming and northwest Colorado. *Role: Environmental Specialist.*

Hondo to Lincoln Storm Water Pollution Prevention Plan; Penasco Valley Telephone Cooperative; Lincoln County, New Mexico. *Role: Project Manager. Project manager and lead scientist for the completion of a Storm Water Pollution Prevention Plan for 20 miles of telephone cable installation in Lincoln County, New Mexico.*

Horse Butte Wind Project; Utah Associated Municipal Power Systems; Bonneville County, Idaho. SWCA conducted biological surveys and wrote an Avian and Bat Protection Plan for a proposed wind farm development. Species surveyed included raptor nests, breeding birds, migratory birds, grouse, big game, and bats. *Role: Environmental Specialist.*

Horse Lake Wind Energy Environmental Services; Confidential Client; Lassen County, California. SWCA assisted in various facets of environmental compliance including: Permitting assistance, completion of a Plan of Development (POD), NEPA and CEQA compliance support, completion of an ABPP and ECP, botanical surveys, Anabat acoustic bat surveys, and various pre-construction avian surveys. *Role: Environmental Specialist.*

Middle Rio Grande Endangered Species Technical Support; New Mexico Interstate Stream Commission; Multiple Counties, New Mexico. *Role: Quality Control Officer. Completed quality assurance tasks related to the development of alternatives and the analysis of their impacts for the ESA collaborative program. Program activities include the development of research and recovery objectives for the endangered Rio Grande silvery minnow, interior least tern, and southwestern willow flycatcher.*

Pecos Bluntnose Shiner Population Estimate; New Mexico Interstate Stream Commission; Santa Fe County, New Mexico. SWCA developed new techniques for monitoring threatened Pecos bluntnose shiner in the Pecos River, including population estimation from removal samples and occupancy modeling. The population estimation techniques were published in the North American Journal of Fisheries Management (Widmer et al. 2010). *Role: Project Manager.*

Arkansas River Shiner Population Estimate Line in Support of National Environmental Policy Act Process for the Eastern New Mexico Rural Water System Project (ENMRWS Project); New Mexico Interstate Stream Commission; City And County Of Denver, New Mexico. SWCA conducted depletion sampling population estimates for fish at seven randomly selected sites on the Canadian River between Ute Reservoir and the New Mexico-Texas border, and extrapolated a reach-wide population estimate for Arkansas River Shiner based on density at sample site. *Role: Project Manager.*

Candidate Conservation Plan for Roswell Spring Invertebrates; New Mexico Interstate Stream Commission; Roswell, Chaves County, New Mexico. *Role: Aquatic Ecologist. Served as the project manager and co-principal author of documents meant for the development of a conservation plan that will identify conservation actions that can be taken to reduce threats to four Roswell Basin invertebrates that are proposed as endangered species in New Mexico and Texas. Duties include drafting key sections of the plan, identifying and assessing risks to invertebrate populations, and developing actions that can be taken to remove or mitigate threats.*

Carlsbad Water Operations and Water Supply Environmental Impact Statement; New Mexico Interstate Stream Commission; Santa Fe County, New Mexico. *Role: Project Manager. Served as the Biology Workgroup co-lead for the Carlsbad Project Water Supply and Water Conservation EIS. Duties included coordinating team meetings, authoring sections of the EIS, developing strategies for balancing complex and competing water resource needs, serving as a member of the ID Team, Alternatives Development workgroup, and Adaptive Management workgroup.*

Assessment of Mesohabitat Availability in the Pecos River Above Sumner Reservoir; New Mexico Interstate Stream Commission; De Baca County, New Mexico. *Role: Project Manager. Led efforts to assess habitat availability and constraints for possible reintroduction of the threatened Pecos bluntnose shiner in the Pecos River above Sumner Reservoir.*

Interstate Stream Commission Finalization of Egg and Larval Drift Analysis and Reporting; New Mexico Interstate Stream Commission; County, New Mexico. *Role: Project Manager / Principal Investigator. Responsible for conducting all aspects of a research plan to assess the egg and larval drift potential of threatened Pecos bluntnose shiner in the Pecos River, New Mexico. Project included coordination of large field crews, extensive field equipment requirements, complex data collection methodologies, and analysis and reporting of results. Reports and publications are being used in water resource planning activities in the Pecos River Basin.*

Middle Rio Grande Habitat Restoration Egg Drift and Monitoring; New Mexico Interstate Stream Commission; Multiple Counties, New Mexico. SWCA specialists conducted a study were to characterize egg and larval drift characteristics in the Middle Rio Grande between the Angostura Diversion Dam and the inflow to the Elephant Butte Reservoir delta area. *Role: Environmental Specialist.*

ISC Pecos Operations Biological Assessment; New Mexico Interstate Stream Commission; Santa Fe County, New Mexico. *Role: Senior Ecologist. Worked closely with Bureau of Reclamation and project stakeholders to assess the impacts of changing water operations in the Pecos River, New Mexico on federally listed species including the Pecos bluntnose shiner, interior least tern, and piping plover.*

Pecos River Above Sumner Egg Retention Study; New Mexico Interstate Stream Commission; Multiple Counties, New Mexico.

Role: Principal Investigator. Designed and implemented a research plan to assess the availability of suitable Pecos bluntnose shiner spawning conditions in the Pecos River above Sumner Reservoir. Research was focused on determining whether river reach was sufficient to retain large quantities of eggs and larvae and to assess whether potential reintroduction of the threatened fish would be possible.

Representation on the Upper Rio Grande Water Operations Review and Environmental Impact Statement; New Mexico Interstate Stream Commission; Bernalillo County, New Mexico. *Role: Environmental Scientist. Represents the NMISC as the team leader on the Water Quality Technical Team and Interdisciplinary (ID) Team for the Upper Rio Grande Water Operations Review and EIS. This EIS evaluates alternatives for operations of federal storage and diversion facilities in the Rio Grande Basin from Alamosa, Colorado to Fort Quitman, Texas.*

Rio Grande Silvery Minnow Egg Drift, Phase III; New Mexico Interstate Stream Commission; Multiple Counties, New Mexico. *Role: Principal Investigator. Since 2004, SWCA has been conducting extensive experiments to assess the potential for drift and retention of endangered Rio Grande silvery minnow eggs and larvae. Experimental design has focused on altering flood regimes and floodplain dynamics to maximize retention and recruitment.*

Rio Grande Egg Drift Study Phases I-III; New Mexico Interstate Stream Commission; Multiple Counties, New Mexico. SWCA designed and implemented a study to evaluate movement of Rio Grande silvery minnow (*Hybognathus amarus*) eggs through the Middle Rio Grande using artificial eggs (gellan beads). SWCA analyzed drift data collected during three experiments in 2005 and three experiments in 2007 to estimate silvery minnow egg retention values for the Albuquerque and Isleta reaches of the Rio Grande at low flow, high flow, and on the ascending limb of the hydrograph. Data were used to identify flow conditions conducive to egg retention. Published results in River Research and Applications in 2012. *Role: Principal Investigator.*

Jarbridge Exploration PoO and NEPA - Newcrest; Newcrest Resources Inc.; Jarbridge, Elko County, Nevada. This project proposed gold exploration activities over a 12-year period, which required the development of an EA and biological assessment (formal consultation) for USFS review and approval. State and federal permits were also developed concerning stormwater management, spill prevention, air quality, noxious weeds, reclamation, and greater sage-grouse mitigation. *Role: Senior Consultant.*

Jonah Infill Drilling Project Environmental Impact Statement; EnCana Corporation; Pinedale, Sublette County, Wyoming. SWCA was selected by the BLM and EnCana Oil & Gas, USA, to finish a stalled, third party-sponsored EIS for the development of 3,100 natural gas wells on a 30,500-acre Jonah Infill Drilling Project Area in west-central Wyoming. *Role: Project Manager.*

Kettle Creek Endangered Species Consultation; Vintage Companies; El Paso County, Colorado. SWCA conducted a habitat analysis of Preble's Meadow Jumping Mouse Habitat and determined the necessary steps to allow for potential development of portions of the property. *Role: Environmental Specialist.*

Line 2083 Lowering in the San Francisco River; El Paso Corporation; Greenlee County, Arizona. Project included the preparation of the FERC ER and associated resource reports to assist EPNG in obtaining a FERC Certificate of Public Convenience and Necessity to lower a natural gas pipeline beneath the San Francisco River in Greenlee County in critical habitat for the loach minnow. A fisheries survey and salvage of fishes San Francisco River at the EPNG crossing site were conducted using standard fisheries sampling methods, including electrofishing and seining equipment. A biological assessment was prepared for U.S. Fish and Wildlife Service and U.S. Army Corps of Engineers Section 7 consultation. A preconstruction notification was prepared for the Clean Water Act Section 404 permit, and cultural resource surveys were conducted to support Section 106 of the NHPA review. *Role: Environmental Specialist.*

Lincoln National Forest Sacramento Grazing Allotment Environmental Impact Statement; URS Corporation; Otero County, New Mexico. *Role: Project Manager. Lead technical scientist for a watershed assessment for the Sacramento Grazing Allotment EIS. Primary roles include evaluating project alternatives on watershed health, soils, water quality, and aquatic biota.*

Moxa Arch Area Infill Gas Development Project Environmental Impact Statement; EOG Resources, Inc.; Sweetwater County, Wyoming. SWCA and Environ worked with the U.S. Bureau of Land Management Kemmerer Field Office, EOG Resources, and 30 other oil and gas operators to complete an infill drilling project of 1,500 wells in the Moxa Arch Area of southwestern Wyoming. The planning area for the project was a 475,000-acre region located approximately between Rock Springs and Kemmerer, Wyoming. Our Team completed air quality modeling, socioeconomic analysis, and evaluation of major resource issues, including big game habitats, sage-grouse, cultural resources, recreation, visual resource management, grazing, and range management. *Role: Project Manager. The EIS is*

being completed to evaluate impacts of oil and gas development on the human and environmental resources of the 500,000 acre Moxa Arch natural gas field. As the project manager, oversees the NEPA process, ensures document quality, evaluated potential project alternatives, and manages an EIS team of nearly 20 individuals. Also, manages team of subcontractors focused on assessing regional air quality impacts of the Moxa Arch project as well as other oil and gas drilling projects in southwestern and central Wyoming, northern Colorado, and northeastern Utah.

Mt. Emmons Public Comment Analysis; KTB Decision Resources, Inc.; Gunnison County, Colorado. SWCA prepared an EA, provided support for public scoping meetings, developed a database for over 1,200 public scoping comments, analyzed comment responses and code comments, and produced a scoping report for the controversial Mount Emmons Baseline Geotechnical Studies Project, a potential molybdenum mine on lands within the Grand Mesa, Uncompahgre, and Gunnison National Forest. *Role: Environmental Specialist.*

Noble Energy Support Services; Noble Energy, Inc.; Weld County, Colorado. SWCA has provided on-going environmental support for multiple well pads and pipelines in Weld County, including desktop reviews, biological surveys, and cultural resource surveys. *Role: Project Manager.*

Normally Pressured Lance Environmental Assessment; EnCana Corporation; Sweetwater County, Wyoming. SWCA completed cultural resource surveys and reporting for over 6,000 acres near Pinedale, Wyoming. *Role: Assistant Project Manager.*

North Maybe Canyon Mine Aquatic Habitat Investigations; Alfred Benesch & Company; Caribou County, Idaho. SWCA conducted aquatic habitat investigations on the Mill, Kendall and Mosquito Creeks in the Blackfoot River Drainage. Tasks included field surveys of water quality, stream discharge, aquatic macroinvertebrates, stream morphology, and barriers to movement in order to identify suitable Yellowstone cutthroat trout habitat. *Role: Environmental Specialist.*

Northern Nevada Greater Sage-Grouse Monitoring Program; Confidential Client; Elko, Elko County, Nevada. SWCA coordinated with the U.S. Geological Survey and state agencies to develop protocols for population monitoring and habitat assessments for greater sage-grouse to inform site development. *Role: Senior Consultant.*

Overland Pass BLM Staff Support; Willbros Engineers, Inc.; Multiple Counties, Wyoming. SWCA teamed with Natural Resource Group to assist the Williams Field Services Company with cultural resource services for their proposed 755-mile natural gas liquid Overland Pass Pipeline. *Role: Environmental Specialist.*

Paa-Ko Archaeological Testing, Biological Evaluation and National Environmental Policy Act Documentation; Mountain Ranch, LP (c/o Roger Cox Financial Group); Bernalillo County, New Mexico. *Role: Environmental Specialist. Conducted the biological survey and evaluation report to ensure avoidance of any impacts to threatened or endangered species for a transportation project. Also provided the environmental review for Federal Highway Administration-approved categorical exclusion and biological evaluation reports being prepared as part of the NEPA compliance for the project. The project is adjacent to San Pedro Creek, a jurisdictional water.*

Pacific Connector Pipeline Habitat Equivalency Analysis; U.S. Fish and Wildlife Service; Coos County, Oregon. SWCA conducted an HEA to estimate acres of mature and old-growth forest that would need to be conserved through conservation easements to offset the loss of forested habitat with construction of the Pacific Connector Pipeline. This was part of the pre-construction mitigation planning phase of the pipeline project. *Role: Environmental Specialist.*

Rocky Mountain Research Station Support Services; Power Company of Wyoming, LLC; Carbon County, Wyoming. SWCA monitored vegetation characteristics of greater sage-grouse habitat throughout the Overland Trail Cattle Company Ranch. Other tasks include project management, GPS data management, and project oversight. *Role: Environmental Specialist.*

PCW Avian & Bat Protection Plan; Power Company of Wyoming, LLC; Carbon County, Wyoming. SWCA prepared an Avian Protection Plan (APP) and Bat Protection Plan (BPP) for the Chokeycherry and Sierra Madre Wind Energy Project. *Role: Program Manager. Mr. Kehmeier oversees and coordinates activities related to ongoing natural resource, cultural resource, planning, conservation and compliance activities. Specific projects completed as part of the support services provided to Power Company of Wyoming include: avian monitoring, greater sage-grouse monitoring and research, permitting support, cultural resources support, and watershed/water resource monitoring.*

PCW Avian and Bat Monitoring; Power Company of Wyoming, LLC; Carbon County, Wyoming. SWCA performed avian and bat monitoring activities for the Chokecherry and Sierra Madre Wind Energy Project. Tasks included winter, spring, summer and fall surveys to identify and monitor avian species; avian radar training; radar initialization; and data management, analysis and reporting. *Role: Program Manager. Mr. Kehmeier oversees and coordinates activities related to ongoing natural resource, cultural resource, planning, conservation and compliance activities. Specific projects completed as part of the support services provided to Power Company of Wyoming include: avian monitoring, greater sage-grouse monitoring and research, permitting support, cultural resources support, and watershed/water resource monitoring.*

Chokecherry Sierra Madre Wind Project Ecological Site Development; Power Company of Wyoming, LLC; Carbon County, Wyoming. SWCA ecologists developed protocols and conducted vegetation and soil surveys to support development of Ecological Site Descriptions and reclamation planning objectives. This information was used to develop site-specific reclamation plans and ecological site implementation plans to support project site-specific plans of development. *Role: Program Manager. Mr. Kehmeier oversees and coordinates activities related to ongoing natural resource, cultural resource, planning, conservation and compliance activities. Specific projects completed as part of the support services provided to Power Company of Wyoming include: avian monitoring, greater sage-grouse monitoring and research, permitting support, cultural resources support, and watershed/water resource monitoring.*

PCW Hugus Draw Fire Falcata Seeding Program; Power Company of Wyoming, LLC; Rawlins, Carbon County, Wyoming. *Role: Program Manager. Mr. Kehmeier oversees and coordinates activities related to ongoing natural resource, cultural resource, planning, conservation and compliance activities. Specific projects completed as part of the support services provided to Power Company of Wyoming include: avian monitoring, greater sage-grouse monitoring and research, permitting support, cultural resources support, and watershed/water resource monitoring.*

PCW POD Revision and DEIS Review; Power Company of Wyoming, LLC; Rawlins, Carbon County, Wyoming. SWCA assist Power Company of Wyoming with a revised Plan of Development for Chokecherry and Sierra Madre Wind Energy Project including Project Environmental Compliance Plan. *Role: Program Manager. Mr. Kehmeier oversees and coordinates activities related to ongoing natural resource, cultural resource, planning, conservation and compliance activities. Specific projects completed as part of the support services provided to Power Company of Wyoming include: avian monitoring, greater sage-grouse monitoring and research, permitting support, cultural resources support, and watershed/water resource monitoring.*

WYDEQ-LQD PCW Permit to Mine for Road Rock Quarry; Power Company of Wyoming, LLC; Carbon County, Wyoming. SWCA assisted with the preparation of a State of Wyoming Department of Environmental Quality Mine Permit and provided strategic support throughout the permitting process. Assistance included the preparation and support for the non-coal application for a permit to mine, Wyoming Department of Environmental Quality-Land Quality Division resource guidelines, and reclamation and bonding requirements. *Role: Ecologist.*

PCW Reclamation Plan; Power Company of Wyoming, LLC; Carbon County, Wyoming. *Role: Program Manager. Mr. Kehmeier oversees and coordinates activities related to ongoing natural resource, cultural resource, planning, conservation and compliance activities. Specific projects completed as part of the support services provided to Power Company of Wyoming include: avian monitoring, greater sage-grouse monitoring and research, permitting support, cultural resources support, and watershed/water resource monitoring.*

PCW Strategic Support Services; Power Company of Wyoming, LLC; Carbon County, Wyoming. *Role: Senior Consultant. Mr. Kehmeier oversees and coordinates activities related to ongoing natural resource, cultural resource, planning, conservation and compliance activities. Specific projects completed as part of the support services provided to Power Company of Wyoming include: avian monitoring, greater sage-grouse monitoring and research, permitting support, cultural resources support, and watershed/water resource monitoring.*

PCW Watershed Monitoring Program; Power Company of Wyoming, LLC; Carbon County, Wyoming. SWCA conducted baseflow condition surveys for watersheds draining the project site, including channel and streambed monitoring, greenline monitoring, streamflow, and water quality monitoring. Monitoring efforts are ongoing and will be used to support the Project's Master Reclamation Plan, Stormwater Pollution Prevention Plan, and other ongoing monitoring efforts being completed by private landowners and federal, state, and local agencies. *Role: Senior Consultant. Mr. Kehmeier oversees and coordinates activities related to ongoing natural resource, cultural resource, planning, conservation and compliance activities. Specific projects completed as part of the support services provided to Power*

Company of Wyoming include: avian monitoring, greater sage-grouse monitoring and research, permitting support, cultural resources support, and watershed/water resource monitoring.

PCW Wetland Remote Sensing; Power Company of Wyoming, LLC; Rawlins, Carbon County, Wyoming. SWCA use remote sensing to identify potential wetlands in PCW project area. Developed remote sensing model to inventory wetlands across a 300,000 acre project area. Combined multi-spectral photos and LIDAR data with publicly-available resources to classify various wetland and riparian cover types. *Role: Program Manager. Mr. Kehmeier oversees and coordinates activities related to ongoing natural resource, cultural resource, planning, conservation and compliance activities. Specific projects completed as part of the support services provided to Power Company of Wyoming include: avian monitoring, greater sage-grouse monitoring and research, permitting support, cultural resources support, and watershed/water resource monitoring.*

Paradise 230-kV Transmission Project Environmental Assessment; GeoEngineers, Inc.; Sublette County, Wyoming. SWCA provided Rocky Mountain Power (a division of PacifiCorp) with a third-party EA and environmental compliance services for a new 230-kV transmission project that provided as much as 180 MW of power to new industrial and commercial customers in Sublette County in southwest Wyoming. *Role: Environmental Specialist.*

Pinedale Resource Management Plan and Environmental Impact Statement; Pinedale, Multiple Counties, Wyoming. *Role: Aquatic Ecologist. Authored aquatic ecology and water resource sections of a Resource Management Plan for the Pinedale, Wyoming office of the Bureau of Land Management. Duties included assessing potential impacts to aquatic and water resources that might result from various management alternatives.*

Periphyton Compliance Monitoring; Pinnacle Gas Resources, Inc.; Big Horn County, Montana. SWCA conducted annual periphyton compliance monitoring for Pinnacle's Coal Creek Montana Pollutant Discharge Elimination System (MPDES) outfall on the Tongue River in Montana. SWCA analyzed results from field-gathered samples and submitted annual final summary reports to the Montana Department of Environmental Quality (MDEQ). MDEQ annually provided concurrence that this outfall complied with MPDES permit requirements. *Role: Environmental Specialist.*

Pioneer Biological Surveys; Pioneer Wind Park, LLC; Natrona County, Wyoming. SWCA conducted 2 years of pre-construction biological surveys for two 31-turbine wind parks in central Wyoming in accordance with the WGFD's Recommendations for Wind Energy Development in Crucial and Important Wildlife Habitat guidance document. These surveys included migratory bird point counts, raptor long-watches, fixed-wing and helicopter raptor nest and eagle roost surveys, passive and active bat surveys, greater sage-grouse lek counts and surveys, and a Watershed Assessment of River Stability and Sediment Supply Reconnaissance Level Assessment. *Role: Environmental Specialist.*

Pioneer Wind Park Post Construction Monitoring; Pioneer Wind Park I, LLC; Converse County, Wyoming. SWCA provided post construction avian and bat monitoring as well as Phase I ESA and worker environmental training support for the Pioneer Wind Park in compliance with the approved Project Conservation Plan and Eagle Conservation Plans (ECP). *Role: Senior Consultant.*

CCSM Phase I Pre-construction Biological Resource Monitoring; Power Company of Wyoming, LLC; Carbon County, Wyoming. SWCA completed reconnaissance level surveys for Wyoming pocket gopher and pygmy rabbit occurrences associated with approximately 39 miles of proposed haul road and water extraction road infrastructure for Phase I, and in accordance with the Wildlife Monitoring and Protection Plan for the Project Record of Decision. *Role: Senior Consultant.*

Jemez Pueblo Riparian Resource Management Plan; Pueblo of Jemez; Sandoval County, New Mexico. *Role: Project Manager / Scientist. Responsible for the development of a riparian resource management and restoration plan for the Pueblo of Jemez. Primary duties included the identification of restoration techniques with the highest likelihood of success in riparian areas along the Jemez River. Further responsibilities included the development of management plans that would increase the success of any restoration efforts.*

Pumpkin Creek Wind Avian Use Surveys; Invenergy Wind Development, LLC; Carbon County, Kansas. SWCA is providing pre-construction avian use surveys, sharp-tailed grouse lek surveys, acoustic bat monitoring, prey base assessments, aquatic resources assessments, and site characterization for a proposed new wind farm facility. *Role: Senior Consultant.*

Pumpkin Creek Wind Tier 1 and Tier 2 Site Characterization Report; Invenergy Wind Development, LLC; Multiple Counties, Nebraska. SWCA is conducting avian and bat surveys in support of Invenergy's compliance with the USFWS's Land-Based Wind Energy

Guideline, and Eagle Conservation Plan Guidance, including large and small bird avian use, raptor nests, prairie grouse leks surveys, passive acoustic bat study, wetland delineations, and eagle prey base assessment. *Role: Senior Consultant.*

Pumpkin Creek Wind - Year 2 Avian Use Surveys; Invenergy Wind Development, LLC; Carbon County, Kansas. SWCA is providing pre-construction avian use surveys, sharp-tailed grouse lek surveys, acoustic bat monitoring, prey base assessments, aquatic resources assessments, and site characterization for a proposed new wind farm facility. *Role: Senior Consultant.*

Jerritt Canyon Mine Threatened and Endangered Botanical Surveys, Biological Assessment, and Biological Evaluation; Queenstake Resources USA, Inc.; Elko County, Nevada. In support of potential minerals exploration, SWCA conducted a Class III cultural resources inventory of more than 4,000 acres on Bureau of Land Management and private property in the Independence Mountains. SWCA biologists also completed threatened, endangered, and sensitive species inventories in coordination with the U.S. Forest Service Mountain City District. This work was conducted in support of a biological assessment/biological evaluation for a proposed amendment to an exploration plan of operations for the Jerritt Canyon Mining District. Field studies were conducted within a 30-square-mile area to assess the distribution and status of 28 U.S. Forest Service Region 4 and U.S. Fish and Wildlife Service sensitive, threatened, endangered, and candidate species. The distribution and status of seven plants on the Nevada Natural Heritage Program "watch list," and the species composition and relative abundance of birds nesting in riparian habitats were also evaluated. *Role: Project Manager.*

Red River Total Maximum Daily Load; Daniel B. Stephens & Associates, Inc.; Rio Arriba County, New Mexico. *Role: Water Resources Scientist. Provided technical support for the Red River TMDL in northern New Mexico. This support included the evaluation of water quality impacts on native and non-native fish populations throughout the Red River watershed.*

Representation of Upper Rio Grande Water Operations Review and Environmental Impact Statement Technical Teams; New Mexico Interstate Stream Commission; Multiple Counties, New Mexico. *Role: Water Quality Scientist. Represents the NMISC as the acting team leader on the Water Quality Technical Team for the URGWOPS project. This EIS evaluates alternatives for operations of federal storage and diversion facilities in the Rio Grande Basin from Alamosa, Colorado to Fort Quitman, Texas.*

Response of the Pecos Bluntnose Shiner to Intermittency Flow in the Pecos River; New Mexico Interstate Stream Commission; Multiple Counties, New Mexico. *Role: Project Manager / Principal Investigator. Responsible for leading a large-scale ecological evaluation of the impacts of low flows and drought conditions on populations of threatened Pecos bluntnose shiner. Primary objectives of the study include the completion of field sampling, identification of additional information related to the life-history and habitat needs of the fish, development of flow/habitat relationships, and the identification of potential measures that will aid in the conservation and recovery of the species.*

Rio Grande Basin Water Quality Assessment; U.S. Bureau of Reclamation; Multiple Counties, Multiple States. SWCA assessed water quality conditions and develop water quality models for selected reaches of the Rio Grande from its headwaters in Colorado to Fort Quitman, Texas. Also included in this assessment was the analysis and modeling of water quality conditions in the Rio Chama and Rio Jemez in New Mexico. The models developed was used to evaluate the potential impacts of a variety of reservoir operations alternatives within the Rio Grande Basin. Results of the modeling efforts were compared with the water quality standards for the States of Colorado, New Mexico, and Texas and several Rio Grande Pueblos in New Mexico. Final work products were used to identify operational alternatives that either improve or minimally impact water quality conditions in the basin. *Role: Project Manager. Use C-Record instead. Responsible for managing and overseeing the analysis of water quality conditions in the Upper Rio Grande Basin from its headwaters to Fort Quitman, Texas. This includes the analysis of existing water quality conditions, the evaluation of trends in water quality, and the development of empirical models to project the impacts to water quality that could result from a variety of water operations alternatives in the basin.*

Rio Grande Basin Water Quality Assessment; U.S. Bureau of Reclamation; Multiple Counties, Multiple States. *Role: Project Manager. Responsible for managing and overseeing the analysis of water quality conditions in the Upper Rio Grande Basin from its headwaters to Fort Quitman, Texas. This includes the analysis of existing water quality conditions, the evaluation of trends in water quality, and the development of empirical models to project the impacts to water quality that could result from a variety of water operations alternatives in the basin.*

Rio Grande Watershed Study Environmental Assessment; New Mexico Interstate Stream Commission; Multiple Counties, New Mexico. *Role: Aquatic Biologist. Responsible for completion of aquatic ecology and water resource sections of an Environmental*

Assessment for the Rio Grande Watershed Restoration: Phase I project focused on establishing linkages between groundwater and surface water supplies in the Middle Rio Grande. Also responsible for preparing the National Pollutant Discharge Elimination System (NPDES) permit for direct discharge of pumped groundwater into the Rio Grande.

Ruby Pipeline Landscape-scale Ecological Assessment and BLM and USFWS Support Services; Ruby Pipeline Company, LLC; Multiple Counties, Multiple States. SWCA assisted the USFWS with compilation of reference materials for a Biological Opinion Administrative Record, an Endangered Species Act Conservation Agreement, a Migratory Bird Conservation Agreement, and a waterbody crossing analysis for a pipeline that crossed multiple field offices. SWCA reviewed the Sheldon Transportation Plan and a compatibility determination for the Ruby Pipeline Special Use Permit for transportation access through the Sheldon National Wildlife Refuge. *Role: Project Manager.*

Ryan Gulch Block Surveys; WPX Energy, Inc.; Rio Blanco County, Colorado. SWCA performed both site-specific and block surveys for cultural, biological (wildlife/raptors/rare plants), and paleontological resources as a third-party contractor to the BLM White River Field Office on a large-scale oil and gas well development in Rio Blanco County, Colorado. SWCA tasks included NEPA support compliance and assisting in the preparation of Environmental Assessment and Biological Assessment documents and supporting survey reports for both BLM and USFWS review. *Role: Environmental Specialist.*

PCW Sage-grouse Tagging and Monitoring; Power Company of Wyoming, LLC; Carbon County, Wyoming. SWCA performed telemetry and demographic studies on greater sage-grouse to better understand their habitat use. The data collected was used for environmental planning in order to avoid project impacts to the greater sage-grouse and other sagebrush-obligate species. *Role: Senior Consultant.*

San Juan Long Range Plan; U.S. Bureau of Reclamation; Salt Lake County, Multiple States. *Role: Project Manager. Overseeing the completion of the long range plan for Colorado pikeminnow and razorback sucker recovery activities in the San Juan River Basin. The plan outlines the recovery activities and conservation measures for the two fish species and identifies the timeline and costs for completing those activities.*

San Pedro Creek 14 Supplemental Studies; San Pedro Creek Land Company; Sandoval County, New Mexico. *Role: Watershed Scientist. Provided technical expertise for the San Pedro Creek Land Company. Duties included the participation in stakeholder-led watershed assessments and evaluations of potential impacts of land development and the implications it may have on stream conditions.*

Sigurd-Red Butte; PacifiCorp; Salt Lake County, Utah. SWCA provided full-time environmental support for multiple projects associated with the Energy Gateway Transmission Expansion Program, which included over 2,000 miles of extra-high voltage transmission line projects (500 kV, 345 kV, and 230 kV) that will interconnect several planned and proposed substation facilities in the West. *Role: Environmental Specialist.*

South Unit Oil and Gas Environmental Impact Statement; Berry Petroleum Company LLC; Duchesne County, Utah. As third-party contractor to the U.S. Forest Service, SWCA prepared an EIS for Berry Petroleum Company's oil and gas development project on the South Unit of the Ashley National Forest in Utah. SWCA assisted with all aspects of the NEPA process, including scoping, alternatives development, specialist reports, draft and final EISs, and preparation of a ROD. *Role: Environmental Specialist.*

Piceance Creek 3D Seismic; St. Croix Seismic, LLC; Rio Blanco County, Colorado. SWCA performed both site-specific and block surveys for cultural, biological (wildlife/raptors/rare plants), and paleontological resources as a third-party contractor to the BLM White River Field Office on a large-scale oil and gas well development in Rio Blanco County, Colorado. SWCA tasks included NEPA support compliance and assisting in the preparation of Environmental Assessment and Biological Assessment documents and supporting survey reports for both BLM and USFWS review. *Role: Environmental Specialist.*

Standpipe Substation Sage-grouse Habitat Assessment; PacifiCorp; Hanna, Carbon County, Wyoming. SWCA completed a habitat assessment for the Standpipe Substation. The project was completed in support of the Density and Disturbance Calculation Tool for the State of Wyoming. *Role: Project Manager.*

Tallgrass Migratory Bird Planning and Compliance Support; Tallgrass Operations, LLC; Multiple Counties, Multiple States. SWCA provided Migratory Bird Treaty Act Compliance support through development of a voluntary blanket monitoring plan for Tallgrass'

construction and maintenance operations throughout the Rocky Mountain Plains. The plan was developed with guidance and ultimate approval/adoption by USFWS Region 6. *Role: Senior Consultant.*

Trans West Express General Support Services; TransWest Express, LLC; Carbon County, Wyoming. SWCA is providing support services to TransWest Express, LLC for the development of the 850-mile TransWest Express Transmission Line Project from south-central Wyoming to Las Vegas, Nevada. SWCA is working with TransWest to develop permitting, compliance, and mitigation strategies for the project. SWCA's support services include the development of mitigation strategies for greater sage-grouse. This includes development of an HEA model that evaluates potential project impacts to greater sage-grouse and identifies the types and quantities of mitigation and conservation actions necessary to offset those impacts. The HEA process developed by SWCA has been cited by the U.S. Fish and Wildlife Service and the Bureau of Land Management as a component of the analysis framework for all major transmission lines in the western United States. To date, SWCA is the only company to have completed this analysis for greater sage-grouse on any type of project. *Role: Senior Consultant.*

TransWest Express Permitting Support; TransWest Express, LLC; Multiple Counties, Wyoming. SWCA is providing support services to TransWest Express, LLC for the development of the 850-mile TransWest Express Transmission Line Project from south-central Wyoming to Las Vegas, Nevada. SWCA is working with TransWest to develop permitting, compliance, and mitigation strategies for the project. SWCA's support services include the development of mitigation strategies for greater sage-grouse. This includes development of an HEA model that evaluates potential project impacts to greater sage-grouse and identifies the types and quantities of mitigation and conservation actions necessary to offset those impacts. The HEA process developed by SWCA has been cited by the U.S. Fish and Wildlife Service and the Bureau of Land Management as a component of the analysis framework for all major transmission lines in the western United States. To date, SWCA is the only company to have completed this analysis for greater sage-grouse on any type of project. *Role: Senior Consultant.*

TransWest Express Transmission Line Tortoise Study; TransWest Express, LLC; Multiple Counties, Multiple States. SWCA designed a study to aid in the understanding of transmission line and associated common raven (*Corvus corax*) nest impacts on desert tortoise (*Gopherus agassizii*). The study design has been developed to determine the timing, frequency, and distribution of nesting ravens along existing transmission lines located in desert tortoise critical habitat from Washington County, Utah to Moapa, Nevada. *Role: Senior Consultant.*

Trona Industry Sage-grouse Habitat Assessment; Wyoming Mining Association; Little America, Sweetwater County, Wyoming. SWCA is developing predictive habitat maps for sage-grouse suitability. These maps will be used to guide development on operator leases and to develop conservation strategies to avoid and minimize impacts to greater sage-grouse and other obligate species of sagebrush ecosystems. *Role: Senior Consultant.*

TWE Biological Surveys; TransWest Express, LLC; Multiple Counties, Multiple States. SWCA conducted habitat assessments and clearance surveys for Ute ladies'-tresses (*Spiranthes diluvialis*) in support of transmission line sighting and permitting processes. *Role: Project Manager.*

Upper Rio Grande Water Operations Review and Environmental Impact Statement; New Mexico Interstate Stream Commission; Alamosa, Multiple Counties, Multiple States. *Role: Senior Scientist. Served as the team leader on the Water Quality Technical Team and Interdisciplinary (ID) Team for the Upper Rio Grande Water Operations Review and EIS. This EIS evaluated alternatives for operations of federal storage and diversion facilities in the Rio Grande Basin from Alamosa, Colorado to Fort Quitman, Texas.*

Utah Lake Carp Population Study; Central Utah Water Conservancy District; Bernalillo And Utah Counties, Multiple States. *Role: Project Manager / Principal Investigator. Designed and implemented a research plan to estimate the population of common carp in Utah Lake near Provo, Utah. Using a mark-recapture design and an open population model, determined that as many as 12 million carp inhabit the lake and pose a major threat to the continued existence of the endangered June sucker. Worked with senior fisheries ecologists to model the response of the carp population to intensive harvest efforts to determine the cost and effort associated with reducing the population by 80-90%.*

Ute Tribe Block Surveys; Newfield Production Company; Uintah County, Utah. SWCA conducted archaeological, paleontological and wildlife resource surveys for Newfield Production Company oil and gas development on the Ute Tribal lands. *Role: Environmental Specialist.*

Sage-Grouse Support; Wasatch Wind Intermountain, LLC; Carbon County, Wyoming. SWCA provided an analysis of sage-grouse core area issues and developed a strategy and multiple alternatives for construction and operation of two potential wind facilities within a sage-grouse core area near Rawlins, Wyoming. At the client's additional request, SWCA provided advice on the Wyoming Game and Fish Department's wind energy development guidance impact to the client's potential wind projects in Wyoming. *Role: Environmental Specialist.*

White River Dome 3D Bio/NEPA; Whiting Petroleum Corporation; Rio Blanco County, Colorado. SWCA provided third-party support for a NEPA environmental assessment and biological assessment for the Bureau of Land Management and U.S. Fish and Wildlife Service for the White River Dome 3D project. Located on 48,000 acres in northwestern Colorado, the project area includes private as well as BLM White River Field Office and Colorado Division of Wildlife public lands. SWCA conducted paleontology, rare and sensitive plant, and Class I and Class III cultural resource studies and recommended ways to avoid or mitigate adverse effects of seismic exploration on historic properties. *Role: Environmental Specialist.*

Williams Ryan Gulch - Paleo; WPX Energy, Inc.; Rio Blanco County, Colorado. SWCA conducted a paleontological resource assessment, and developed and implemented a mitigation plan for the geophysical investigation for an approximately 120-square-mile project area. Rocks of the Eocene Wasatch and Green River formations were examined within the Piceance Creek Basin. Fossils were recorded at approximately 26 localities. Fossils were then prepared and curated at a designated repository, and a technical report was prepared. *Role: Environmental Specialist.*

Williams Ryan Gulch 3D/3C Seismic Environmental Assessment; WPX Energy, Inc.; Rio Blanco County, Colorado. SWCA performed both site-specific and block surveys for cultural, biological (wildlife/raptors/rare plants), and paleontological resources as a third-party contractor to the BLM White River Field Office on a large-scale oil and gas well development in Rio Blanco County, Colorado. SWCA tasks included NEPA support compliance and assisting in the preparation of environmental assessment and biological assessment documents and supporting survey reports for both BLM and USFWS review. *Role: Environmental Specialist.*

Wyoming Pipeline Authority Right-Of-Way Permitting Support; Wyoming Department of Environmental Quality; Laramie County, Wyoming. The Wyoming Pipeline Corridor Initiative (WPCI) Project is a network of 1,984 miles of pipeline right-of-way that will connect sources of carbon dioxide (CO₂) to existing oil fields that are suitable for enhanced oil recovery. The 24 proposed pipeline segments cross 12 counties in Wyoming: Big Horn, Campbell, Carbon, Fremont, Hot Springs, Johnson, Lincoln, Natrona, Park, Sublette, Sweetwater, and Washakie. To assess habitat suitability for listed species (ESA, BLM, and Ashley National Forest) within the study area for each segment, SWCA used predictive distribution models developed by the Wyoming Natural Diversity Database. A Special Status Species Report was prepared that addressed plant and animal species with potential to occur within each pipeline segment. *Role: Project Manager.*

Test Wells Cultural and Natural Resources Inventories; XTO Energy; Rio Blanco County, Colorado. SWCA completed biological, paleontological, and cultural resource surveys and acted as a third-party NEPA contractor for preparation of three environmental assessment (EA) documents and supporting permitting efforts for the BLM White River Field Office in Rio Blanco County, Colorado. These projects analyzed the potential impacts of oil and gas well developments as well as over 20 miles of gathering and transmission pipeline corridors in the Piceance Creek Basin. SWCA conducted wildlife and rare plant assessments for federally listed and BLM sensitive species as well as conducted wetland delineation surveys and permitting under Section 404 of the Clean Water Act. *Role: Program Director.*

Environmental Assessments for Oil and Gas Wells; Zenergy Operating Company, LLC; McKenzie County, North Dakota. The Bureau of Indian Affairs is preparing multiple EAs in cooperation with the BLM for the construction, drilling, completion, and production of exploratory oil and gas wells on the Fort Berthold Indian Reservation by Zenergy Operating Company, LLC (Zenergy). Facilities associated with the wells and well pads include roads, utility lines, production facilities, and equipment storage facilities. Zenergy contracted SWCA to conduct biological and archaeological investigations for each of the proposed well locations; the results of these investigations are presented in EAs and Class III reports developed for the individual locations. *Role: Environmental Specialist.*