Appendix I

Draft Biological Assessment

DRAFT BIOLOGICAL ASSESSMENT FOR THE UINTA BASIN RAILWAY ENVIRONMENTAL IMPACT STATEMENT

October 2020

Summary

On May 29, 2020, the Seven County Infrastructure Coalition (Coalition) filed a petition with the Surface Transportation Board (Board) requesting Board authority to construct and operate a new rail line in Carbon, Duchesne, Uintah, and Utah Counties, Utah. The Coalition's proposed rail line would provide a new rail connection between the Uinta Basin in northeastern Utah (Basin) and the interstate freight rail network. It would extend approximately 85 miles from terminus points in the Basin near Myton, Utah and Leland Bench, Utah to an existing Union Pacific (UP) rail line near Kyune, Utah.

As part of the process, the Board's Office of Environmental Analysis (OEA) is preparing a Draft Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA) to address potential effects of the proposed project. After screening multiple alternatives, OEA analyzed the environmental impacts of three Action Alternatives and a No-Action Alternative in the Draft EIS. All of the Action Alternatives would connect two terminus points near Myton, Utah and Leland Bench, Utah to an existing rail line near Kyune, Utah.

The purpose of this Biological Assessment (BA) is to fulfill OEA's obligations under Section 7(a)(2) of the Endangered Species Act (ESA) and NEPA to determine the proposed project's potential effects on federally listed species and designated critical habitat.

Based on the analysis of the potential effects of the proposed project on federally listed species that may occur in the action area, OEA determined that the proposed project ***May Affect, but is Not Likely to Adversely Affect*** Canada lynx and Mexican spotted owl; ***May Affect, and is Likely to Adversely Affect*** Colorado pikeminnow, humpback chub, bonytail, razorback sucker, Barneby ridge-cress, Pariette cactus, Uinta Basin hookless cactus, and Ute ladies'-tresses; and would have ***No Effect*** on June sucker and Western yellow-billed cuckoo.

Contents

Tables

Page

Figures

Acronyms and Abbreviations

Coalition	Seven County Infrastructure Coalition
BA	Biological Assessment
BLM	U.S. Department of the Interior, Bureau of Land Management
C.F.R.	Code of Federal Regulations
cm	centimeters
dBA	A-weighted decibel
EIS	Environmental Impact Statement
EMU	ecological management units
ESA	Endangered Species Act
ESRI	Environmental Systems Research Institute
Forest Service	U.S. Forest Service
FR	Federal Register
FRA	Federal Railroad Administration
GIS	Geographic Information System
IPaC	Information for Planning and Consultation
LAU	Lynx Analysis Units
LCAS	Lynx Conservation Assessment Strategy
mm	millimeters
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
OEA	Office of Environmental Analysis
PAHs	polycyclic aromatic hydrocarbons
RIPRAP	Recovery Implementation Program Recovery Plan
SEL	sound exposure level
SWPPP	stormwater pollution prevention plan
the Basin	Uinta Basin
U.S.C.	United States Code
UDEQ	Utah Department of Environmental Quality
UDOT	Utah Department of Transportation
UP	Union Pacific
UPDES	Utah Pollutant Discharge Elimination System
US 191	U.S. Highway 191
US 6	U.S. Highway 6
USFWS	U.S. Fish and Wildlife Service

Chapter 1
Introduction

The Seven County Infrastructure Coalition (Coalition) filed a petition on May 29, 2020, with the Surface Transportation Board (Board) pursuant to 49 United States Code (U.S.C.) Section 10901 in Docket No. FD 36284. The petition requests Board authority to construct and operate a new rail line in Carbon, Duchesne, Uintah, and Utah Counties, Utah. The Coalition is a political subdivision of the state of Utah established under an inter-local agreement by the Utah counties of Carbon, Daggett, Duchesne, Emery, San Juan, Sevier, and Uintah. The Coalition's proposed rail line would provide a new rail connection between the Uinta Basin (the Basin) in northeastern Utah and the interstate freight rail network. It would extend approximately 85 miles from terminus points in the Basin near Myton, Utah and Leland Bench, Utah to an existing Union Pacific (UP) rail line near Kyune, Utah. The Board's Office of Environmental Analysis (OEA) analyzed the environmental impacts of the proposed rail line.

OEA understands that the Coalition has entered into or intends to enter into agreements with Drexel Hamilton Infrastructure Partners (Drexel Hamilton), Rio Grande Pacific Corporation (RGPC), and the Ute Indian Tribe of the Uintah and Ouray Reservation (Ute Indian Tribe). If the Board were to authorize the proposed construction and operation, the Coalition states that Drexel Hamilton would be responsible for financing and the commercialization of the proposed rail line and RGPC would operate and maintain it. The Coalition expects that the Ute Indian Tribe would become an equity partner in the proposed rail line.[1]

The Coalition anticipates that rail traffic on the proposed rail line would primarily consist of trains transporting crude oil from the Basin to markets across the United States. The Coalition also expects that trains would transport frac sand into the Basin for use in the oil and gas extraction industry. In addition, the Coalition expects that shippers could use the proposed rail line to transport various heavy and bulk commodities found in the Basin, such as soda ash, phosphate, natural gas, oil shale, gilsonite, natural asphalt, limestone, bentonite, heavy clay, aggregate materials, bauxite, low-sulfur coal, and agricultural products. These products would be transported in cars added to crude oil trains or frac sand trains. The total volume of rail traffic would depend on future markets for crude oil, which is driven by global demand and capacity at oil refineries. Depending on those future market conditions, the Coalition estimates that as few as 3.68 or as many as 10.52 trains could operate on the proposed rail line each day, on average. That estimate includes between 3.68 and 9.92 crude oil trains, including both unloaded trains entering the Basin and loaded trains leaving the Basin, and between 0 and 0.6 frac sand trains, including both loaded trains entering the Basin and unloaded trains leaving the Basin. The Coalition expects that the majority of crude oil transported on the proposed rail line would originate from new extraction projects in the Basin or increased production at existing oil wells.

The Board's decision whether or not to authorize the Coalition's petition is a federal action requiring compliance with the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. § 1536). This law provides for the listing, conservation, and recovery of endangered and threatened species of plants

[1] As used in this document, references to the Coalition as the project applicant also refer to any private partners that may be involved in the construction and operation of the proposed rail line, including Drexel Hamilton Infrastructure Partners (Drexel Hamilton) and Rio Grande Pacific Corporation (RGPC).

and wildlife. Under the ESA, the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service is mandated to monitor and protect listed species. Section 7(a)(2) of ESA requires federal agencies to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat. Section 9 of ESA prohibits the take of listed animals. *Take* is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" (16 U.S.C. § 1532(19)). USFWS further defines *harm* to include significant habitat modification or degradation. Federal agency actions that do not result in jeopardy or adverse modification, but that could result in take, must be addressed under Section 7.

The proposed project is a *major construction activity* as defined under ESA regulations. This Biological Assessment (BA) was prepared in accordance with 50 Code of Federal Regulations (C.F.R.) Part 402, Interagency Cooperation—ESA of 1973, as amended, which interprets and implements 16 U.S.C. § 1536(a)–(d).

OEA identified three reasonable and feasible alternatives for consideration in the Environmental Impact Statement (EIS) process, collectively called the Action Alternatives (Section 1.1, *Proposed Rail Line Action Alternatives*). Although OEA is consulting with USFWS on the Coalition's preferred alternative (Whitmore Park Alternative), this BA addresses all Action Alternatives equally, including with information collected during field surveys for federally listed species along each of the three alternatives. Therefore, if the Board decides to license an Action Alternative other than the Whitmore Park Alternative, the information in this BA for the alternative that is licensed is sufficient for reinitiating Section 7(a)(2) consultation with USFWS.

1.1 Proposed Rail Line Action Alternatives

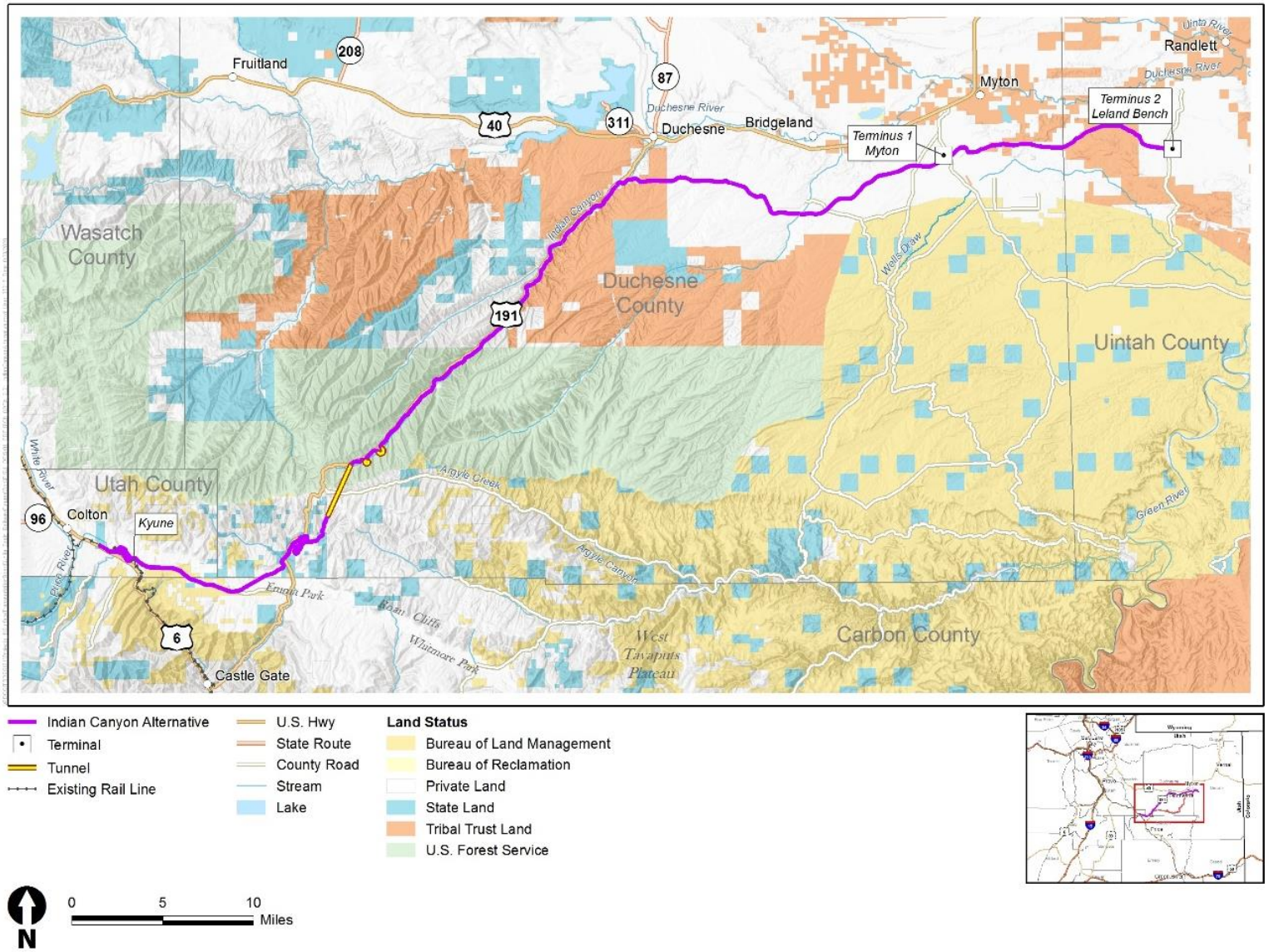
OEA's Draft EIS analyzed the environmental impacts of three Action Alternatives: Indian Canyon Alternative, Wells Draw Alternative, and Whitmore Park Alternative.

1.1.1 Indian Canyon Alternative

The Indian Canyon Alternative would extend approximately 81 miles from two terminus points in the Basin near Myton and Leland Bench to a connection with an existing UP rail line near Kyune (Figure 1-1). Starting at Leland Bench, approximately 9.5 miles south of Fort Duchesne, Utah, the route would proceed westward, past the South Myton Bench area, until intersecting Indian Canyon approximately 2 miles south of Duchesne, Utah. After entering Indian Canyon, the route would turn southwest and follow Indian Creek upstream toward its headwaters below Indian Creek Pass, paralleling U.S. Highway 191 (US 191) for approximately 21 miles. The Indian Canyon Alternative would use a summit tunnel to pass through the West Tavaputs Plateau near Indian Creek Pass on US 191. After emerging from the tunnel, it would descend the Roan Cliffs to reach Emma Park, an open grassy area at the base of the Roan Cliffs. The route would then run westward through Emma Park where it would split into a westbound and eastbound wye[2] configuration that would connect to the UP Provo Subdivision near the railroad timetable station at Kyune.

[2] The term *wye* refers to the Y-like formation that is created at the point where train tracks branch off the main line to continue in different directions.

Figure 1-1 Indian Canyon Alternative Map



In addition to the summit tunnel, the Indian Canyon Alternative would include two additional tunnels. Among the three Action Alternatives, the Indian Canyon Alternative would be the shortest in length.

The Indian Canyon Alternative would cross 12 miles of National Forest System land within Ashley National Forest. If the Board were to authorize this alternative, the Coalition would have to seek United States Forest Service (Forest Service) approval for permitting the rail line right-of-way, which could include amending the Ashley Forest Plan with a project-specific amendment in the areas of visual quality and scenery management, pursuant to the requirements of the 2012 Planning Rule (36 C.F.R. Part 219). Because the Indian Canyon Alternative would cross through roadless areas in Ashley National Forest, review and approval by the Regional Forester would have to be completed to ensure consistency with the 2001 Roadless Area Conservation Rule (36 C.F.R., Part 294, Subparts A and B).

The Indian Canyon Alternative would also cross 2.5 miles of U.S. Department of the Interior, Bureau of Land Management (BLM) land managed by the BLM Vernal Field Office, Price Field Office, and Salt Lake Field Office. Therefore, if the Board were to authorize this alternative, the Coalition would have to seek and obtain a right-of-way permit across BLM-managed public lands, pursuant to 43 C.F.R. Part 2800, before beginning construction.

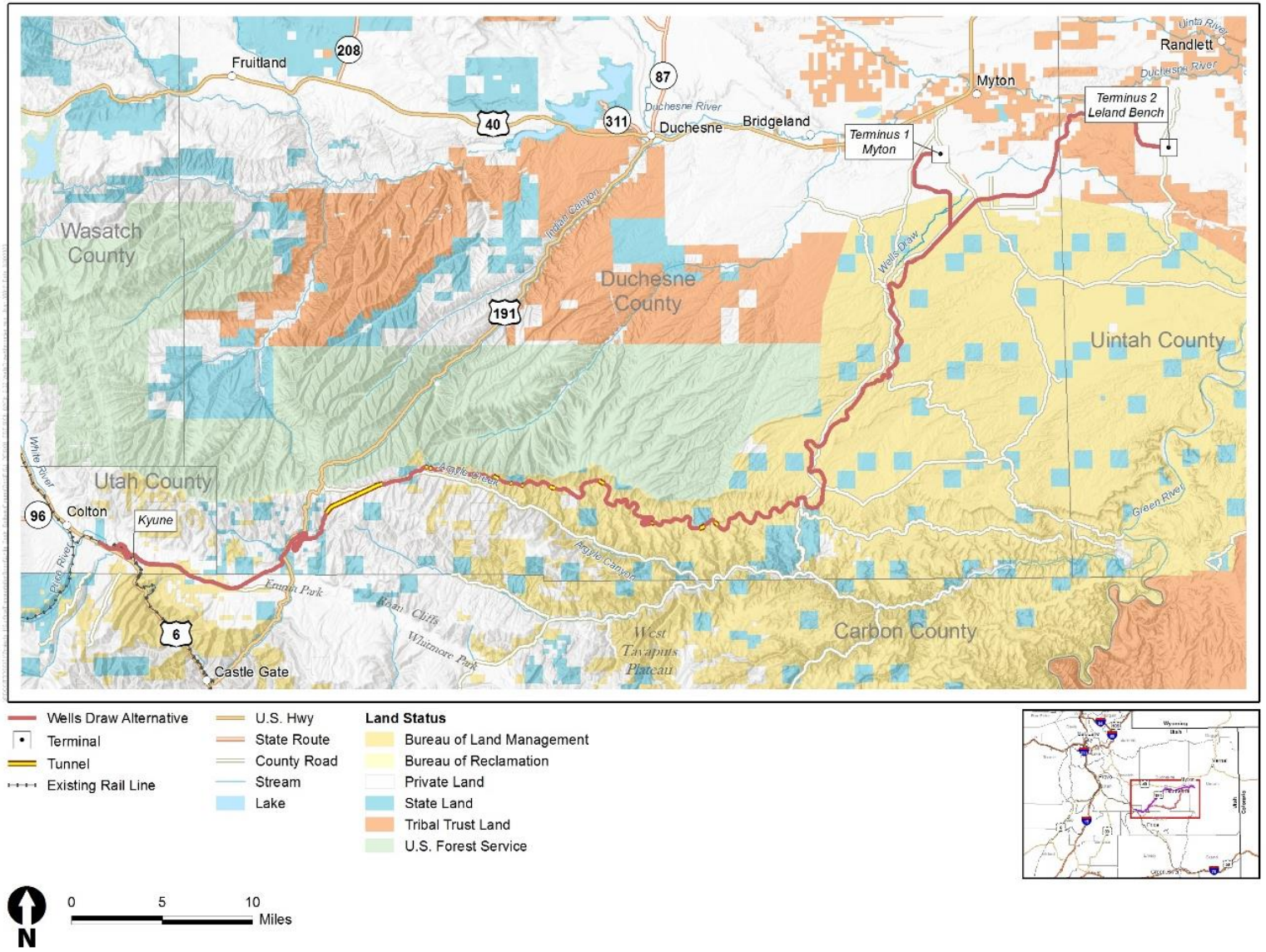
The Indian Canyon Alternative would also cross 8.1 miles of Tribal trust lands in the Uintah and Ouray Reservation. If the Board were to authorize this alternative, the Coalition would have to seek and obtain a consent resolution from the Ute Indian Tribe of the Uintah and Ouray Reservation (Ute Indian Tribe) and a grant of easement for right-of-way or leases, if necessary, from the Bureau of Indian Affairs (BIA) before beginning construction.

In addition to Forest Service, BLM, and Tribal trust lands, the Indian Canyon Alternative would also cross lands managed by the state of Utah and private land. If the Board were to authorize this alternative, the Coalition would be responsible for obtaining the necessary rights to construct and operate a new rail line on those lands.

1.1.2 Wells Draw Alternative

The Wells Draw Alternative would extend approximately 103 miles from two terminus points in the Basin near Myton and Leland Bench to an existing UP rail line near Kyune (Figure 1-2). The lines from the two terminus points would meet at a junction approximately 6.5 miles south of South Myton Bench. From the junction, the Wells Draw Alternative would run southward, generally following Wells Draw toward its headwaters. After reaching the headwaters of Wells Draw, the alternative would turn westward and enter Argyle Canyon. It would remain on the north wall of Argyle Canyon for approximately 25 miles, eventually reaching the floor of the canyon near the headwaters of Argyle Creek. The Wells Draw Alternative would then enter a summit tunnel through the West Tavaputs Plateau. The location of the summit tunnel's west portal would be similar to the Indian Canyon's summit tunnel west portal, but its east portal would be located in the upper reaches of Argyle Canyon instead of the upper reaches of Indian Canyon. After emerging from the tunnel, the Wells Draw Alternative would descend the Roan Cliffs to reach Emma Park. It would then run westward through Emma Park where it would split into a westbound and eastbound wye configuration that would connect to the UP Provo Subdivision near Kyune.

Figure 1-2. Wells Draw Alternative Map



In addition to the summit tunnel, the Wells Draw Alternative would include 12 additional tunnels. Among the three Action Alternatives, the Wells Draw Alternative would be the longest in length at approximately 103 miles.

The Wells Draw Alternative would cross 57.2 miles of land managed by the BLM Vernal Field Office, Price Field Office, and Salt Lake Field Office. If the Board were to authorize this alternative, the Coalition would have to seek and obtain a right-of-way permit across BLM-managed public lands, pursuant to 43 C.F.R. Part 2800, before beginning construction. In addition to BLM-managed land, the Wells Draw Alternative would also cross lands managed by the state of Utah and private land. If the Board were to authorize this alternative, the Coalition would be responsible for obtaining the necessary rights to construct and operate a new rail line on those lands. The Wells Draw Alternative would not cross National Forest Service land or Tribal trust lands.

1.1.3 Whitmore Park Alternative (Coalition's Preferred Alternative)

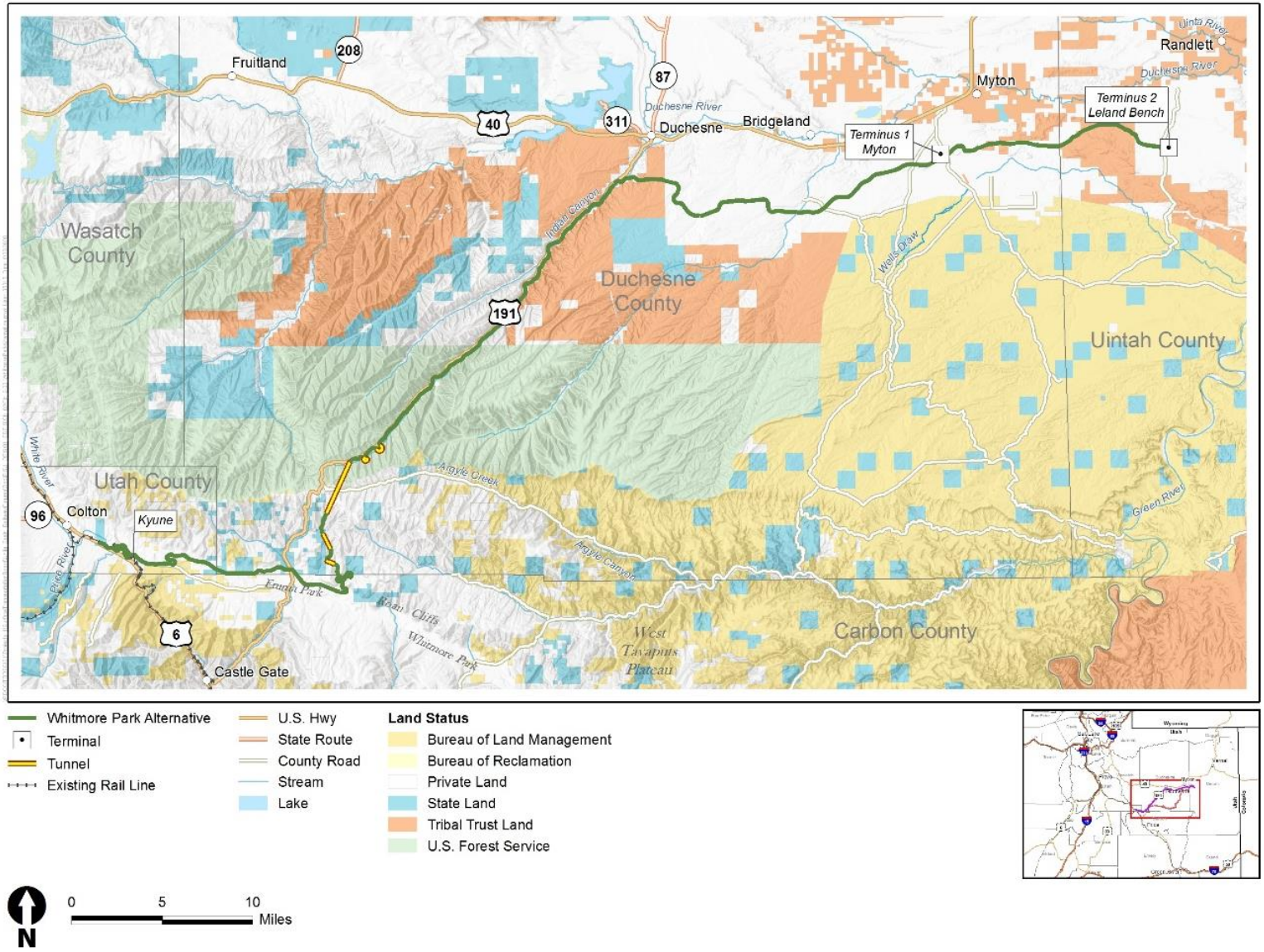
The Whitmore Park Alternative would extend approximately 88 miles from terminus points in the Basin near Myton and Leland Bench to an existing UP rail line near Kyune (Figure 1-3). This alternative would overlap for much of its length with the Indian Canyon Alternative. Approximately 23 miles west of the terminus point near Leland Bench, the Whitmore Park Alternative would diverge from the Indian Canyon Alternative, heading south to avoid the residential Mini Ranches area near Duchesne, Utah. It would then continue west to Indian Canyon and turn southwest to follow Indian Creek, paralleling US 191. Like the Indian Canyon Alternative, the Whitmore Park Alternative would use a summit tunnel to pass through the West Tavaputs Plateau near Indian Creek Pass on US 191. After emerging from the tunnel, the Whitmore Park Alternative would again diverge from the Indian Canyon Alternative to head south and southeast on its descent from the Roan Cliffs. After reaching Emma Park, it would follow Whitmore Park Road westward, cross US 191, and continue west along Quarry Road and Emma Park Road where it would split into a westbound and eastbound wye configuration that would connect to the UP Provo Subdivision near Kyune. In addition to the summit tunnel, the Whitmore Park Alternative would include four additional tunnels. Among the three Action Alternatives, the length of Whitmore Park Alternative is between the lengths of the Indian Canyon Alternative and Wells Draw Alternative.

The Whitmore Park Alternative would cross 12 miles of National Forest Service land within Ashley National Forest. If the Board were to authorize this alternative, the Coalition would have to seek Forest Service approval for permitting the rail line right-of-way, which could include amending the Ashley Forest Plan with a project-specific amendment in the areas of visual quality and scenery management, pursuant to the requirements of the 2012 Planning Rule. Because the Whitmore Park Alternative would cross through roadless areas in Ashley National Forest, review and approval by the Regional Forester would have to be completed to ensure consistency with the 2001 Roadless Area Conservation Rule.

The Whitmore Park Alternative would also cross 8.1 miles of Tribal trust lands in the Uintah and Ouray Reservation. If the Board were to authorize this alternative, the Coalition would have to seek and obtain a consent resolution from the Ute Indian Tribe and a grant of easement for right-of-way or leases, if necessary, from BIA before beginning construction.

In addition to Forest Service and Tribal trust lands, the Whitmore Park Alternative would also cross lands managed by the state of Utah and private land. If the Board were to authorize this alternative, the Coalition would be responsible for obtaining the necessary rights to construct and operate a new rail line on those lands. The Whitmore Park Alternative would not cross BLM-administered lands.

Figure 1-3. Whitmore Park Alternative



Chapter 2
Description of the Proposed Project

2.1 Construction and Design Features

This section describes the Coalition's plans for constructing the proposed rail line, including information pertaining to the rail line, temporary, and project footprints; railbed and track construction; materials for rail line construction; construction staging areas; staffing and worker housing; bridges, culverts, and other surface water crossings; grade crossings; road relocations; and facilities that the Coalition would construct as part of the proposed rail line. This section also describes the Coalition's anticipated construction schedule if the Board were to authorize the proposed rail line. Figures 1-1 through 1-3 include project construction and feature location information for the Indian Canyon Alternative, Wells Draw Alternative, and Whitmore Park Alternative, respectively.

2.1.1 Rail Line, Temporary, and Project Footprints

OEA has defined the following terms to describe the areas where construction and operation of the proposed rail line would occur.

- **Rail line footprint.** The rail line footprint includes the area of the railbed, as well as the full width of the area cleared and cut or filled. The rail line footprint would also include other physical structures installed as part of the proposed rail line, such as fence lines, communications towers, siding tracks, relocated roads, and power distribution lines. The rail line footprint is the area where rail line operations and maintenance would occur. The area would be permanently disturbed.
- **Temporary footprint.** The temporary footprint is the area that could be temporarily disturbed during construction, including areas for temporary material laydown, staging, and logistics. Disturbed areas in the temporary footprint would be reclaimed and revegetated following construction.
- **Project footprint.** The project footprint is the combined area of the rail line footprint and temporary footprint, both of which would be disturbed during construction, comprise where construction and operations of the proposed rail line would occur.

The width of the rail line footprint would vary depending on site-specific conditions, such as topography, soil slope stability, and other geotechnical conditions. Table 2-1 provides the length and area of the rail line, temporary, and project footprints for each Action Alternative.

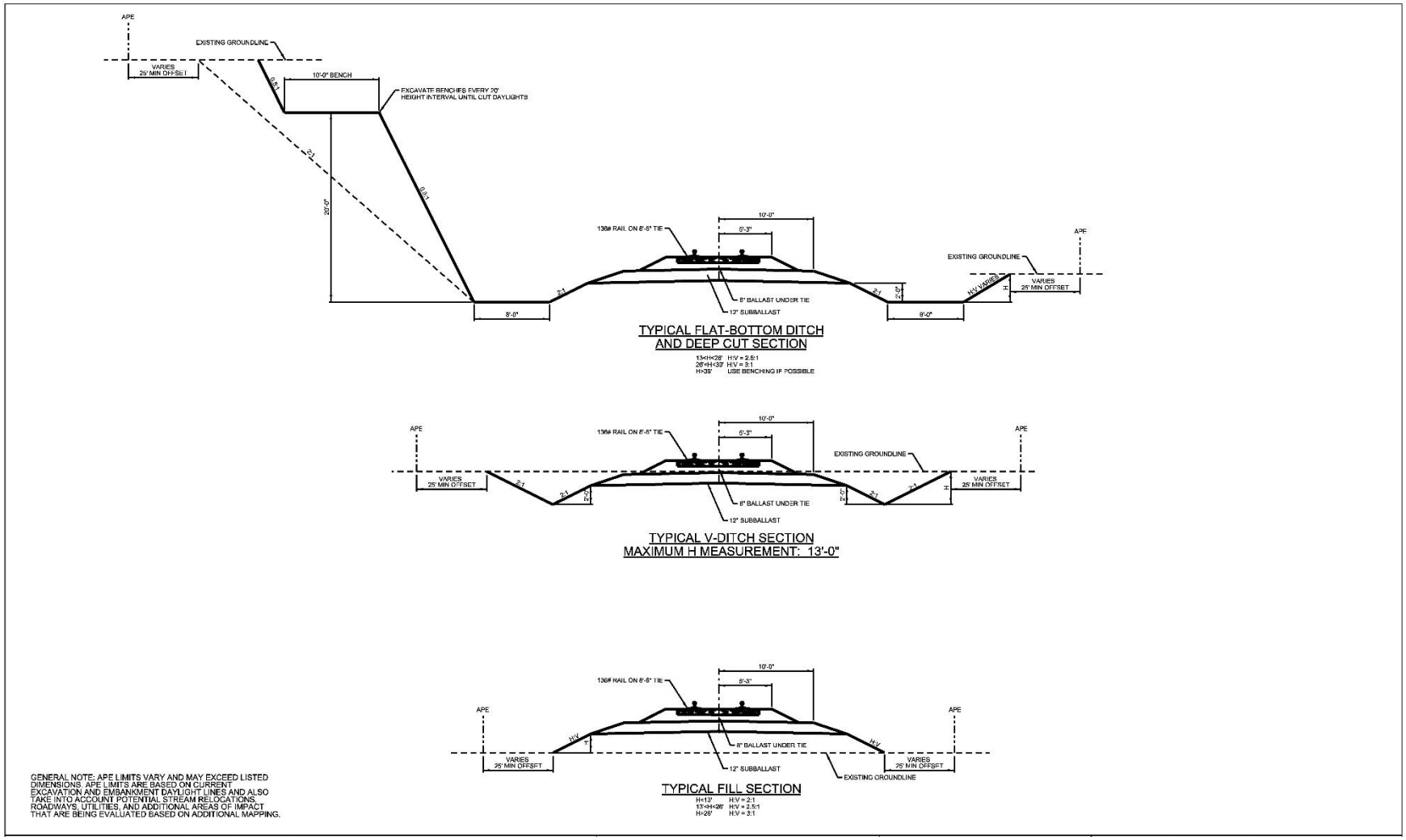
Table 2-1. Length and Footprints by Action Alternative

Action Alternative	Length (miles)	Rail Line Footprint (acres)	Temporary Footprint (acres)	Project Footprint (acres)
Indian Canyon	80.5	1,340.5	2,467.8	3,808.2
Wells Draw	103.3	2,560.1	5,095.2	7,655.3
Whitmore Park	87.7	1,430.6	3,087.7	4,518.3

The Coalition would either purchase the land or obtain easements for the entire project footprint. However, only the rail line footprint would be permanently cleared of vegetation for construction and operation of the proposed rail line. The Coalition might not need to use the entire project footprint after construction. As part of OEA's proposed mitigation, the Coalition would be required to reclaim and restore areas temporarily disturbed during construction within the temporary footprint after construction is completed (Chapter 7, *Mitigation and Minimization Measures*).

All of the Action Alternatives would require constructing temporary and permanent access roads. The Coalition would construct temporary access roads that would provide access to the rail embankment, tunnel portals, and bridge and drainage structure locations during construction. The Coalition would also construct several permanent access roads to provide access to rail sidings and long tunnels during rail operations. OEA expects that temporary and permanent access roads would be 13 feet wide, on average, and would connect to the nearest existing roadways to minimize the length of the access roads. Figure 2-1 presents example cross-sections of the rail line footprint.

Figure 2-1. Cross-Sections of the Proposed Rail Line Footprint



Source: Coalition 2019a

2.1.2 Railbed and Track Construction

Under any of the Action Alternative, the width of the railbed would extend approximately 10 to 20 feet from the centerline to the edge of the subballast. This distance would vary in cut-and-fill locations where ditches could be required. The Coalition would construct the track on top of approximately 12 inches of subballast material and 8 inches of ballast. Timber, steel, or concrete ties would support the continuously welded steel rail. The Coalition could use hot-mix asphalt under the ties if the final design indicates that this is practical. OEA expects that the Coalition would design the track to accommodate loading requirements and to support a gross weight of 315,000 pounds per rail car and 432,000 pounds per locomotive.[3]

2.1.3 Rail Line Construction Equipment and Methods

Construction of the proposed rail line would involve a variety of construction methods and equipment. Bull dozers, front-end loaders, and dump trucks would be used to create the appropriate corridor and grade. Cranes may be needed to construct bridges over roads and surface waters. Mining and potentially blasting methods would be used to construct tunnels. Rail would be laid and welded by track welding machine or crews where necessary.

2.1.4 Materials for Rail Line Construction

The Coalition would use existing, permanent quarries located in Carbon, Duchesne, Uintah, and Utah Counties to obtain and stockpile aggregate and rock materials. Trucks would deliver the materials to the rail line using existing roadways and temporary and permanent access roads. The Coalition anticipates obtaining concrete aggregate and subballast material from existing Utah Department of Transportation (UDOT)-certified quarries and ballast material from an existing rail-served quarry near Milford, Utah. If that source of ballast material were unavailable, the Coalition would obtain ballast material from existing rail-served quarries near Granite Canyon, Wyoming, and Carr, Colorado. The Coalition does not anticipate needing or developing new quarry sources. If the Coalition were to identify the need for additional sources during the final design phase of the proposed rail line, the Coalition would develop those sources in conformance with applicable local and state land use and permitting regulations and applicable UDOT specifications.

The Coalition intends to balance cut-and-fill material so that fill and spoil sites would not be required. During construction, subballast would be transported via truck, and ballast would be delivered by rail directly to its final location. Staging for subballast and ballast material would occur at the quarries from which those materials were obtained. The Coalition intends to obtain water for compaction, dust control, and concrete work from existing water right holders and would not pursue any new water rights. The Coalition would identify the specific existing water rights for construction during the final design phase based on discussions with current water right holders, timing of construction activities and seasonal availability, location of the water right point of diversion, and the type of water right diversion (e.g., well, surface water). The sources for water

[3] The estimated maximum weight of locomotives used by the proposed rail line would range from approximately 380,000 to 432,000 pounds. The typical weight of loaded crude oil rail cars operating over the proposed rail line is expected to be 143 tons, or 286,000 pounds, per car.

used during construction may include groundwater, surface water, potable water, or reclaimed and treated wastewater.

2.1.5 Construction Staging Areas

During construction of the proposed rail line, the Coalition intends to locate all temporary staging areas within the project footprint or in existing permanent industrial sites permitted for construction uses. To receive construction materials by rail, the Coalition would use existing permanent rail-to-truck transload facilities located in Salt Lake City, Ogden, Provo, Help, Price, and other locations in Utah, and would transfer the materials to trucks for final delivery to the project footprint. The Coalition would establish temporary material laydown, staging, and logistics areas within the project footprint at bridge locations, tunnel portals, roadway crossings, and other locations.

2.1.6 Staffing and Worker Housing

The average annual workforce during construction of all three Action Alternatives would include approximately 1,000 individuals, with peak employment of approximately 1,500 individuals. The Coalition expects that peak employment would occur between May 1 and October 30, during each year of construction. Most construction personnel would reside in their own personal residences or in existing commercial hotels and motels, but dedicated construction camps would be needed for some staff. Specifically, the Indian Canyon Alternative and Whitmore Park Alternative would each require one temporary construction camp for 30 to 40 people, and the Wells Draw Alternative would require two construction camps for 30 to 40 people and another construction camp for 200 people (Table 2-2).

Table 2-2. Temporary Housing Camps for Construction Staff

Action Alternative	Capacity (people)	Type of Construction	Size (acres)	Location (milepost)
Indian Canyon	30–40	Tunnel	5	35
Wells Draw	30–40	Tunnel	5	23
	30–40	Tunnel	5	36
	200	Embankments and bridges	8.5	57
Whitmore Park	30–40	Tunnel	5	40

2.1.7 Bridges, Culverts, and Stream Realignments

The proposed rail line and associated access roads and road relocations would require bridges and culverts to cross streams, rivers, and drainages, as well as existing roadways. Table 2-3 shows the number of bridges and culverts for each Action Alternative.

Table 2-3. Bridges and Culverts

Action Alternative	Rail Bridges	Road Bridges	Culverts
Indian Canyon	31	2	372
Wells Draw	33	3	496
Whitmore Park	30	1	423

Notes:

Bridges include Precast Prestressed Concrete Double Cell Box Beam Span, Rolled Steel Beam Span with Steel Pan Deck, Structural Steel Plate Arch, and other bridge types to be determined during final design.

Construction of the proposed rail line would require realignments of stream segments to accommodate permanent project features, including portions of the railbed and areas of cut and fill. Table 2-4 displays the number and length of stream realignments by Action Alternative.

Table 2-4. Stream Realignments per Action Alternative

Action Alternative	Number of Realignments	Stream Impact at Realignment Locations (miles)
Indian Canyon	59	3.9
Wells Draw	17	1.4
Whitmore Park	55	3.8

2.1.8 Tunnels

The proposed rail line would require tunnels to traverse the mountainous terrain surrounding the Basin. Drilling and blasting (i.e., "mine" construction methods) may be used in certain locations, depending on the length of the tunnel and the specific geological features at the tunnel locations. Tunnels over 1 mile long would likely require rock stabilization and ventilation features. Shorter tunnels may not require those features, depending on the specific geological features at the tunnel locations. The Coalition may install mechanical ventilation, such as jet fans mounted on the tunnel walls or ceilings, depending on the length and configuration of the tunnel. Table 2-5 displays the number and length of tunnels by Action Alternative.

Table 2-5. Tunnels

Action Alternative	Number of Tunnels	Total Length of Tunnels (miles)
Indian Canyon	3	4.3
Wells Draw	13	5.6
Whitmore Park	5	5.7

2.1.9 Grade Crossings

Table 2-6 shows the number of planned public and private road crossings for each Action Alternative. Paved public roadway crossings, if not grade-separated, would be equipped with active warning devices (bells, flashers, and gates) and constant warning time devices. Gravel and unsurfaced public roadway crossings and all private roadway crossings, if not grade-separated, would be equipped with passive warning devices (stop signs and crossbucks). The Coalition would

design grade-crossing warning devices to comply with the *Manual on Uniform Traffic Control Devices* (FHWA 2009) and applicable safety regulations.

Table 2-6. Number of Road Crossings per Action Alternative

Action Alternative	At-Grade	Grade-Separated	Total
Indian Canyon	53	17	70
Wells Draw	61	29	90
Whitmore Park	66	14	80

2.1.10 Road Relocations

Construction of the proposed rail line would result in the relocation of existing public and private roads. Table 2-7 shows the number of road relocations and the total length of relocations.

Table 2-7. Road Relocations per Action Alternative

Action Alternative	Number of Relocations	Total Length of Relocations (miles)
Indian Canyon	52	11.8
Wells Draw	65	13.7
Whitmore Park	71	13.8

2.1.11 Associated Facilities

2.1.11.1 Support Facilities

The Coalition does not anticipate constructing or operating stations along the proposed rail line. The Coalition expects that UP and BNSF Railway Company would conduct run-through operations on the proposed rail line and does not intend to construct locomotive repair shops, rail car repair shops, marshalling yards, or storage yards as part of the proposed rail line. Shippers could conduct mechanical inspections and repairs at potential shipper-owned facilities.

2.1.11.2 Siding Tracks and Set-Out Tracks

The proposed rail line would consist of a single main track with sidings to enable trains to meet and/or pass. Siding tracks would add 15 to 20 feet to the width of the track structure. Table 2-8 shows the estimated numbers and lengths of sidings for each Action Alternative. The Coalition would determine the exact locations of siding tracks during final design.

Table 2-8. Siding Tracks and Set-Out Tracks

Action Alternative	Number of Sidings	Total Length of Sidings (miles)	Range of Sidings (miles)
Indian Canyon	6	12.4	1.65–3.69
Wells Draw	3	5.2	1.64–1.85
Whitmore Park	9	18.0	1.65–3.69

2.1.11.3 Distribution Lines and Power

Power distribution lines would be needed for some signals, communications, and safety equipment. The Coalition would determine the exact locations of power distribution lines during detailed design following the conclusion of the Board's environmental review process. OEA anticipates that any needed power distribution lines would be constructed within the rail line footprint and would connect to existing lines where there are connections adjacent to the rail line footprint. In more remote or inaccessible locations, OEA anticipates that the Coalition would use solar-powered equipment. This would include any power needed for the communications towers and remote grade crossings requiring active warning devices.

2.1.11.4 Communications Towers

The proposed rail line would require the construction of permanent communications towers. Each tower site would be approximately 0.5 acre in area and approximately 120 feet high, though the exact height would depend on final design details. Each Action Alternative would require the construction of four communications towers. The Coalition would construct permanent access roads to provide access to the communications towers. These access roads would be approximately 13 feet wide and located within the rail line footprint.

2.1.12 Construction Schedule

The Coalition anticipates that construction of the Indian Canyon Alternative or the Whitmore Park Alternative would take approximately 2 years, but this time frame could range from 20 to 28 months depending on weather conditions. The Coalition expects that construction of the Wells Draw Alternative would take approximately 3 years, but could range from 32 to 48 months depending on weather conditions. The construction season would be different for the different components of the rail line.

Construction of the following features would occur year-round (12 months per year).

- Tunnels
- Bridges
- Signal and communications systems

Construction of the following components would be limited to an 8-month construction season each year, beginning in mid-April and ending in mid-November.

- Embankments (cuts and fills)
- Culverts
- Retaining walls

- Roadways and roadway crossings
- Track
- Fencing

2.2 Operations

Following construction of the proposed rail line, Rio Grande Pacific Corporation would operate the proposed rail line. The Coalition anticipates that shippers would primarily use the proposed rail line to transport crude oil using trains composed of 110 tank cars each, on average. The Coalition also expects that shippers could transport frac sand on the proposed rail line using frac sand trains composed of 110 cars each, on average. It is also possible that shippers would transport other commodities in rail cars that would be added to the oil trains or the frac sand trains. Each oil train and each frac sand train would be powered by approximately eight 4,300- to 4,400-horsepower locomotives.

Trains on the proposed rail line would operate at speeds allowable for Federal Railroad Administration (FRA) Class 3 tracks. The Coalition anticipates an average train speed of between 10 and 20 miles per hour. The maximum speed would not exceed the safe operating speed on FRA Class 3 tracks, which is 40 miles per hour for freight rail. Trains on the proposed rail line would operate 365 days per year, 24 hours per day, as permitted by weather conditions.

2.2.1 Rail Traffic

Depending on future market conditions, the Coalition estimates that between 672 and 1,809 loaded oil trains would leave the Basin per year using the proposed rail line. An equal number of empty oil trains would enter the Basin each year on the proposed rail line. These estimates correspond to a daily average of 3.68 to 9.92 loaded and empty oil trains on the proposed rail line. Each loaded oil train would include, on average, 110 tank cars and each tank car would contain, on average, approximately 642 barrels of crude oil. Therefore, the total volume of oil that would be transported on the proposed rail line would range from approximately 130,000 to approximately 350,000 barrels per day, on average. The actual volumes of oil that would move over the proposed rail line would depend on the demand for crude oil from the Basin, which is determined by global crude oil prices and capacity at oil refineries.

In addition, and also depending on future market conditions, the Coalition estimates that between 0 and 110 loaded frac sand trains would enter the Basin each year using the proposed rail line, to support oil mining in the Basin. An equal number of empty frac sand trains would leave the Basin each year on the proposed rail line. These estimates correspond to a daily average of 0 to 0.6 loaded and empty frac sand trains on the proposed rail line.

Including loaded and empty frac sand trains and unloaded and empty oil trains, the Coalition estimates that total rail traffic on the proposed rail line would range from 3.68 to 10.52 trains per day, on average. Shippers could also use the proposed rail line to transport other commodities, but the Coalition does not anticipate that the volume of those commodities would be large enough to support dedicated trains. Therefore, other commodities would be shipped in manifest rail cars attached to the oil trains and frac sand trains. The Coalition estimates that the number of manifest

rail cars added to the oil trains and frac sand trains would range from 24 carloads per day to 36 carloads per day, on average, including loaded and empty rail cars.

Because the rail traffic would depend on future market conditions that the Board does not control and that OEA cannot precisely predict, OEA defined two reasonably foreseeable scenarios for future rail traffic levels for the purposes of analysis in the EIS. The two scenarios correspond to the lowest and highest estimated rail traffic estimates. Under the high rail traffic scenario, 10.52 trains would move on the proposed rail line each day, on average. Under the low rail traffic scenario, 3.68 trains would move on the proposed rail line each day, on average.

2.2.2 Maintenance

OEA expects that the Coalition would construct the proposed rail line using new materials, which would initially require a minimal amount of maintenance. Maintenance activities on the tracks would include rail surfacing, ballast cleaning and tamping, and rail grinding. Other maintenance activities would include maintaining rail sensors; lubricating rails; replacing rail, ties, and ballast; and inspecting track. In addition, any tunnels would need regular inspections and maintenance.

2.2.3 Staffing

Operations and maintenance employment requirements would be similar for the Indian Canyon Alternative and Whitmore Park Alternative. Due to its longer length and the more difficult topography that it would cross, the Wells Draw Alternative would require a greater number of staff for operations and maintenance. Staffing requirements would also depend on the train traffic volume. Table 2-9 lists the operations and maintenance staffing requirements for each Action Alternative for the high rail traffic scenario and the low rail traffic scenario.

Table 2-9. Operations and Maintenance Staffing Requirements

	High Rail Traffic Scenario (10.52 trains per day)	Low Rail Traffic Scenario (3.68 trains per day)
Action Alternative	**Employees**	**Employees**
Indian Canyon	100	50
Wells Draw	120	65
Whitmore Park	100	50

Skilled labor and unskilled labor positions would include the following.

- Railroad operations employees, such as engineers, conductors, foremen, and train dispatchers.
- Maintenance-of-way employees, such as track maintainers, bridge maintainers, machine operators, truck drivers, signal and communications systems maintainers, and laborers.
- Mechanical employees, such as rail car and locomotive maintainers and inspectors (i.e., light repairs and replacement of consumables such as brake shoes) and laborers.

Management labor would consist of the following.

- Operations management, which would include supervision of train crews and direction of day-to-day operations.

- Engineering management, which would include supervision of track, bridge, and signal maintainers, and direction of day-to-day fixed infrastructure maintenance.
- Mechanical management, which would include supervision of locomotive and rail car maintainers and inspectors.
- General management and general office staff.

Table 2-10 shows the estimated percentages of the total operations and maintenance workforce by job type.

Table 2-10. Estimated Percentages of Total Operations and Maintenance Workforce by Job Type

Job Type	High Rail Traffic Scenario (%)	Low Rail Traffic Scenario (%)
Operations	60	45
Maintenance of Way	25	35
Mechanical	5	5
Management	10	15

OEA expects that the relative percentage of operations employees would be higher under the high rail traffic scenario. The relative percentages of maintenance-of-way and management employees would be higher under the low rail traffic scenario. The relative percentage of mechanical employees would be the same under both scenarios.

Chapter 3
Federally Listed Species in Action Area

3.1 Endangered Species Act Consultation History

The following lists the consultation history to date.

- **April 10, 2019.** OEA sent a letter to Utah USFWS Ecological Services Office in West Valley City, Utah, requesting preliminary comments on the proposed rail line and concurrence with OEA's preliminary list of federally listed species to consider for the proposed rail line.
- **August 1, 2019.** The U.S. Department of Interior's Office of Environmental Policy and Compliance responded to OEA's Notice of Intent (NOI) to prepare an EIS and provided comments on behalf of USFWS. USFWS concurred with OEA's list of federally listed species to consider and reminded OEA that it must consult with USFWS under ESA Section 7 should the proposed rail line affect federally listed species and/or designated critical habitat.
- **February 18, 2020.** OEA and ICF (OEA's third-party consultant) held a teleconference with USFWS Utah Ecological Services staff (Joseph Moore, Rita Reisor, George Weekley, and Kate Novak) to discuss the proposed rail line, federally listed species potentially affected by the proposed project, potential survey needs for federally listed species, and development of the BA.
- **May 21, 2020.** OEA and ICF held a teleconference with USFWS Utah Ecological Services staff (Joseph Moore, Rita Reisor, and Kate Novak) to discuss potential survey needs and methods for assessing federally listed plants, Mexican spotted owl, and Canada lynx.
- **June 10, 2020.** OEA and ICF held a teleconference with USFWS Utah Ecological Services staff (Joseph Moore, Rita Reisor, George Weekley, and Paul Abate) to follow up on the May 21, 2020 call to resolve issues related to fieldwork and BA content to adequately complete ESA Section 7 consultation.
- **September 1, 2020**. OEA provided a preliminary Draft BA and supporting information, including fieldwork reports prepared by the Coalition, to USFWS for review and comment.
- **September 14, 2020**. OEA and ICF held a teleconference with USFWS Utah Ecological Services staff (Joseph Moore, Rita Reisor, George Weekley, and Paul Abate) to review preliminary comments from USFWS on the Draft BA.
- **October 6, 2020.** OEA and ICF held a teleconference with USFWS Utah Ecological Services staff and U.S. Army Corps of Engineers (Corps) staff to coordinate Section 7 consultation for pending Board and Corps decisions related to the proposed rail line.
- **October 8, 2020.** OEA held a teleconference with USFWS and cooperating agencies participating in the Board's EIS process to review the content of the Draft BA and coordinate Section 7 consultation for all federal actions and decisions related to the proposed rail line.
- **October 21, 2020.** OEA held a teleconference with USFWS and cooperating agencies to discuss potential revisions to the Draft BA and coordinate Section 7 consultation for all federal actions and decisions related to the proposed rail line.

3.2 Action Area

The ESA regulations define the action area as all areas to be affected directly or indirectly by the proposed project and not merely the area immediately adjacent to the action. Therefore, the action area includes each Action Alternative's project footprint plus all areas surrounding the project footprint where construction or operations activities could potentially affect the environment, either directly, indirectly, or through interrelated or interdependent actions.

Specific action areas are defined for federally listed plants, fish, and wildlife, because not all impacts from construction and operations occur equally across these taxa. For example, noise can affect wildlife, but not plants.

The following lists the respective action area for plants, fish, and wildlife for each Action Alternative.

- **Plants.** The plant action area consists of a 1,000-foot-wide corridor along much of the rail centerline (500 feet on either side of the centerline). The action area is wider than 1,000 feet in a few areas where the project footprint would extend slightly further than 500 feet from the rail centerline. The action area also includes locations of communications towers and access roads to the towers, which consists of a 1,000-foot-wide corridor along access road centerlines and a 500-foot-wide buffer around communications towers. This part of the action area makes up only 2 percent (or less) of the action areas along the Action Alternatives.
- **Fish.** The fish action area would normally consist of streams and other surface waters in the project footprint and a limited distance upstream and downstream of the proposed rail line where potential water quality and hydrology impacts from construction and operations would affect fish and fish habitat. However, the federally listed fish species addressed in detail in this BA include the Upper Colorado River Basin Fish (Colorado pikeminnow, humpback chub, bonytail, and razorback sucker) (Table 3.1), which, based on USFWS consultation guidance (USFWS 2010), requires the action area to be concurrent with the Upper Colorado River Basin (where the Action Alternatives are located). The reason the action area is concurrent with the basin is to capture actions that propose to use surface or groundwater in the basin, which can deplete water in the basin and affect the species.
- **Wildlife.** The wildlife action area is the same as described for plants to account for wildlife habitat impacts (i.e., 1,000-foot-wide corridor), but also accounts for a noise disturbance area for train noise. This noise disturbance area is defined by the 100-A-weighted decibel (dBA) sound exposure level (SEL), the noise level at which studies have shown animals (domestic and wild) exhibit a response to train noise (FRA 2005). Based on noise modeling for the proposed rail line, the 100-dBA SEL is estimated to extend 350 feet from the rail line for wayside noise (locomotive engine and wheel on rail) and 460 feet for horn noise at grade crossings. The noise disturbance action area is subsumed by the 1,000 foot-wide-corridor.
    - Mexican spotted owl: the action area for Mexican spotted owl deviates from the wildlife action area based on consultations with USFWS biologists and USFWS survey protocols. For this species, an additional 0.5-mile buffer was added to the wildlife action area for survey protocol purposes.

3.3 Federally Listed Species Considered

The federally listed species considered is based on consultations with USFWS and the most recent species listings in the USFW Information for Planning and Consultation (IPaC) system for the action areas. This information revealed six threatened species and six endangered species as occurring or potentially occurring in the action areas, including one mammal, two birds, five fish and four plants (Table 3-1). Critical habitat is designated or proposed for all animal species, with critical habitat occurring in the action area for four fish species.

Table 3-1. Federally Listed Species that Occur or Potentially Occur in the Action Areas

ESA Listed Species	Scientific Name	Status	Designated Critical Habitat?/In Action Areas?
Mammals			
Canada lynx	*Lynx canadensis*	Threatened	Yes/No
Birds			
Mexican spotted owl	*Strix occidentalis lucida*	Threatened	Yes/No
Western yellow-billed cuckoo	*Coccyzus americanus*	Threatened	Proposed/No
Fish			
Colorado pikeminnow (=squawfish)[a]	*Ptychocheilus lucius*	Endangered	Yes/Yes[d]
Humback chub[a,b]	*Gila cypha*	Endangered	Yes/Yes[d]
Bonytail[a]	*Gila elegans*	Endangered	Yes/Yes[d]
Razorback sucker[a]	*Xyrauchen texanus*	Endangered	Yes/Yes[d]
June sucker	*Chasmistes liorus*	Endangered	Yes/No
Plants			
Barneby ridge-cress[c]	*Lepidium barnebyanum*	Endangered	No/NA
Pariette cactus	*Sclerocactus brevispinus*	Threatened	No/NA
Uinta Basin hookless cactus	*Sclerocactus wetlandicus*	Threatened	No/NA
Ute ladies'-tresses	*Spiranthes diluvialis*	Threatened	No/NA

Notes:

[a] These four federally listed fish species are collectively called Upper Colorado River Basin Fish.

[b] On January 22, 2020, USFWS proposed a rule to reclassify the humpback chub from endangered to threatened with a Section 4(f) rule (85 Federal Register 3586).

[c] The Barneby ridge-cress does not occur or potentially occur in the Wells Draw Alternative action area.

[d] While there is designated critical habitat in the action areas because the entire Upper Colorado River Basin is the action area for these species, there is no designated critical habitat along or near any of the Action Alternatives.

Source: U.S. Fish and Wildlife Service 2020a

NA=not applicable

3.3.1 Species Dismissed from Further Consideration

3.3.1.1 Western Yellow-billed Cuckoo

The threatened Western yellow-billed cuckoo was eliminated from further consideration because habitat surveys found no suitable habitat in the action areas. Western yellow-billed cuckoos prefer

to nest in patches of at least 25 acres of dense riparian forest with canopy cover of at least 50 percent in the overstory and understory, which does not occur in the action areas (Coalition 2020a). Consequently, the proposed project would have **No Effect** on the Western yellow-billed cuckoo.

3.3.1.2 June Sucker

The endangered June sucker was eliminated from further consideration because the fish is native only to Utah Lake and tributary rivers (used for spawning), which are outside of the action areas. Consequently, the proposed project would have **No Effect** on the June sucker.

Chapter 4
Methods

This chapter discusses the methods used to determine the current status and habitat use of federally listed species in the action areas. The methods and associated habitat suitability field work conducted along the Action Alternatives are based on OEA consultations with USFWS as part of ESA Section 7 consultation process. Field habitat surveys specific to Canada lynx, Upper Colorado River Basin Fish (Colorado pikeminnow, humpback chub, bonytail, and razorback sucker), Pariette cactus, and Uinta Basin hookless cactus were determined to not be necessary as information was collected during baseline biological resources surveys and/or sufficient habitat and species presence information is already available on these species to complete the ESA Section 7 process.

4.1 Literature Search and Consultation

OEA reviewed literature and data from various sources to document presence of federally listed species and habitats in the action areas. The following briefly summarizes the literature and agencies consulted for federally listed species; Section 4.3, *Species Descriptions and Occurrences*, provides more information on the species and full citations of information used.

- **Canada lynx.** OEA consulted with USFWS and U.S. Forest Service (Forest Service) biologists, obtained existing Canada lynx habitat Geographic Information System (GIS) data from the state of Utah and Forest Service, and reviewed literature on the species and its presence in the state of Utah and the action areas.
- **Mexican spotted owl.** OEA consulted with USFWS biologists, obtained existing Mexican spotted owl habitat GIS data from USFWS, and reviewed literature on species and its presence in the state of Utah.
- **Upper Colorado River Basin fish.** OEA consulted with USFWS biologists, reviewed USFWS literature on the species historical and current presence in the action areas, and obtained information from the Upper Colorado River Endangered Fish Recovery Program.
- **Barneby ridge-cress.** OEA consulted with USFWS biologists, reviewed USFWS species range GIS data, and reviewed literature on the species and its presence in the state of Utah.
- **Pariette cactus and Uinta Basin hookless cactus.** OEA consulted with USFWS biologists, obtained USFWS suitable habitat and core habitat GIS data, and reviewed literature on the species and its presence in the state of Utah.
- **Ute ladies'-tresses.** OEA consulted with USFWS biologists and reviewed literature on the species and its presence in the state of Utah.

In addition, the Coalition's consultant HDR-conducted baseline biological resources surveys in spring, summer, and fall of 2019 that provided additional information on the potential presence of federally listed species/habitats in the action areas, as well as some basis for development of the species specific habitat surveys that were conducted in 2020 for Mexican spotted owl, Barneby ridge-cress, and Ute ladies'-tresses (Section 4.2, *Habitat Suitability Surveys*).

4.2 Habitat Suitability Surveys

The Coalition's consultant HDR conducted habitat suitability surveys in 2020 for the Mexican spotted owl, Barneby ridge-cress, and Ute ladies'-tresses (Coalition 2020b, 2020c, 2020d). This section details the methods for each species; the full habitat suitability reports are available to the public on the Board's website (www.stb.gov) and the Board-sponsored project website (www.uintabasinrailwayeis.com).

4.2.1 Mexican Spotted Owl

4.2.1.1 Habitat Models

The USFWS Utah Ecological Services office uses two separate models to identify potential habitat for the Mexican spotted owl in Utah.

- The initial model (the "1997 model") was developed by Willey and Spotskey (1997) and predicted breeding habitat throughout Utah based on slope, aspect, ruggedness, and vegetation. This model was intended for use at broad scales across large landscapes and was not intended for use at finer spatial scales (USFWS 2012a; Willey 2002a as cited in Coalition 2020b).
- In 2000, another model (the "2000 model") was developed for use at multiple spatial scales (Willey and Spotskey 2000). This model incorporated data on slope, aspect, ruggedness, fine-scale vegetation, surface geology, soil moisture, and an index of surface temperature. The 2000 model identified suitable combinations of the input variables and buffered those locations by 0.5 mile.

Tests of the 2000 model using different techniques in different regions of Utah suggested that it was useful in identifying breeding habitat in canyon landscapes at fine scales (<1:100,000; Willey 2002b as cited in Coalition 2020b). However, it successfully identified only 4.3 percent of known nest sites (Lewis 2014), and land managers have found the 2000 model outputs to be unreliable. Subsequent attempts between 2000 and 2012 to improve the model had mixed results (USFWS 2012a). As described in Section 4.2.1.3, *Pre-Field Preparation*, and per USFWS guidance, biologists defined the action areas (i.e., survey area) based on the 1997 model. The 2000 model was more restricted but identified potential habitat throughout much of Indian Canyon, some of Argyle Canyon, and limited portions of Emma Park in and near the action areas. Lewis (2014) modeled Mexican spotted owl habitat throughout the portion of the Mexican Spotted Owl Colorado Plateau Ecological Management Unit (EMU) in Utah. Input variables included elevation, aspect, curvature, surface ratio, vegetation, and geology. The model output is a continuous scale of probability of occupancy. The model mapped potential habitat over a smaller area than the models used by USFWS but captured 60.6 and 77.7 percent of known nest sites compared to 55.3 and 4.3 percent by the 1997 and 2000 models, respectively (Lewis 2014). Despite improvements in accuracy as a result of advances in spatial data, this model is not widely used by wildlife managers to predict Mexican spotted owl habitat in Utah. Within the action areas, this model identified potential habitat in the Emma Park and Whitmore Park areas but predicted a low probability of occupancy. The highest probability was 0.31 on a scale from 0 to 0.93 (Lewis 2014).

4.2.1.2 Survey Areas

As described in Section 3.2, *Action Area*, the survey areas are concurrent with the action areas, and are defined as a 0.5-mile buffer along the Action Alternatives. Surveys were limited to those areas that fall within the USFWS 1997 habitat model. Survey areas covered a total of approximately 110 square miles (sq. mi.) (70,206 acres), including 39 sq. mi. (25,148 acres) in the Indian Canyon Alternative survey area, 64 sq. mi. (40,983 acres) in the Wells Draw Alternative survey area, and 50 sq. mi. (32,214 acres) in the Whitmore Park Alternative survey area. Figure 4-1 shows the survey areas for each of the three alternatives.

Pre-Field Preparation

USFWS (2002a) recommends that the 1997 model be used a "first-cut" analysis tool to identify potentially rugged areas that could provide suitable owl habitat. The 2000 model predicts the location of breeding and roosting habitat and, according to USFWS, locations identified in the 2000 model should receive a thorough field evaluation. USFWS also recommends that site-specific biological knowledge, field and peer reviews, and previously published information be used to evaluate habitat (USFWS 2002a). For this reason, the survey areas were defined by the 1997 model, which fully encompasses the 2000 model in the survey areas.

Steep terrain is one of the primary attributes of suitable Mexican spotted owl habitat. To help identify suitable habitat, the field biologist derived a surrogate for slope from digital elevation models (DEMs) of the survey areas. Five-meter autocorrelated DEMs were downloaded from the Utah Automated Geographic Reference Center (AGRC 2020 as cited in Coalition 2020b) and converted to a slope raster using the Slope tool in the 3D Analyst toolbox in Environmental Systems Research Institute (ESRI) ArcMap 10.7.1. The output was in degrees slope between 0 and 90. Slopes in excess of 45 degrees were overlaid with both the 1997 and 2000 models to help identify potential habitat. Tablets equipped with the ESRI data collection application Collector were prepared for use in both field navigation and data entry. The Collector application included data layers for aerial images, survey area boundaries, the 1997 and 2000 habitat models, and slopes in excess of 45 degrees. Figure 4-2 shows the overlay of each of these data layers plus the Lewis (2014) data layer, which was used to confirm field evaluations *a posteriori*.

4.2.1.3 Field Evaluation

Biologists familiar with Mexican spotted owl biology and habitat use conducted field evaluations between June 15 and 20, 2020. Both biologists had completed the USFWS Utah Mexican spotted owl training, and the lead biologist has previous experience conducting habitat evaluations and surveys in Utah.

Figure 4-1. Mexican Spotted Owl Survey Area

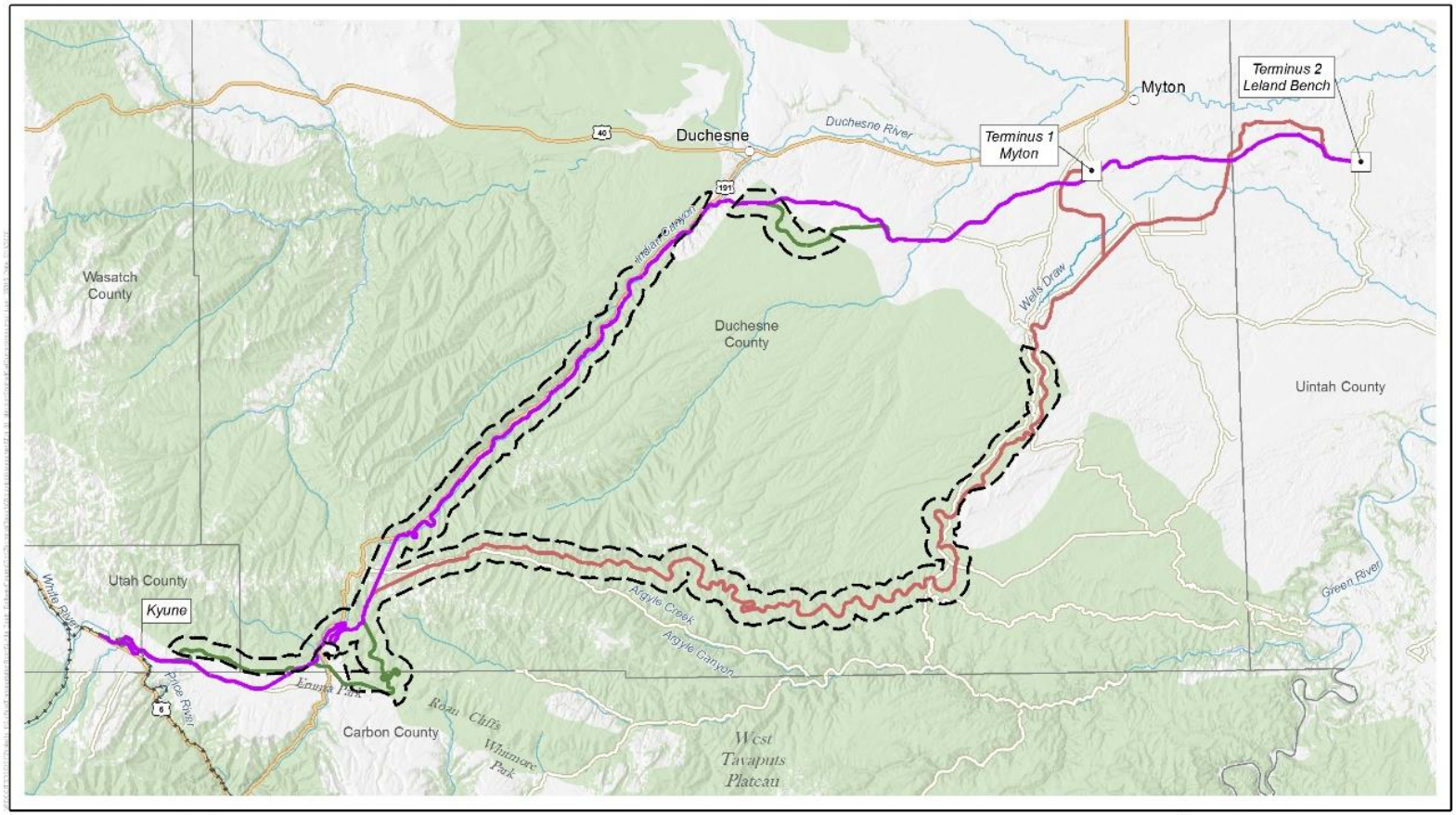
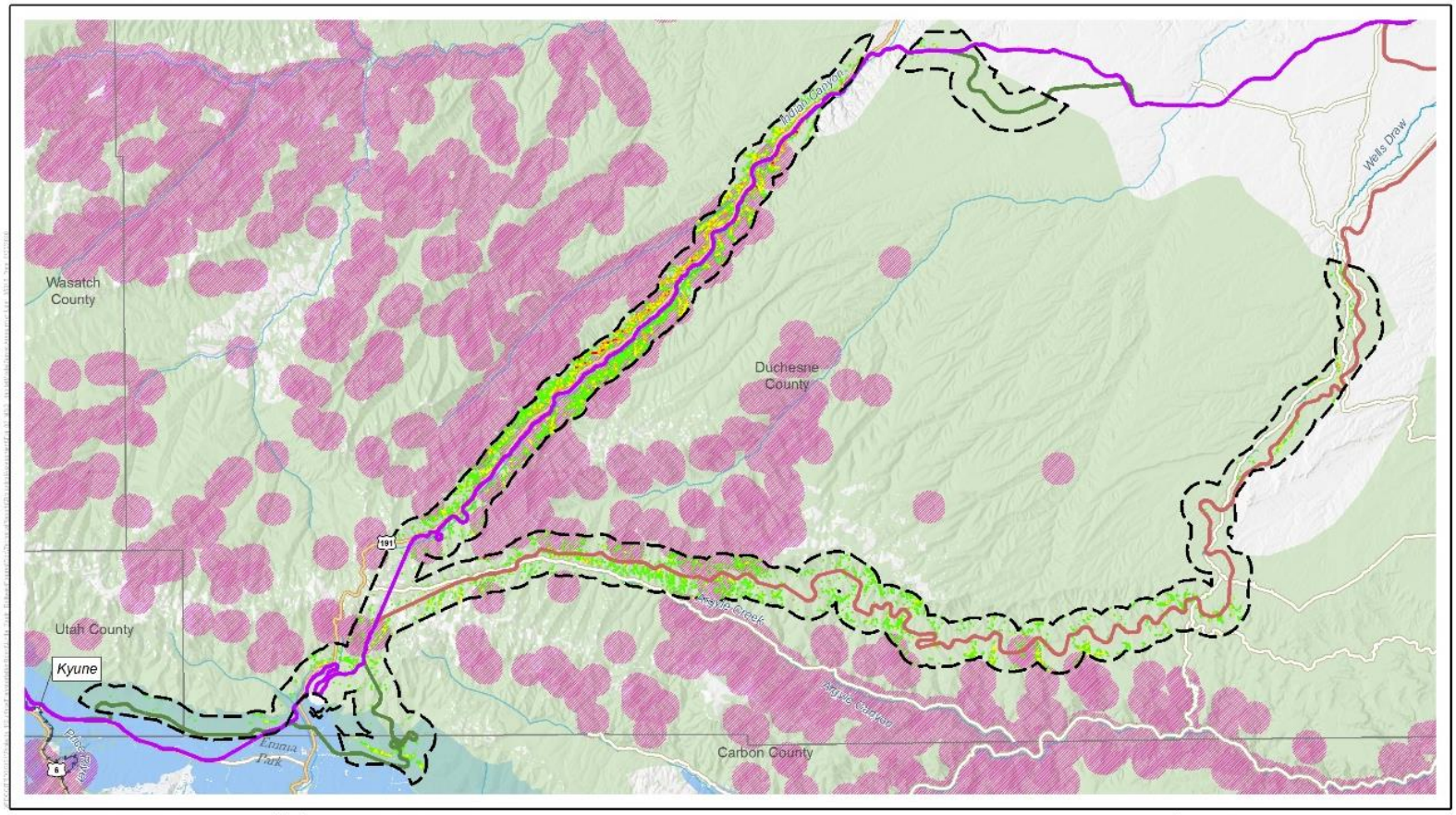


Figure 4-2. Mexican Spotted Owl Habitat Models



Biologists visually assessed all three of the survey areas and evaluated the habitat as high, moderate, or low quality for roosting and nesting Mexican spotted owls (Table 4-1). Biologists used Collector on a tablet to draw polygons around landscape features and link photographs and notes to those polygons. With few exceptions, all portions of the survey areas with steep slopes (>45 degrees) and all portions of the 2000 model located in the survey areas were photographed and assessed in detail. Other areas (those within the 1997 model but not in the 2000 model and not in areas with steep slopes) were first assessed visually and in more detail only if landscape characteristics indicated attributes of suitable habitat. Inaccessible areas were viewed through spotting scopes, and photographs were taken through the spotting scope lens. Areas beyond the survey areas were also evaluated as necessary to assess the length of canyons and the total area of potentially suitable habitat. In general, the characteristics shown in Table 4-1 were used to define high-, moderate-, or low-quality habitat. These characteristics were based on available literature, particularly USFWS (2012a) and Willey and Zambon (2014).

Table 4-1. Characteristics of High-, Moderate-, and Low-Quality Mexican Spotted Owl Habitat

Attribute	High Quality	Moderate Quality	Low Quality
Terrain steepness	Narrow, steep, incised canyon	Canyons with inconsistent cliff habitat	Talus/scree slopes, forested slopes, limited or no cliff habitat
Ruggedness	Tall cliffs with caves, crevices, and ledges	Short cliffs with limited caves, crevices, and ledges	Limited or no caves, crevices, and ledges
Area/extent	<2 km wide by >2 km long	Inconsistent or short canyon habitats	Open valley, exposed cliffs, short side canyons off wide valley
Temperature	Shaded areas, cool microclimates	Limited shade, limited vegetation	South exposure, open habitat, hot/dry microclimate
Vegetation	Late seral conditions and/or mesic vegetation	Limited vegetative cover, xeric vegetation	Limited vegetation, shrub/scrub habitats without trees
Litter/debris	Ample woody debris and litter	Limited woody debris and litter	No woody debris and limited litter
Hydrology	Perennial surface water present	Regularly occurring ephemeral or intermittent surface water	Irregular surface water or no surface water

Notes:
km = kilometers

4.2.2 Barneby Ridge-Cress

USFWS provided biologists with Barneby ridge-cress potentially suitable habitat GIS data (Moore 2019 as cited in Coalition 2020c) as a starting point in determining where to focus suitable habitat surveys. To identify suitable habitat in the action areas, biologists first overlaid USFWS' potentially suitable habitat GIS layer with the action areas. Figure 4-3 provides an overview map of the Action Alternatives and the USFWS-delineated potentially suitable habitat area. Once the potentially suitable habitat area was narrowed down to the action areas, high-quality aerial images (collected

by AeroGraphics from June to October 2019) were used to identify sites that appeared white, thus representing the white limestone shale habitat preferred by Barneby ridge-cress (Section 4.3.4, *Barneby ridge-cress*). Biologists prepared tablets equipped with the Collector application for use in both field navigation and data entry. The Collector application included data layers for aerial images, action area boundaries, the USFWS potential habitat polygon, and the refined white areas identified on desktop computers. Biologists then visually inspected sites both within the USFWS potential habitat polygon, as well as areas determined to be white through aerial images to confirm whether sites displayed characteristics consistent with the description of Barneby ridge-cress habitat. Field evaluation was conducted on July 17, 2020. Following the field evaluation, biologists used the field data to further refine and digitize areas of potentially suitable habitat in the action areas.

4.2.2.1 Ute Ladies'-Tresses

Biologists used habitat, wetlands, and stream information collected in spring, summer, and fall 2019 as part of the proposed rail line's biological resources baseline surveys (Coalition 2020a) and wetland and stream delineation surveys (Coalition 2020e) as a starting point in determining where to focus suitable habitat surveys. Next, action areas above 7,000 feet in elevation were excluded from further review because the species is not known to occur above that elevation and USFWS survey protocols do not require surveys above this elevation. After narrowing the action areas to below 7,000 feet, biologist used GIS software to develop potentially suitable habitat polygons for the species along the action areas based on data collected in the aforementioned biological resources baseline and wetlands and stream delineation surveys. These polygons included riparian areas, as well as areas along water courses and in wet meadows where vegetation is not overly dense. Figure 4-4 provides an overview map of the action areas (the areas below 7,000 feet are highlighted; note the size of the action areas are exaggerated so they are visible at the map scale). Biologists then prepared tablets equipped with Collector for use in both field navigation and data entry. The Collector application included data layers for aerial images, action area boundaries, and potentially suitable habitat polygons for Ute ladies'-tresses that were developed on desktop computers. Biologists then visually inspected all riparian, wetland, and mesic areas identified below 7,000 feet in elevation in action areas to confirm whether these areas displayed characteristics consistent with the description of Ute ladies'-tresses suitable habitat in. Field surveys were conducted between June 22 and July 1, 2020. Following the field survey, biologists used the field data to digitize areas of suitable habitat in the action areas.

Figure 4-3. Barneby Ridge-Cress Potentially Suitable Habitat

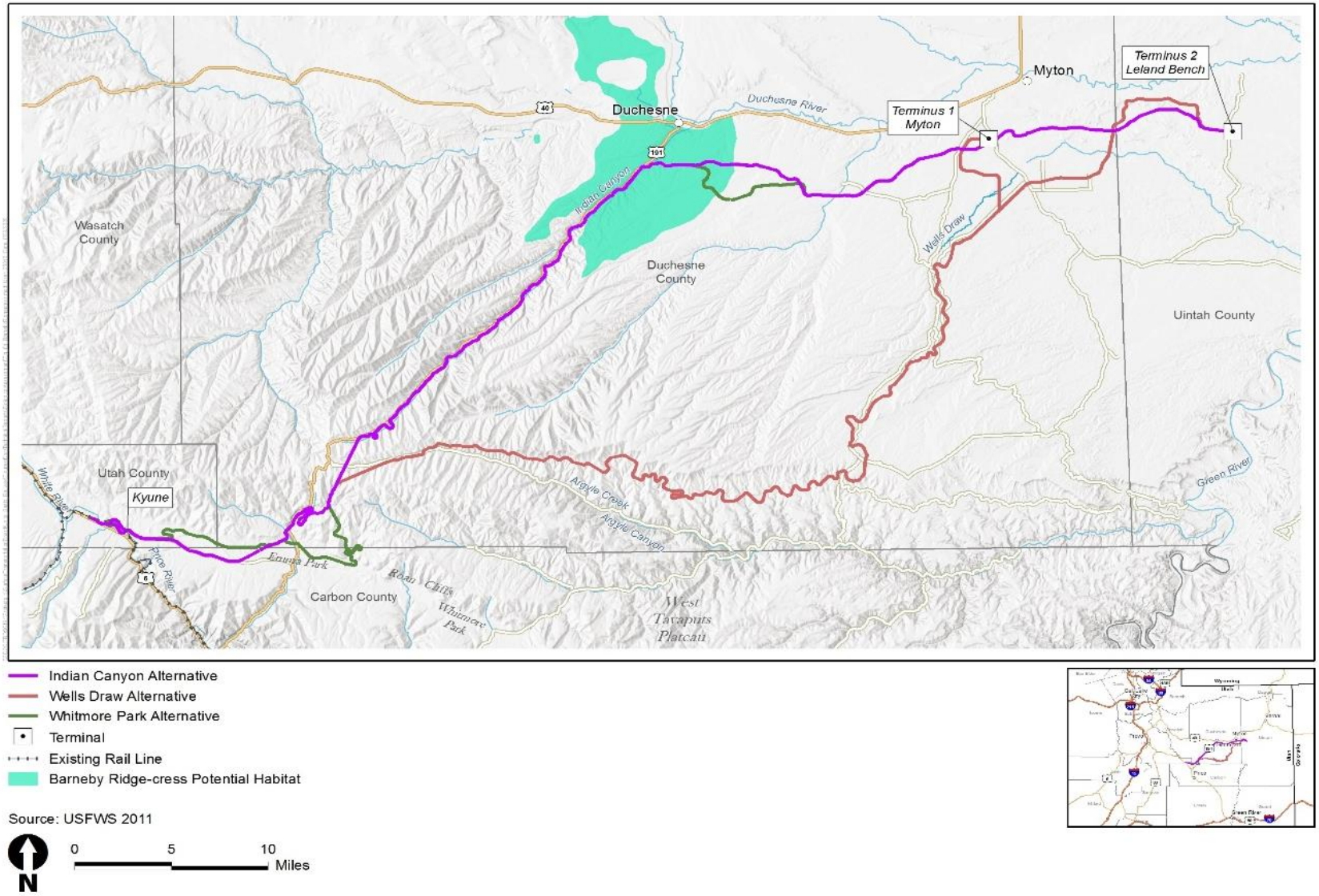
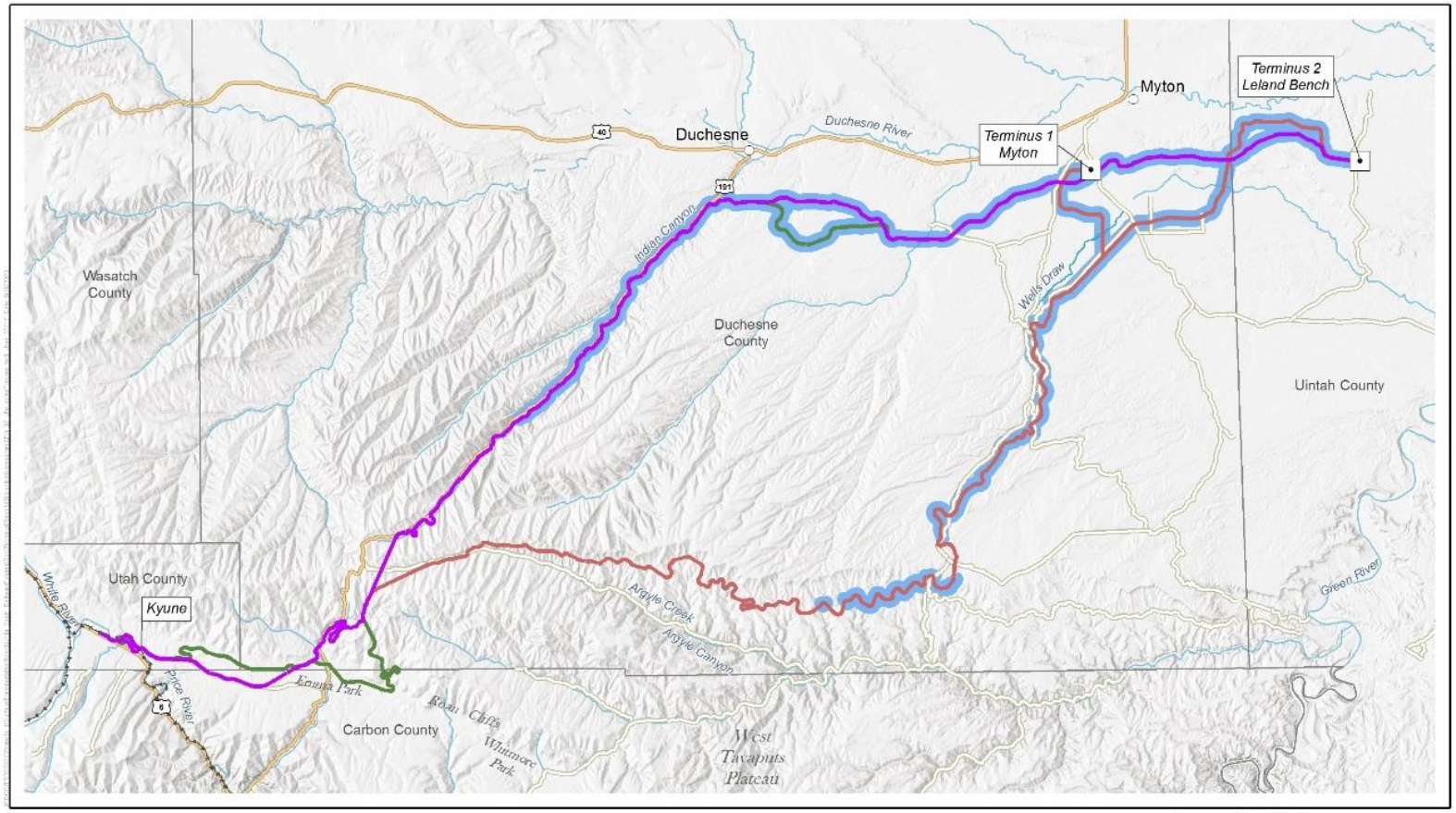


Figure 4-4. Ute Ladies'-Tresses Action Areas



Note that for sites below 7,000 feet, the following habitat types do not qualify as Ute ladies'-tresses habitat per USFWS' interim survey requirements (USFWS 1992).

- Sites that are highly disturbed or modified such as highway rights-of-way built on compacted soils or rock fill; rock or soil fills with steep back slopes; active construction sites; landscaped bluegrass lawns.
- Upland sites.
- Sites entirely inundated by standing water.
- Sites composed entirely of heavy clay soils.
- Very saline sites such as dense monospecific stands of saltgrass (*Distichlis spicata*).

Sites composed entirely of dense stands of reed canary grass (*Phalaris arundinacea*), tamarisk (*Tamarix* species), greasewood (*Sarcobatus vermiculatus*), teasel (*Dipsacus sylvestris*), or common reed (*Phragmites australis*).

4.3 Species Descriptions and Occurrences

4.3.1 Canada Lynx

The Canada lynx (*Lynx canadensis*) was listed as threatened under the ESA on March 24, 2000 (65 Federal Register [FR] 16053). The Canada lynx is a medium-sized cat with long legs, large, well-furred paws, long tufts on the ears, and a short, black-tipped tail. The winter pelage of the Canada lynx is dense and has a grizzled appearance with grayish-brown mixed with buff or pale brown fur on the back, and grayish-white or buff-white fur on the belly, legs, and feet. Summer pelage of the Canada lynx is more reddish to gray-brown. Adult males average 10 kilograms in weight and 85 centimeters in length (head to tail), and females average 8.5 kilograms and 82 centimeters. The Canada lynx's long legs and large feet make it highly adapted for hunting in deep snow.

The distribution of Canada lynx in North America is closely associated with the distribution of North American boreal forest, where individuals maintain large home ranges (between 12 and 83 square miles) (USFWS 2005). In Canada and Alaska, Canada lynx inhabit the classic boreal forest ecosystem known as the taiga. The range of Canada lynx populations extends south from the classic boreal forest zone into the subalpine forest of the western United States, and the boreal/hardwood forest ecotone in the eastern United States. Forests with boreal features extend south into the contiguous United States along the North Cascade and Rocky Mountain Ranges in the west, the western Great Lakes Region, and northern Maine. Within these general forest types, Canada lynx are most likely to live in areas that receive deep snow and have high-density populations of snowshoe hares, the principal prey of Canada lynx. Canada lynx are highly mobile and can disperse over long distances, especially when prey becomes scarce(USFWS Undated).

USFWS designated critical habitat for Canada lynx on November 9, 2006 (71 FR 66008). The critical habitat designation has been revised twice, most recently with the publication of a final rule on September 12, 2014 (79 FR 54781). The critical habitat areas designated in this rule constitute the best assessment of the areas that meet the definition of critical habitat for Canada lynx in the contiguous United States and include 38,954 square miles of critical habitat in five units in Idaho,

Maine, Minnesota, Montana, Washington, and Wyoming. There is no designated critical lynx habitat in Utah (79 FR 54781).

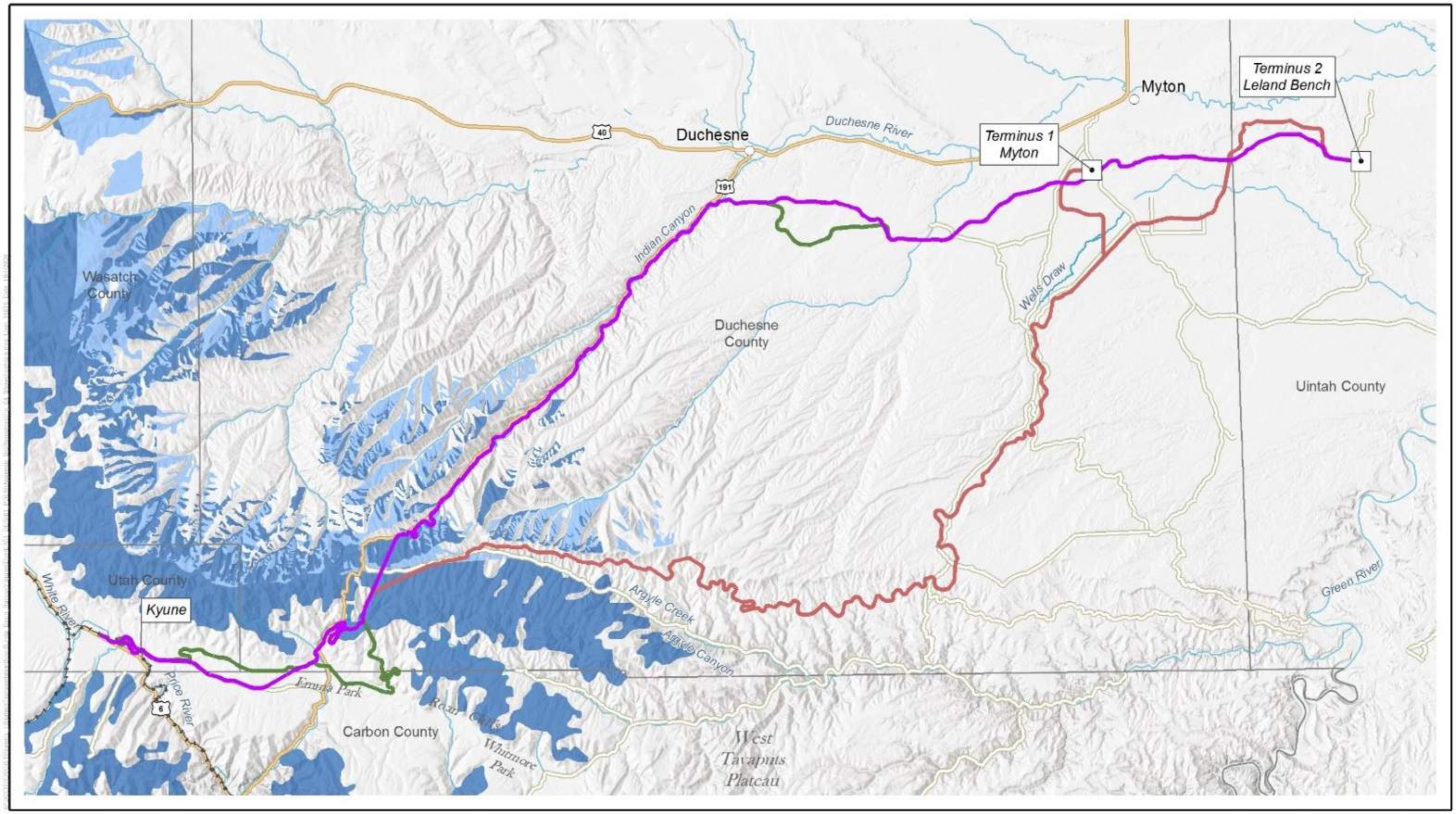
The USFWS Recovery Outline (USFWS 2005) concluded that Canada lynx threats include timber harvest activities, such as precommercial thinning, that reduce the quality of snowshoe hare habitat in some areas in the southern Rocky Mountains. Climate change is expected to adversely affect lynx populations because models have predicted an overall decline in persistent snow of 40 percent. In recent years, an extensive mountain pine beetle epidemic has caused significant mortality of mature lodgepole pine forests, one of the habitats lynx use. Vehicular collisions are also a potentially important cause of mortality.

4.3.1.1 Canada Lynx in the Action Area

Potentially suitable Canada lynx habitat exists in the action areas for all three Action Alternatives, primarily at the higher elevations of Ashley National Forest around Indian Canyon and Argyle Canyon. Snowshoe hare (primary food of the Canada lynx) is extensive in this area and can indicate potentially suitable habitat (Figure 4-5). However, detailed Canada lynx habitat mapping conducted by the Forest Service found Canada lynx habitat in the action areas to be much more limited, and marginal at best. Forest Service Canada lynx habitat mapping in a 2002 GIS dataset shows approximately 122 acres of Canada lynx habitat in the Indian Canyon Alternative and Whitmore Park Alternative action areas (Forest Service 2002); however, this habitat is above the three mile tunnel that crosses under the southern boundary of Ashley National Forest, where no surface disturbance would occur. In addition, this habitat is considered marginal and is disjunct from any typical Canada lynx habitat (Christensen pers. comm.).

The Forest Service also mapped Canada lynx habitat on Ashley National Forest in the form of Lynx Analysis Units (LAU) at the direction of the Canada Lynx Conservation Assessment Strategy (LCAS) (Forest Service 2000a). LAUs approximate the size of a female's home range and contain year-round habitat components. Females have smaller home ranges than males and are more restricted in their movements during the period of kitten dependency. Maintaining good quality and distribution of denning and foraging resources within an LAU helps to assure survival and reproduction by adult females, which is critical to sustain the overall lynx population. A sufficient amount of Canada lynx habitat must be present within the LAU to support a female lynx (Interagency Lynx Biology Team 2013). The Forest Service, when revising the LAUs after the most recent LCAS in 2013, found that no habitat in Ashley National Forest in or around the action areas met this definition and, therefore, did not map any LAUs in Ashley National Forest where the Action Alternatives are located. This means that Ashley National Forest in this area is unoccupied Canada lynx habitat, is considered peripheral Canada lynx habitat, and is not considered to contain Canada lynx habitat sufficient to support a breeding female. In addition, there are no historic Canada lynx locations anywhere in or around the action areas in Ashley National Forest (Christensen pers. comm.). Further, Utah has not historically and does not currently support resident lynx populations because the habitat in the state is naturally incapable of supporting persistent populations; historical and future occurrences in Utah most likely represent occasional dispersing lynx (USFWS 2017a). Overall, Canada lynx habitat in the action areas is marginal at best, and the presence of Canada lynx would be extremely rare.

Figure 4-5. Snowshoe Hare Habitat



4.3.2 Mexican Spotted Owl

Mexican spotted owl (*Strix occidentalis lucida*) was listed as threatened under the ESA on March 16, 1993 (58 FR 14248). It is one of three subspecies of spotted owl recognized by the American Ornithologists' Union (AOU 1998). The other two subspecies are the northern spotted owl (*Strix occidentalis caurina*) and the California spotted owl (*Strix occidentalis occidentalis*); the Mexican subspecies is geographically isolated from both the northern and California subspecies. Mexican spotted owl is a medium-sized owl without ear tufts that is mottled in appearance, with irregular white spots on a brown abdomen, back, and head; the spots are larger and more numerous than in the other two subspecies, giving it a lighter appearance. Unlike most owl in North America, Mexican spotted owl has dark eyes (USFWS 2012a). Adult male and female Mexican spotted owls are similar in appearance; however, females are larger on average than males and can be further distinguished by their vocalizations. Juvenile owl (up to 5 months) have a downy appearance, whereas subadult owls (5 to 26 months) closely resemble adults, with the exception of pointed tail feathers and a pure white terminal band (USFWS 2012a).

Mexican spotted owls are nonmigratory and occupy a variety of habitats in different parts of their range, habitats including various forest types and steep rocky canyons, this last habitat being the primary habitat used in Utah. These owls are basically intolerant of even-age forest management practices, and forests used for roosting and nesting often contain mature or old-growth stands with a complex structure. They require cool summer roosts, such as near canyon bottoms, in dense forests, on shady cliffs, or in caves. Mexican spotted owls do not build their own nests but use suitable naturally occurring sites and nests built by other animals. Nests are either in trees (typically large Douglas-fir), in trunk cavities, or on cliffs. Mexican spotted owls typically locate prey from an elevated perch by sight or sound, and then pounce on the prey, capturing it with their talons. The species has been observed capturing ground prey, such as wood rats, mice, voles, rabbits, gophers, and reptiles, and flying prey, such as bats, birds, and insects. They hunt primarily at night, although infrequent diurnal foraging has been documented (USFWS 2012a). Mexican spotted owls are found throughout much of Utah, Colorado, Arizona, New Mexico, and parts of western Texas, as well as several states in Mexico. Although the subspecies occupies a large geographic area, occurrence is highly disjunct and dependent on specific montane forest and canyon habitat requirements. Most Mexican spotted owls are found on National Forest System land, but in the rocky, canyon habitat of the Colorado Plateau, most are found on land administered by BLM or the National Park Service (USFWS 2012a).

The range of Mexican spotted owls in the United States is divided among five ecological management units (EMU): the Colorado Plateau, Upper Gila Mountains, Basin and Range East, Basin and Range West, and Southern Rocky Mountain EMUs. Despite being the largest EMU, only about 16 percent of known territories are located in the Colorado Plateau EMU (in which the Action Alternatives are located). The majority of nest sites (52 percent) are located in the Upper Gila Mountains EMU located north and east of Phoenix, Arizona. Few nest sites are known to exist in northeastern Utah (north of Moab): two nests are located near the Green River in northeast Emery County, and one nest was identified in northwest Colorado, just across the border from Uintah County, Utah. Despite an apparent prevalence of suitable habitat for Mexican spotted owls in northeastern Utah, it appears that occupancy rates are low relative to the southern parts of their range (USFWS 2012a).

USFWS designated critical habitat for Mexican spotted owl on September 30, 2004 (69 FR 53182). This critical habitat designation includes approximately 8.6 million acres of federal lands in Arizona, Colorado, New Mexico, and Utah.

Primary threats to Mexican spotted owl include timber harvest practices that are incompatible with Mexican spotted owl habitat requirements, predation, and wildland fires (USFWS 2012a), as well as recreation, habitat loss and fragmentation, oil and gas exploration and development, and road improvement and development within canyons (USFWS 1995a). Livestock and wild ungulate grazing is widespread throughout the Mexican spotted owl range and may have an adverse effect on the availability of grass cover for prey species (USFWS 2013). Common mortality factors for Mexican spotted owl include predation from avian predators; starvation; road fatalities; collisions with powerlines, trees, or other obstacles; and human disturbance, such as incompatible timber harvesting, catastrophic wildfire, grazing, recreation, and other land uses (USFWS 2012a). Disease and predation have also emerged as a threat to the species (USFWS 2012a).

4.3.2.1 Mexican Spotted Owl in the Action Area

The Utah Natural Heritage Program database does not contain any known observations of Mexican spotted owl in the action areas or within a 2-mile buffer of the Action Alternatives (UDWR 2019); however, absence in this database means they have not been observed and does not indicate a definitive statement on species absence. Biologist identified potentially suitable habitat in the action areas during habitat suitability surveys. Approximately 294 acres of moderate-quality Mexican spotted owl nesting and roosting habitat were identified in the Wells Draw Alternative action area in a few spots along Argyle Canyon, all on BLM-administered lands (Table 4-2, Figure 4-6). All other portions of the three action areas were determined to be low quality; no high-quality habitat was identified in the action areas.

Table 4-2. Mexican Spotted Owl Habitat in Action Areas (acres)

Action Alternative	Low Quality	Moderate Quality[a]	High Quality
Indian Canyon Alternative	25,148	0	0
Wells Draw Alternative	40,983	294	0
Whitmore Park Alternative	32,214	0	0

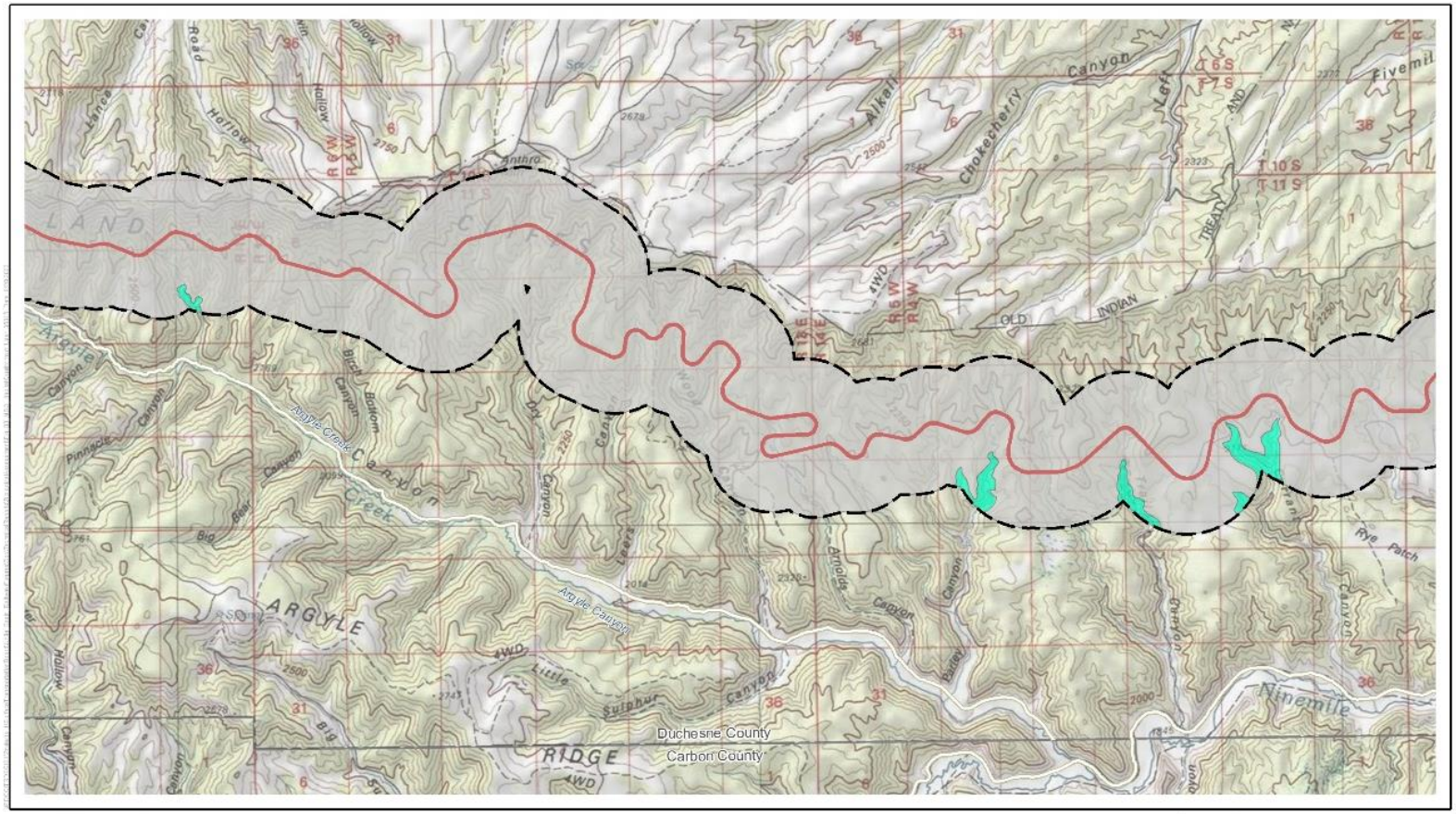
Notes:

[a] Note that both low and moderate quality habitat include areas that the 1997 Willey-Spotskey model (intended for broad scales across large landscapes) identified as prime breeding areas, as well as areas that the model identified as marginal habitat.

Source: Coalition 2020b

Low-quality habitat includes areas with habitat characteristics listed in the Low-Quality column in Table 4-1, and areas with no suitable habitat characteristics (nonhabitat). Because both low-quality habitat and nonhabitat areas were included in the USFWS 1997 model, they are both denoted as low quality in this BA. Low-quality habitat lacks most of the known characteristics of suitable nesting habitat and lacks most or all of the critical habitat primary constituent elements. For this reason, low-quality habitat in the action areas is unlikely to be used by Mexican spotted owls for nesting or foraging.

Figure 4-6. Mexican Spotted Owl Moderate-Quality Habitat in the Wells Draw Alternative Action Area



Moderate-quality habitat meets the criteria listed in Table 4-1 and has a moderate probability of occupancy by nesting and foraging Mexican spotted owls. These areas of moderate-quality habitat are small and isolated from known nesting habitat. This lack of connectivity likely reduces the probability of occupancy in areas identified as moderate quality in the survey areas.

The action areas can be divided into four general regions with differing geologic and vegetation characteristics. The general vicinity of these regions can be seen in Figure 4 of the Mexican spotted owl habitat suitability survey report and includes Argyle Canyon, Indian Canyon, Wells Draw, and Emma Park (Coalition 2020b). The results of the habitat evaluation in Argyle Canyon where moderate-quality habitat was mapped are summarized below; summaries for the remaining regions can be found in the Mexican spotted owl habitat suitability survey report (Coalition 2020b).

Figure 4-7. Moderate-Quality Habitat (Unnamed Canyon)

Only the Wells Draw Alternative traverses through and near Argyle Canyon. After emerging from a proposed tunnel, the alternative traverses the Bad Land Cliffs above Argyle Canyon until it reaches Wells Draw. Throughout much of this region, there is a bench below the Bad Land Cliffs that terminates in sandstone cliffs and relatively short side canyons (most less than 2 miles long) that run south to Argyle Canyon. Although many of these side canyons exhibit suitable habitat characteristics, they are generally short (less than 0.5 mile long), and Argyle Canyon proper does not contain sufficient cliff habitat to be considered moderate-quality habitat. One exception is an unnamed side canyon opposite Pinnacle Canyon that is about 0.75 mile long and exhibits moderate-quality characteristics (Figure 4-7). The upper 0.25 mile of this side canyon is within the action area and is mapped as moderate quality (Figure 4-6).

Figure 4-8. Moderate-Quality Habitat (Parley Canyon)

Near the confluence of Argyle Canyon and Ninemile Canyon, Parley Canyon exhibits sufficient cliff habitat and vegetation, and is of sufficient length, to be considered moderate quality (Figure 4-8). In addition, Trail Canyon and Currant Canyon, which are tributaries to Ninemile Canyon, also exhibit similar characteristics. The upper reaches of these tributary canyons are located within the survey area and are mapped as moderate quality (Figure 4-6). Most of Argyle and Ninemile Canyons are included in the 2000 model, but very little of the Wells Draw Alternative survey area in this region is included in the 2000 model.

4.3.3 Upper Colorado River Basin Fish (Colorado Pikeminnow, Humpback Chub, Bonytail, Razorback Sucker)

The Upper Colorado River Basin Fish comprise four endangered fish species that were once found throughout the Colorado River System. Table 4-3 provides a brief description of each species. The

information in this section is primarily based on information from the Upper Colorado River Endangered Fish Recovery Program (https://coloradoriverrecovery.org/).

Table 4-3. Upper Colorado River Basin Fish

Species	Species Description
Colorado pikeminnow (*Ptychocheilus lucius*)	A large-river minnow found only in the Colorado River Basin. Valued as food by early settlers and miners throughout the basin, wild populations now only occur in rivers upstream of Glen Canyon Dam, Arizona. Individuals may reach 6 feet in length, weigh 80 pounds, and live 40 years. Known for long-distance spawning migrations of up to 200 miles in late spring and early summer, adults are capable of reproducing at 5 to 7 years of age. Young fish feed on insects and plankton, whereas adults feed mostly on fish. The species was first listed as endangered on March 11, 1967 under the Endangered Species Preservation Act (32 FR 4001) and was given full protection under the Endangered Species Act in 1973. Critical habitat was designated on March 21, 1992 (59 FR 13374).
Humpback chub (*Gila cypha*)	A large-river minnow found only in canyon sections of the Colorado River Basin. There are six known populations. Individuals may reach 20 inches in length and live 30 years. Adults are capable of reproducing at 2 to 3 years of age, and spawning occurs in spring and early summer. Humpback chub feed on insects, plankton, and plant matter. The species was first listed as endangered on March 11, 1967 under the Endangered Species Preservation Act (32 FR 4001) and was given full protection under the Endangered Species Act in 1973. Critical habitat was designated on March 21, 1992 (59 FR 13374).
Bonytail (*Gila elegans*)	A large-river minnow found only in the Colorado River Basin. Historically common throughout the Colorado River Basin, wild populations no longer exist. Individuals may reach 22 inches in length and live 50 years. Adults are capable of reproducing at 2 to 3 years of age, and spawning probably occurred in spring and early summer. Bonytail feed on insects, plankton, and plant matter. The species is being reintroduced into the Colorado, Green, and Yampa Rivers, and into Lake Havasu and Lake Mojave. The species was listed as endangered under the Endangered Species Act on April 23, 1980 (45 FR 27710). Critical habitat was designated on March 21, 1992 (59 FR 13374).
Razorback sucker (*Xyrauchen texanus*)	A large-river fish found only in the Colorado River Basin. Valued as food by early settlers and miners, wild populations of razorback sucker are now extremely rare, declining, and consist primarily of adults. Poor survival of young has been attributed to loss of habitat and predation by nonnative fishes. Individuals may reach 36 inches in length, weigh 14 pounds, and live 40 years. Adults are capable of reproducing at 3 to 4 years of age, and spawning occurs during high spring flows. Razorback sucker feed on insects, plankton, and plant matter. The species is being reintroduced into the Colorado, Gunnison, Green, and San Juan rivers, and lakes Havasu and Mohave. The species was listed as endangered under the Endangered Species Act on October 23, 1991 (56 FR 54597). Critical habitat was designated on March 21, 1992 (59 FR 13374).

Notes:
Source: Upper Colorado River Endangered Fish Recovery Program Undated

Colorado pikeminnow were once abundant in the main stem of the Colorado River and most of its major tributaries in Colorado, Wyoming, Utah, New Mexico, Arizona, Nevada and California. Today, two wild populations of Colorado pikeminnow are found in the Upper Colorado River Basin: one in

the upper Colorado River system and one in the Green River system. The San Juan River Basin Recovery Implementation Program continues to stock Colorado pikeminnow to develop a separate, self-sustaining population. The primary threats to Colorado pikeminnow populations are streamflow regulation and habitat modification (including cold-water dam releases, habitat loss, and blockage of migration corridors); competition with and predation by nonnative fish species; and pesticides and pollutants (USFWS 2002b).

Humpback chub historically inhabited the swift and turbulent waters in canyons of the Colorado River and three of its tributaries: the Green and Yampa rivers in Colorado and Utah, and the Little Colorado River in Arizona. The species was first discovered in 1946. Today, four self-sustaining populations of humpback chub occur in the Upper Colorado River Basin. About 2,000 to 3,000 adults can occur in the Black Rocks and Westwater Canyon core population in the Colorado River near the Colorado/Utah border. More than 1,000 adults occur in the Desolation/Gray Canyon core population in the Green River. The population in Cataract Canyon is small, consisting of up to a few hundred adults. The largest known population of humpback chub is in the Lower Colorado River Basin in the Grand Canyon, primarily in the basin and its confluence with the main stem of the Little Colorado River. In 2009, the U.S. Geological Survey (USGS) announced that this population increased by about 50 percent from 2001 to 2008. The agency estimates that the number of adults is currently around 12,000 fish. Loss of habitat extent and connectivity, persistent drought, and the introduction of nonnative fishes have had profoundly negative effects on humpback chub. Water development, with its resulting reduced water availability, changes in water temperature, and altered flow regimes, and the expanding presence of competitive and predatory nonnative fishes threaten the long-term viability of the species (USFWS 2017b).

Bonytail were once common in portions of the Upper and Lower Colorado River Basins. Today, the bonytail is among North America's most endangered fish species. Its distribution and numbers are so low that it is threatened with extinction. No reproducing populations are known in the wild. Recognizing that fewer bonytail were being seen in the Colorado River and no young, biologists captured 34 adults from Lake Mohave (Lower Colorado River Basin) from 1976 to 1988, and 16 from 1988 to 1989, to be held in fish hatcheries. The young of these Lake Mojave fish, and the few remaining adults in hatcheries and in the wild, make up the entire known population of bonytail in the world. Because there were so few bonytail in existence when recovery efforts began, their preferred habitat is still unknown. Their large fins and streamlined body enable bonytail to swim in swift river flows. Through research and monitoring of stocked fish, researchers continue to gain information to help determine this species' life-history needs and ways to improve their survival. Threats to the species include streamflow regulation, habitat modification, competition with and predation by nonnative fish species, hybridization, and pesticides and pollutants (USFWS 2002c).

The razorback sucker historically was widespread and abundant in the Colorado River and its tributaries. Today all populations of razorback sucker are supplemented with stocked fish except for the Lake Mead population. Lakes Mead and Mohave, both in the Lower Colorado River Basin. are the only population with wild fish. Threats to the species include streamflow regulation, habitat modification, competition with and predation by nonnative fish species, and pesticides and pollutants (USFWS 2002d).

4.3.3.1 Upper Colorado River Basin Fish in the Action Area

There is no suitable aquatic habitat for Upper Colorado River Basin Fish in the action area along any of the Action Alternatives. Indian Canyon Creek is located along the Indian Canyon Alternative and

Whitmore Park Alternative and eventually drains in the Duchesne River, which is a tributary of the Green River. Argyle Creek is located along the Wells Draw Alternative, and Willow Creek and the Price River are located along all Action Alternatives. All of these waterways ultimately drain to the Green River. Known species occurrences and suitable habitat are downstream of each Action Alternative, but at a distance beyond where the Action Alternatives' direct effects would reach.

With the exception of Price River, none of the streams crossed or in the vicinity of the Action Alternatives currently support or are known to be occupied by any of the Upper Colorado River Basin Fish (Coalition 2020a; USFWS 2017b, 2002b, 2002c, 2002d). The Action Alternatives cross the Price River near Colton, Utah, and the lower 143 kilometers of the Price River above the confluence with the Green River is known to support Colorado pikeminnow. However, this area of the Price River that supports Colorado pikeminnow is greater than 55 kilometers (35 miles) downstream of where the Action Alternatives cross the Price River. The lower 10 kilometers of the Duchesne River above the confluence of the Green River is known to support razorback sucker and Colorado pikeminnow (USFWS 2002b, 2002d). However, none of the Action Alternatives cross the Duchesne River, and the nearest point at which any Action Alternative is to the Duchesne River (Well Draw Alternative at just over 0.5 mile away) is 40 kilometers (25 miles) upstream of the lower 10 kilometers of the Duchesne River.

4.3.4 Barneby Ridge-Cress

The Barneby ridge-cress (*Lepidium barnebyanum*) is a perennial, herbaceous plant that was listed as endangered under the ESA on September 28, 1990 (55 FR 39860). It is approximately 5 to 15 centimeters (cm) (2 to 6 inches) tall and usually forms raised clumps or cushions up to 20 cm (8 inches) wide. The species arises from a deep woody taproot; its stems are smooth and hairless with narrow leaves clustering at the base of the plant. The species cream-colored flowers are about 5 to 7 millimeters (mm) (0.25 inch) across and alternate along a stem rising 2.5 to 6 cm (1 to 2.5 inches) above the base of the plant. The flowers begin to bloom in early May. Seeds are small, about 1 mm (0.04 inch) across, and are borne in elliptical seed pods called silicles, which are about 4 to 5 mm (0.2 inch) long. The seeds are shed beginning in June and continuing into July (Reveal 1967; Welsh and Reveal 1977; Welsh et al. 1987). Barneby ridge-cress is endemic to the Indian Canyon drainage (Duchesne County, Utah), specifically to ridge crests of limestone shale derived from Uinta and Green River Formations between 6,200 and 6,500 feet (USFWS 1990). These shale barrens appear white, like highly weathered concrete, and occur in pockets in pinyon-juniper woodlands dominated by pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*). It is found on soils that are shallow, fine-textured shale soils, and intermixed with rock fragments in a zone of interbedding geologic strata. It grows with similar cushion-shaped plant species along semibarren ridges in mixed desert shrub and pinyon-juniper communities. USFWS has not designated critical habitat for the Barneby ridge-cress.

USFWS's Barneby ridge-cress 5-year review (USFWS 2011) and draft Recovery Plan Amendment (2018) identify the following threats to the species: habitat loss and destruction from off-highway vehicle use and energy development; inadequacy of existing regulatory mechanisms; natural biological factors; and climate change as threats to the species.

4.3.4.1 Barneby Ridge-Cress in the Action Area

Field surveys confirmed that areas identified as white on aerial images were also white on the ground and displayed the habitat characteristics described in Section 4.3.4, *Barneby Ridge-Cress*. These white areas were located in pinyon-juniper woodlands and included mound-forming species (Figure 4-9) is a photo of one such location). However, biologists also confirmed that areas adjacent to these white areas were also located in pinyon-juniper habitat and also included other mound-forming species, although the mound-forming species occurred at a higher density in the white shale locations. Figure 4-10 provides a photo of Barneby ridge-cress habitat in a general pinyon-juniper woodland setting. In addition, areas adjacent to the white sites varied in light-brown colors and could be interpreted to resemble weathered concrete. For this reason, potentially suitable habitat is presented in two categories: general pinyon-juniper habitat and white shale habitat.

Figure 4-9. White Shale Habitat

- General pinyon-juniper habitat includes pinyon-juniper woodlands where the USFWS potentially suitable habitat polygon overlaps the action areas.
- White shale habitat is a subset of the general pinyon-juniper habitat and includes sites that appeared white on aerial images where the USFWS potentially suitable habitat polygon overlaps the action areas.

Figure 4-10. Pinyon Juniper Woodland Habitat

Biologists identified approximately 252.42 acres of general pinyon-juniper habitat and 36.19 acres of white shale habitat in the Indian Canyon Alternative action area, and 338.71 acres of general pinyon-juniper habitat and 50.8 acres of white shale habitat in the Whitmore Park Alternative action area (Table 4-4); all suitable habitat is on private land and Tribal trust lands. The USFWS potentially suitable habitat polygon does not overlap the Wells Draw Alternative action area. Figure 4-11 shows the distribution of the suitable Barneby ridge-cress habitat identified in the Indian Canyon Alternative and Whitmore Park Alternative action areas; the Barneby ridge-cress habitat suitability survey report shows the detailed map set (Coalition 2020c). Pinyon-juniper habitat acreage includes white shale habitat acreage and represents the most conservative (highest-acreage) estimate of habitat acreage.

Table 4-4. Barneby Ridge-Cress Habitat in the Action Area (acres)

Action Alternative	Pinyon-juniper Habitat[a]	White Shale Habitat[a]
Indian Canyon	252.42	36.19
Wells Draw	0	0
Whitmore Park	338.71	50.8

Notes:

[a] White shale habitat is subsumed by pinyon-juniper habitat, but the areas are separated in this table to avoid double counting habitat in the overlap area. The pinyon-juniper habitat areas represent the most conservative (highest-acreage) estimate of Barneby ridge-cress habitat.

Source: Coalition 2020c

4.3.5 Pariette Cactus

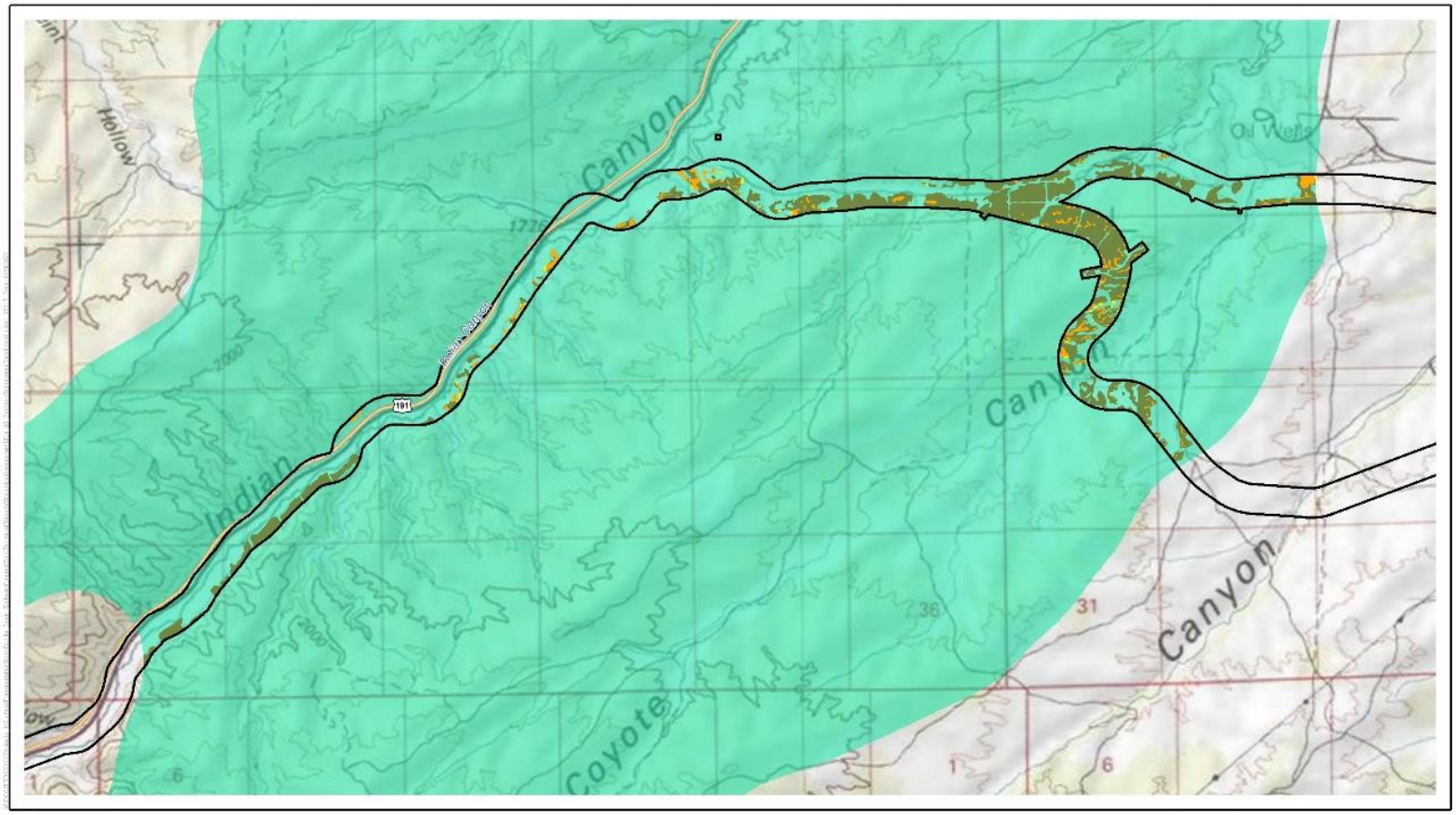
The Pariette cactus (*Sclerocactus brevispinus*) was listed as threatened under the ESA on September 15, 2009 (74 FR 47112). The species is a barrel-shaped and ranges from 2.5 to 8 cm (1.0 to 3.1 inches) tall. Pariette cactus is a morphologically unique Sclerocactus, with flowering adults that are much smaller than either S. *glaucus* or S. *wetlandicus*. Pariette cactus has stems with typically 13 ribs that extend from the ground to the tip of the plant. Along the ribs are areoles (small, cushion-like areas) with hooked spines (Heil and Porter 2004). There are three types of spines, radial and central, defined by the size and position on the plant (74 FR 47112). The bell-shaped flowers usually have pink tepals (petal-like flower parts not differentiated into petals and sepals) and yellow stamens, and are 1 to 1.5 cm (0.4 to 0.6 inch) long and 1.2 to 3 cm (0.4 to 1.2 inches) wide (74 FR 47112). The fruit is short, barrel-shaped, reddish or reddish grey when ripe, 7 to 12 mm (0.3 to 0.5 inch) wide, and 9 to 25 mm (0.35 to 1.0 inch) long. The species is endemic to Duchesne and Uintah Counties, Utah. They are restricted to one area, located in the Pariette Draw, along the Duchesne County–Uintah County border. They grow on highly saline and alkaline fine soils, limited to clay badlands (derived from the Uinta Formation) and in saltbush and sagebrush flats in areas that are sparsely vegetated between 4,590 and 4,920 feet in elevation. Some individuals have been found in marginal habitats outside the main population areas. USFWS has not designated critical habitat for the Pariette cactus.

USFWS has identified the following threats to the species: mineral and energy development, illegal collection, recreation off-road vehicle use, and grazing (USFWS 2015).

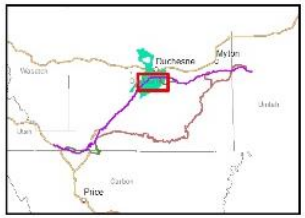
4.3.5.1 Pariette Cactus in the Action Area

Based on USFWS' delineation of suitable Pariette cactus habitat in Utah (USFWS 2011, 2019), there is approximately 1,087 acres of suitable habitat in the Indian Canyon Alternative and Whitmore Park Alternative action areas, and 1,254 acres of habitat in the Wells Draw Alternative action area. Suitable habitat in the action areas is found on private lands, as well as on Tribal trust lands and BLM-administered lands. The USFWS GIS data also include core conservation areas (Core 1 and Core 2) that are subsumed by the suitable habitat areas. These core conservation areas include dense aggregations of the cactus species along with disturbance limits and pollinator buffers that allow for continued connectivity among these aggregations. None of the action areas are within Core 1 conservation areas, but approximately 142.3 acres of the Indian Canyon Alternative and Whitmore Park Alternative action areas are within Core 2 conservation areas. Figure 4-12 shows the locations of suitable Pariette cactus habitat and Core 1 and 2 conservation areas in the action areas.

Figure 4-11. Barneby Ridge-Cress Habitat in the Action Areas



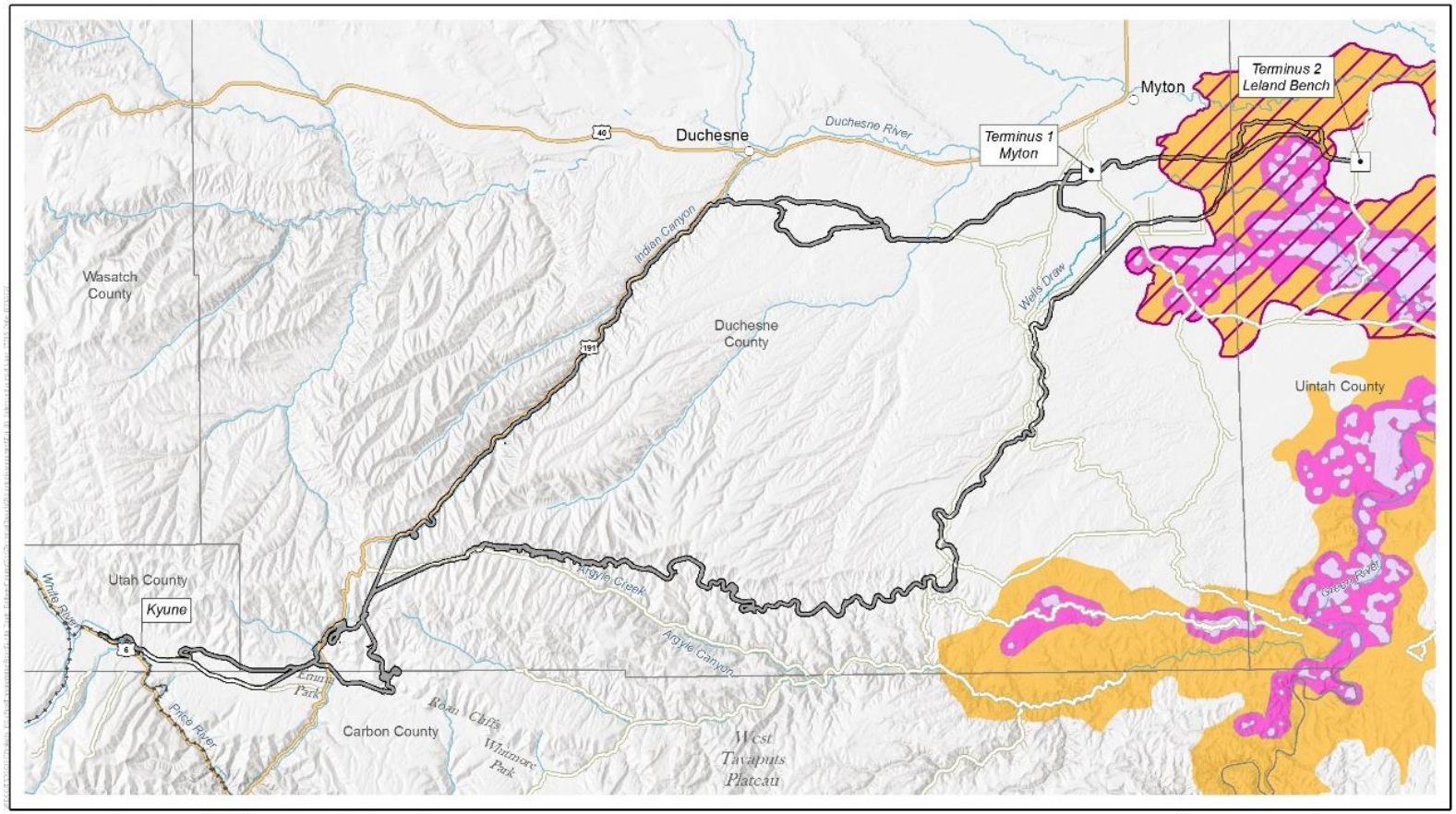
Action Area
Barneby Ridge-cress Potential Habitat
Barneby Ridge-cress Surveyed Habitat
Pinyon-juniper Potential Habitat
Pinyon-juniper/White Shale Potential Habitat
White Shale Potential Habitat



Source: USFWS 2011, Coalition 2020c.

N
0 0.5 1 Miles

Figure 4-12. Pariette Cactus and Uinta Basin Hookless Cactus Suitable Habitat in the Action Areas



4.3.6 Uinta Basin Hookless Cactus

The Uinta Basin hookless cactus (*Sclerocactus wetlandicus*) was listed as threatened under the ESA on September 15, 2009 (74 FR 47112). The species is a barrel-shaped cactus that ranges from 4 to 18 cm (1.5 to 7 inches) tall, with exceptional plants up to 30 cm (12 inches) tall. The stems have typically 12 to 15 ribs that extend from the ground to the tip of the plant. Along the ribs are areoles with hooked spines radiating out (Heil and Porter 2004). There are two types of spines, radial and central, defined by the size and position on the plant (74 FR 47112). The 6 to 14 radial spines are located around the margin of the areole, extending in a plane parallel to the body of the plant. The funnel-shaped flowers usually have pink to violet tepals (petal-like flower parts not differentiated into petals and sepals) with yellow stamens, and are 2 to 5 cm (0.8 to 2 inches) long and 2 to 5 cm (0.8 to 2 inches) in diameter (74 FR 47112). The fruit is short, barrel-shaped, reddish or reddish grey when ripe, 7 to 12 mm (0.3 to 0.5 inches) wide, and 9 to 25 mm (0.35 to 1.0 inches) long. Populations of endemic Uinta Basin hookless cactus occur primarily in Uinta County, Utah, along the Green River, the White River, and their tributaries; the species also occurs in Carbon and Duchesne Counties, Utah (USFWS 2012b). The species is generally found on coarse soils derived from cobble and gravel river terrace deposits, or rocky surfaces on mesa slopes at 4,400 to 6,200 feet in elevation (USFWS 2012b). USFWS has not designated critical habitat for the Uinta Basin hookless cactus.

When USFWS listed the species, the primary threats included oil and gas development, recreational and off-road vehicle use, and illegal collection. All of these threats remain today. New threats include climate change, parasitism by the cactus-borer beetle, and invasive weeds (USFWS 2012b).

4.3.6.1 Uinta Basin Hookless Cactus in the Action Area

Based on USFWS' delineation of suitable Uinta Basin hookless cactus habitat in Utah (USFWS 2011, 2019), there is approximately 1,087 acres of suitable habitat in the Indian Canyon Alternative and Whitmore Park Alternative action areas, and 1,254 acres of habitat in the Wells Draw Alternative action area. Suitable habitat in the action areas is found on private lands, as well as on Tribal trust lands and BLM-administered lands. The USFWS GIS data also include core conservation areas (Core 1 and Core 2) that are subsumed by the suitable habitat areas. These core conservation areas include dense aggregations of the cactus species along with disturbance limits and pollinator buffers that allow for continued connectivity among these aggregations. None of the action areas are within Core 1 conservation areas, but approximately 142.3 acres of the Indian Canyon Alternative and Whitmore Park Alternative action areas are within Core 2 conservation areas. Figure 4-12 shows the locations of suitable Uinta Basin cactus habitat and Core 1 and 2 conservation areas in the action areas.

4.3.7 Ute Ladies'-Tresses

The Ute ladies'-tresses (*Spiranthes diluvialis*) was listed as threatened under the ESA on January 17, 1992 (57 FR 2048). It is a perennial, terrestrial orchid with stems 20 to 50 cm (8 to 20 inches) tall, arising from tuberously thickened roots. The leaves are narrow (1.0 cm / 0.39 in) and can reach 28 cm (11 inches) in length; basal leaves are the longest and become reduced in size up the stem. The flowering stalk consists of few to many small white or ivory flowers clustered into a spike arrangement at the top of the stem. The species is characterized by whitish, stout, ringent (gaping at the mouth) flowers, which generally bloom from late July through August. The Ute ladies'-tresses occurs below 7,000 feet in elevation along riparian edges, gravel bars, old oxbows, high flow

channels, and moist to wet meadows along perennial streams. It is commonly found in stable wetland and seepy areas associated with old landscape features within historical floodplains of major rivers. It can also be found in wetland and seepy areas near freshwater lakes or springs. Populations of Ute ladies'-tresses orchids are known from three broad general areas of the interior western United States: near the base of the eastern slope of the Rocky Mountains in southeastern Wyoming and adjacent Nebraska and north-central and central Colorado; in the upper Colorado River basin, particularly in the Uinta Basin; and in the Bonneville Basin along the Wasatch Front and westward in the eastern Great Basin, in north-central and western Utah, extreme eastern Nevada, and southeastern Idaho. The orchid also has been discovered in southwestern Montana and in the Okanogan area and along the Columbia River in north-central Washington (USFWS 2020b). USFWS has not designated critical habitat for the Ute ladies'-tresses.

USFWS has listed the following threats to the species: loss of habitat related to changes in stream flow, trampling by livestock and recreationists, competition from aggressive weeds, low reproductive rate, and increased vulnerability to stochastic events because of small, scattered colonies (USFWS 1995b).

4.3.7.1 Ute Ladies-Tresses in the Action Area

Biologists identified approximately 11.40 acres of potential Ute ladies'-tresses habitat in the Indian Canyon Alternative action area, 0.99 acre in the Wells Draw Alternative action area, and 11.35 acres in the Whitmore Park Alternative action area. Suitable habitat is primarily on private lands, but small areas of suitable habitat were found on Tribal trust land, Forest Service land, and UDOT land in the Indian Canyon Alternative and Whitmore Park Alternative action areas. The Ute ladies'-tresses habitat suitability survey report shows the detailed distribution of the suitable Ute ladies'-tresses habitat identified in the action areas (Coalition 2020d). Suitable Ute ladies'-tresses habitat identified in each Action Alternative's action area are summarized below.

Indian Canyon Alternative Action Area

The majority of suitable Ute ladies'-tresses habitat for the Indian Canyon Alternative action area occurs on wetland terraces adjacent to Indian Canyon Creek and wet meadow wetlands that rely on Indian Canyon Creek as a primary source of hydrology. These terraces and wet meadows often exhibit moderately dense vegetation and nonsaline conditions, which provide suitable habitat for Ute ladies'-tresses (Figure 4-13). Areas with very dense vegetation or with apparent saline indicators (saline indicators included salt crust or a dominance of saltgrass) were excluded as potential habitat. Within the Indian Canyon Alternative action area, common plant species found in areas identified as suitable Ute ladies'-tresses habitat include mountain rush (*Juncus arcticus* ssp. *littoralis*), foxtail barley (*Hordeum jubatum*), alkali buttercup (*Ranunculus cymbalaria*), and willow species (*Salix* species).

Figure 4-13. Ute Ladies'-Tresses Habitat (Wet Meadow Terrace)

Indian Canyon Creek characteristics can vary throughout Indian Canyon, with the stream becoming more incised as it travels down canyon toward Duchesne, Utah. As the stream becomes more deeply incised, there are fewer floodplain and terrace features and, therefore, less suitable habitat for Ute ladies'-tresses.

Two smaller sites containing suitable Ute ladies'-tresses habitat were identified outside and east of Indian Canyon in the Indian Canyon Alternative action area. These sites total 1.1 acres and are located on floodplains and terraces of two different intermittent stream channels.

Wells Draw Alternative Action Area

Unlike the Indian Canyon Alternative and Whitmore Park Alternative, the Wells Draw Alternative avoids Indian Canyon, where a majority of the suitable Ute ladies'-tresses habitat was identified. Just under 1 acre (0.99 acre) of suitable Ute ladies'-tresses habitat was identified in the Leland Bench area of the Wells Draw Alternative action area. These sites receive water from small streams and canal diversions (Figure 4-14 shows one site). Common plant species identified in suitable Ute ladies'-tresses habitat in the Wells Draw Alternative action area include mountain rush and foxtail barley. High salinity is common in the Wells Draw Alternative action area, which limited the amount of suitable Ute ladies'-tresses habitat.

Figure 4-14. Ute Ladies'-Tresses Habitat (Diversion Canal)

Whitmore Park Alternative Action Area

The Whitmore Park Alternative action area mirrors that of the Indian Canyon Alternative action area through Indian Canyon because in this area the two alternatives are in the same footprint. The action areas differ slightly as the alternatives head east toward the Myton Bench area, where the Whitmore Park Alternative veers south for a short distance until rejoining with the Indian Canyon Alternative. This distinction among routes accounts for the slight difference (0.06 acre) in suitable Ute ladies'-tresses habitat identified in the Indian Canyon Alternative and Whitmore Park Alternative actions areas.

Chapter 5
Environmental Baseline

The proposed rail line would be located primarily within the Colorado Plateau ecoregion and would cross the following subregions (Woods et al. 2001).

- **Semiarid Benchlands and Canyonlands.** The Semiarid Benchlands and Canyonlands subregion is characterized by benches[4] and mesas covered with broad grass, shrub, and woodlands. Bedrock exposures are common and common plant species include warm season grasses, winterfat (*Krascheninnikovia lanata*), Mormon tea (*Ephedra viridis*), four-wing saltbush (*Atriplex canescens*), sagebrush, and pinyon and juniper woodlands.
- **Escarpments.** The Escarpments subregion is characterized by deeply dissected cliff-bench complexes that ascend from lower regions to the mountain rims. Common vegetation includes Douglas-fir forest on steep, north-facing slopes at higher elevations to desert and semidesert grassland or shrubland on lower, drier sites.
- **Uinta Basin Floor.** The Uinta Basin Floor subregion lies in a large basin that is enclosed by the Uinta Mountains and Tavaputs Plateau. Precipitation is typically low and soils are arid, but the area receives stream runoff from the nearby mountains. Stream runoff is often diverted for crop and pasture irrigation on gentle slopes and the valley floor.

A small portion of the proposed rail line would be located in the Wasatch Montane Zone and Mountain Valleys subregions of the Wasatch and Uinta Mountains ecoregion (Woods et al. 2001). The Wasatch Montane Zone consists of forested mountains and plateaus where Douglas-fir and aspen forests are common and Engelmann spruce and subalpine fir grow on steep, north-facing slopes. The Mountain Valleys subregion, which is mostly unforested, contains terraces, floodplains, alluvial fans,[5] and hills and is naturally dominated by sagebrush. Irrigated cropland, irrigated pastureland, and rangeland are common.

The existing habitat in the vicinity of the proposed rail line has been fragmented by previous construction of highway corridors and smaller roads and conversion of land for agricultural, residential, commercial, and industrial uses. The major highways crossed by or near the Action Alternatives are US 191 and U.S. Highway 6 (US 6). Smaller paved and dirt roads provide access to homes, businesses, and oil well pads. These land use changes have disrupted the continuity of the original wildlife habitat. This disruption of continuity has likely affected the function of the original wildlife habitat and the foraging habits, reproductive habits, and migratory movements of many species. Vegetation communities along the proposed rail line can be categorized into six broad land cover types based on U.S. Geological Survey GAP/LANDFIRE data (USGS 2016): agriculture/altered, badland/bedrock, forest/woodland, meadow/grassland, open water, and shrubland. Riparian vegetation also occurs along water courses in areas transitioning from aquatic to upland environments. These transitional areas provide important habitat for many plant and animal species. A total of 261 plant species were recorded during biological resources baseline field surveys (Coalition 2020a).

[4] A bench (or structural bench) is a shelf or step-like landform.

[5] Alluvial fans are fan-shaped deposits of water-transported material (called alluvium). They typically form at the base of topographic features where there is a noticeable break in slope.

Chapter 6
Effects Analysis

This chapter describes the potential effects associated with the proposed project on federally listed species. Direct effects are defined as the direct or immediate effects of the proposed project and include all immediate impacts from project-related actions (e.g., construction-related impacts such as loss of habitat) and those disturbances that are directly related to project elements that occur very close to the time of the action itself. Indirect effects include those effects that are caused by or will result from the proposed project and are later in time (generally after the construction period), but are still reasonably certain to occur.

6.1 Canada Lynx

6.1.1 Construction

Construction-related activities, such as land clearing in the project footprint, earthmoving (cut and fill), constructing the railbed, laying rail line, and relocating roads, could result in impacts on Canada lynx. It is important to note that these impacts should be viewed in the context of the potential for the species to be present in the action area, and as described in Section 4.3.1.1, *Canada Lynx in the Action Area*, Canada lynx habitat in the action areas is marginal at best, and the presence of the species would be extremely rare.

6.1.1.1 Habitat Loss or Alteration and Displacement

Construction of the proposed rail line would remove or alter habitat snowshoe hare habitat, which can be associated with Canada lynx. However, as described Section 4.3.1.1, *Canada Lynx in the Action Area,* more detailed Canada lynx habitat mapping indicates habitat is much more limited in the action areas and is marginal quality at best. In areas where construction would involve clearing habitat, any Canada lynx that may be present would be displaced and forced to move to other habitat areas. Construction-related noise and the presence of humans in construction areas could also displace Canada lynx. Displacement could affect normal foraging and migratory behaviors. Displacement could also reduce survival and productivity because animals might need to expend more energy to locate suitable replacement habitat. However, the habitat in the action areas does not support breeding females.

The effects of habitat clearing would be permanent in areas where permanent rail components (e.g., railbed) would be placed and would be temporary in areas where habitat would be restored (e.g., construction staging areas). In some areas of the project footprint, habitat would be permanently altered from forested habitat to herbaceous or low shrub habitats as a result of temporary clearing. Canada lynx disturbed or displaced by temporary construction activities would likely move to suitable habitats near the project footprint. However, the large areas of habitat around the Action Alternatives would be sufficient to allow for Canada lynx movement and dispersal.

6.1.1.2 Injury or Mortality

Construction of the proposed rail line could result in Canada lynx mortality or injury from construction-related collisions, if any lynx were present in the action area. However, collisions with a larger animal like Canada lynx would be less likely to occur because they could move more quickly and vacate a construction area compared to smaller, less mobile animals. Because construction vehicles typically move at slow speeds, OEA expects that fatalities and injuries from operating construction equipment would be infrequent. Canada lynx would likely vacate a construction area once land clearing activities start and noise and construction equipment become perceptible. This temporary impact would only last for the duration of construction.

6.1.1.3 Accidents and Spills of Hazardous Materials

An accidental release of hazardous materials during construction (e.g., spill of gasoline, oil, or lubricants) could affect Canada lynx if they were exposed to the contaminant, which could cause injury, sickness, or death. Because construction activities would not involve using or storing large volumes of hazardous materials, OEA expects that any uncontained spills of hazardous materials during construction would be small and would affect a limited area. To minimize potential impacts related to accidents and spills of hazardous materials, OEA is recommending mitigation requiring the Coalition obtain a National Pollutant Discharge Elimination System (NPDES)[6] permit and implement a stormwater pollution prevention plan (SWPPP) and best management practices (e.g., sediment barriers), as required by the NPDES permit (Chapter 7, *Mitigation and Minimization Measures*). These measures would limit the chance of a spill occurring and would facilitate a rapid cleanup should a spill occur.

6.1.2 Operations

Rail operations could temporarily and permanently affect Canada lynx, if any were present in the action area, by introducing new sources of noise in the action area; changing the likelihood and spread of wildfires; introducing a source of potential spills and leaks of toxic substances; and altering habitat in the rail corridor during maintenance. Total rail traffic on the proposed rail line could range from 3.68 to 10.52 trains per day, on average, depending on future market conditions. The number of trains per day would not change the types of operations impacts, but it could affect the frequency of the impact (e.g., more trains could result in increased maintenance activities) or increase the chance of the impact occurring (e.g., more trains could increase the risk of sparking a wildfire).

6.1.2.1 Injury or Mortality

Operation of the proposed rail line could injure or kill individual Canada lynx due to collisions with trains and maintenance equipment, if any lynx were present in the action area. Higher mortality rates would likely occur where species density is higher. The maximum speed for a loaded train would be 10 to 20 miles per hour, which would likely be slow enough for a large animal like Canada lynx to see and hear the train in advance of a potential strike, allowing an individual to flee the area. Unloaded trains may move faster, and the track is designed for a maximum speed of 40 miles per hour, which would increase the risk of Canada lynx strikes.

[6] The National Pollutant Discharge Elimination System (NPDES) permit, issued by the state of Utah, is the permit system mandated by Clean Water Act Section 402 to control pollutants in waters of the United States.

6.1.2.2 Habitat Degradation and Displacement

Rail operations could displace Canada lynx, if any were present in the action area, and render adjacent habitat unsuitable. Operation of the proposed rail line would degrade habitat because of increased noise, dust, and potential spills of contaminants. Increased noise levels could result in fright responses, such as flushing or escaping. These noise impacts could cause species to expend more energy near the rail line or avoid the area. As discussed previously, displacement could result in reduced survival and productivity because it requires species to expend energy to locate replacement habitat, which may have fewer resources and be of a lower value. OEA anticipates that any Canada lynx that may be present would become used to, or habituate to, the noise of an operating train and maintenance equipment and would likely avoid the area for the short period that a train or equipment is present.

The proposed rail line could act as a fire source or a potential fire break (i.e., a gap in vegetation type that slows or stops a fire), which could change the natural fire regime of the ecosystem, thereby altering the composition of habitat over time. Section 6.4, *Federally Listed Plants (Barneby Ridge-Cress, Pariette Cactus, Uinta Basin Hookless Cactus, Ute Ladies'-Tresses)*, discusses potential wildfire impacts and OEA's recommended mitigation.

6.1.2.3 Accidents and Spills of Hazardous Materials

The Coalition anticipates that rail traffic on the proposed rail line would consist primarily of trains transporting crude oil. Train accidents or derailments could cause tanker cars to rupture and spill crude oil into the environment. The potential impact of crude oil on the environment would first depend on a train accident or derailment occurring, and then on whether or not the accident or derailment was severe enough to result in a rupture and release of crude oil. Based on train accident and derailment modeling, operation of any of the Action Alternatives would yield a small number of predicted accidents per year, with roughly one accident involving a loaded train every 3 to 10 years, depending on the alternative, and only 25 percent of those would be expected to have any release.

Uinta Basin black and yellow crude oils are waxy crude oils that have a wax content higher than most North American crude oils. The oil does not flow at room temperature and must be heated at higher temperatures for it to flow. Because of this, the oil tends not to disperse if it is spilled onto land. If it is spilled in water, the oil tends to form globules of semisolid material that tend to stay in place. For example, the Utah Department of Environmental Quality (UDEQ) documented an oil spill incident (July 12, 2018) and cleanup effort where a tanker truck spilled 1,000 gallons of crude oil that reached the Price River in Carbon County (UDEQ 2018, 2019). Due to the oil's properties, as the crude oil spilled onto the road surface, it began to harden, so only a small amount actually made it to the river. Once the oil reached the river, instead of forming a giant slick on the water surface, the oil solidified and formed floating chunks that were easily removed by hand and with assistance from a boom. Sampling of public drinking water supply intakes downstream of the spill showed no exceedances of drinking water standards. In the report for this spill (UDEQ 2019), UDEQ stated that Uinta Basin crude oil has been described as "cleanup friendly" and that "thanks to the nature of the crude oil, most of these spills can be easily cleaned up afterward." A similar incident occurred in the Provo River in 2015 with similar results (Central Utah Water Conservancy District 2015, 2016; Orvis News 2015).

As with most crude oils, Uinta Basin crude oil is toxic and an accidental release could have adverse effects on the environment, including permanent and temporary impacts on vegetated habitats.

However, the oil's properties would help reduce the potential impact and make cleanup easier than most crude oils, thereby helping to avoid or minimize the long-term chronic effects from spill of typical crude oils that would spread out over large areas as giant slicks. To minimize potential impacts related to crude oil spills, OEA is recommending mitigation requiring the Coalition develop and implement a spill prevention plan, and immediately contact appropriate agencies and take immediate remedial actions in the event of a spill (Chapter 7, *Mitigation and Minimization Measures*).

An accidental release of other hazardous materials during operations (e.g., fuel leaks from locomotives or maintenance vehicles) could affect individual Canada lynx if they were exposed to the contaminant, which could cause injury, sickness, or death. OEA expects that any release of hazardous materials during operations would be small and would affect a limited area. To minimize potential impacts related to accidents and spills of hazardous materials, OEA is recommending mitigation requiring the Coalition obtain an NPDES permit and implement a SWPPP and best management practices (e.g., sediment barriers), as required by the NPDES permit (Chapter 7, *Mitigation and Minimization Measures*). These measures would help contain a release of hazardous materials and would facilitate rapid cleanup should a spill occur.

6.1.3 Canada Lynx Impact Summary

Construction and operation of the proposed rail line could affect Canada lynx and its habitat. However, as described in Section 4.3.1.1, *Canada Lynx in the Action Area*, Canada lynx habitat in the action areas is marginal at best, and the presence of a Canada lynx would be extremely rare and would represent a dispersing Canada lynx. As such, the potential impacts from the proposed rail line would be insignificant and discountable, because the effects would be extremely unlikely to occur, and if they were to occur, the impact could not be meaningfully measured, detected, or evaluated. Therefore, OEA determines the impact from the proposed rail line would have no population level effects and never reach the scale where take would occur.

6.2 Mexican Spotted Owl

6.2.1 Construction

Construction-related activities, such as land clearing in the project footprint, earthmoving (cut and fill), constructing the railbed, laying rail line, relocating roads, and installing support facilities (e.g., fences, communications towers, and power distribution lines), could result in temporary and permanent impacts on Mexican spotted owl. It is important to note that these impacts should be viewed in the context of the potential for the species to be present in the action area, and as described in Section 4.3.2.1, *Mexican Spotted Owl in the Action Area*, the majority of habitat in the action areas is considered low quality, which consists of either nonhabitat or habitat that would unlikely support the species.

6.2.1.1 Habitat Loss or Alteration and Displacement

Construction of the proposed rail line would remove or alter Mexican spotted owl habitat, resulting in permanent habitat loss or alteration in the rail line footprint. Table 6-1 shows the amount of suitable Mexican spotted habitat that would be permanently removed or temporarily disturbed. As

stated in Section 4.3.2.1, *Mexican Spotted Owl in the Action Area*, most of the habitat identified along the Action Alternatives is considered low quality and would be unlikely to support or be used by the species. The Indian Canyon Alternative and Whitmore Park Alternative would not affect any moderate-quality habitat because none was identified during field surveys, while the Wells Draw Alternative would permanently and temporary affect a very small area of moderate-quality habitat. In these areas where construction would involve clearing habitat, any Mexican spotted owls that may be present would be displaced, or forced to move to other habitat areas. Construction-related noise and the presence of humans in construction areas could also displace Mexican spotted owls. Displacement could affect normal foraging, migratory, and breeding behaviors. Displacement could also reduce survival and productivity because individuals might need to expend more energy to locate suitable replacement habitat.

Table 6-1. Permanent Removal of and Temporary Disturbance to Mexican Spotted Owl Habitat (acres)

	Permanent Removal[a]		Temporary Disturbance[a]	
Action Alternative	**Low Quality**	**Moderate Quality**	**Low Quality**	**Moderate Quality**
Indian Canyon	584.8	0	865.8	0
Wells Draw	1,856.0	0.3	3,533.3	1.8
Whitmore Park	777.8	0	1,531.7	0

Notes:

[a] Habitat defined as high quality during Mexican spotted owl habitat surveys was not observed along any Action Alternative.

The effects of habitat clearing would be permanent in areas where permanent rail components (e.g., railbed) would be placed and would be temporary in areas where habitat would be restored (e.g., construction staging areas). In some areas of the project footprint, habitat would be permanently altered from forested habitat to herbaceous or low shrub habitats as a result of temporary clearing.

Mexican spotted owls disturbed or displaced by temporary construction activities would likely move to suitable habitats near the project footprint and would likely return to temporarily affected areas after construction is completed and workers and equipment are no longer present. The magnitude of these impacts would depend mostly on the timing of construction activities. However, the areas of suitable habitat around the Action Alternatives would be sufficient to allow for movement and dispersal. To minimize impacts related to the clearing of habitat, OEA is recommending mitigation requiring the Coalition limit ground clearing to only the areas necessary for project-related construction activities and to restore and revegetate temporarily cleared areas using native vegetation (Chapter 7*, Mitigation and Minimization Measures*).

6.2.1.2 Injury or Mortality

Construction of the proposed rail line could result in mortality or injury from construction-related collisions, if any Mexican spotted owls were present in the action area. However, collisions would be less likely to occur with birds because they could move more quickly and vacate a construction area. Because construction vehicles typically move at slow speeds, OEA expects that fatalities and injuries from operating construction equipment would be infrequent. Any Mexican spotted owls that may be present would likely vacate a construction area once land-clearing activities start and noise and

construction equipment become perceptible. This temporary impact would only last for the duration of construction.

6.2.1.3 Accidents and Spills of Hazardous Materials

An accidental release of hazardous materials during construction (e.g., spill of gasoline, oil, or lubricants) could affect Mexican spotted owls if they were exposed to the contaminant, which could cause injury, sickness, or death. Because construction activities would not involve using or storing large volumes of hazardous materials, OEA expects that any uncontained spills of hazardous materials during construction would be small and would affect a limited area. To minimize potential impacts related to accidents and spills of hazardous materials, OEA is recommending mitigation requiring the Coalition obtain an NPDES permit and implement an SWPPP and best management practices (e.g., sediment barriers), as required by the NPDES permit (Chapter 7, *Mitigation and Minimization Measures*). These measures would limit the chance of a spill occurring and would facilitate a rapid cleanup should a spill occur.

6.2.2 Operations

Rail operations could temporarily and permanently affect Mexican spotted owl, if any were present in the action area, by introducing new sources of noise in the action area; changing the likelihood and spread of wildfires; introducing a source of potential spills and leaks of toxic substances; and altering vegetation in the rail corridor during maintenance. Total rail traffic on the proposed rail line could range from 3.68 to 10.52 trains per day, on average, depending on future market conditions. The number of trains per day would not change the types of operations impacts, but it could affect the frequency of the impact (e.g., more trains could result in increased maintenance activities) or increase the chance of the impact occurring (e.g., more trains could increase the risk of sparking a wildfire).

6.2.2.1 Injury or Mortality

Operation of the proposed rail line could injure or kill individual Mexican spotted owls, if any were present in the action area, due to collisions with trains and maintenance equipment. Higher mortality rates would likely occur where the species density is higher. The maximum speed for a loaded train would be 10 to 20 miles per hour, which would likely be slow enough for birds like Mexican spotted owl to see and hear the train in advance of a potential strike, allowing an individual to flee the area. Unloaded trains may move faster, and the track is designed for a maximum speed of 40 miles per hour, which would increase the risk of Mexican spotted owl strikes.

6.2.2.2 Habitat Degradation and Displacement

Operation of the proposed rail line would degrade habitat because of increased noise, dust, and potential spills of contaminants. Increased noise levels could result in fright responses, such as flushing or escaping, or increased communications, such as louder or more extended periods of birdsong or begging vocalizations from young birds. These noise impacts could cause individuals to expend more energy near the rail line or avoid the area. Noise related to rail operations could cause birds to abandon their nests with the subsequent demise of young. As discussed previously, displacement could result in reduced survival and productivity because it requires individuals to expend energy to locate replacement habitat, which may have fewer resources and be of a lower

value. Individuals would also be less familiar with new areas and at greater risk of predation, thus, limiting survival of offspring or adults.

Spills of fuels, oils, lubricants, or other hazardous materials during maintenance activities could degrade habitats; however, the areas of suitable habitats around the Action Alternatives would be sufficient to allow for movement and dispersal.

The proposed rail line could act as a fire source or a potential fire break (i.e., a gap in vegetation type that slows or stops a fire), which could change the natural fire regime of the ecosystem, thereby altering the composition of habitat over time. Section 6.4, *Federally Listed Plants (Barneby Ridge-Cress, Pariette Cactus, Uinta Basin Hookless Cactus, Ute Ladies'-Tresses)*, discusses potential wildfire impacts and OEA's recommended mitigation.

6.2.2.3 Encounters with Project Infrastructure

Rail line infrastructure could affect species survival and reproductive success. Power distribution lines, communications towers, and fences associated with the proposed rail line could adversely affect Mexican spotted owl, if any were present in the action area, through collision impacts, which could result injury or death. However, the Coalition is not proposing fences unless a landowner agreement requests one, and OEA anticipates that installation of new power distribution lines would be limited. Power lines would be constructed primarily near road crossings where they could be connected to existing distribution lines. In more remote or inaccessible locations, OEA anticipates the Coalition would use solar-powered equipment, which would have fewer impacts. Communications towers, which would be approximately 120 feet tall, also could present a collision hazard. Each Action Alternative would require the construction of four communications towers. To address potential adverse impacts on wildlife related to communications towers, OEA is recommending mitigation requiring the Coalition follow the USFWS *Recommended Best Practices for Communication Tower Design, Siting, Construction, Operation, Maintenance, and Decommissioning* (USFWS 2018) to avoid or minimize the risk of bird mortality at communications towers (Chapter 7, *Mitigation and Minimization Measures*).

6.2.2.4 Accidents and Spills of Hazardous Materials

Oil could spill from a tanker car onto Mexican spotted owl habitat should a train accident or derailment occur. Section 6.1.2.3, *Accidents and Spills of Hazardous Materials*, discusses the probability of an oil spill occurring during operations and the characteristics of Uinta Basin crude oil that limits its spread when spilled in the natural environment. If cleanup and oil removal were to commence immediately after a spill, impacts would be minimized. However, some permanent and temporary habitat impacts could occur during cleanup, which could result in the loss of vegetation and establishment and spread of noxious and invasive weeds. OEA's recommended mitigation regarding the prevention and treatment of spills would minimize these potential impacts (Chapter 7, *Mitigation and Minimization Measures*).

An accidental release of other hazardous materials during operations (e.g., fuel leaks from locomotives or maintenance vehicles) could affect individual Mexican spotted owls if they were exposed to the contaminant, which could cause injury, sickness, or death. OEA expects that any release of hazardous materials during operations would be small and would affect a limited area. To minimize potential impacts related to accidents and spills of hazardous materials, OEA is recommending mitigation requiring the Coalition obtain an NPDES permit and implement an SWPPP

and best management practices (e.g., sediment barriers), as required by the NPDES permit (Chapter 7, *Mitigation and Minimization Measures*). These measures would help contain a release of hazardous materials and would facilitate rapid cleanup should a spill occur.

6.2.3 Mexican Spotted Owl Impact Summary

Construction and operation of the proposed rail line could affect Mexican spotted owl and its habitat. However, as described in Section 4.3.2.1, *Mexican Spotted Owl in the Action Area*, the majority of habitat across all the Action Alternatives' action areas is considered low quality, which consists of either nonhabitat or habitat that would unlikely support the species. One very small area of moderate-quality habitat would be affected along the Wells Draw Alternative (Table 6-1). However, as stated in Section 4.3.2.1, *Mexican Spotted Owl in the Action Area*, even this moderate-quality habitat is small and isolated from known nesting habitat, and because of this lack of connectivity, the habitat likely reduces the probability of occupancy in this habitat. Further, there are no known Mexican spotted owl observations in the action areas or within a 2-mile buffer of the Action Alternatives (UDWR 2019). Based on this information, the presence of a Mexican spotted owls in the action areas would be rare. As such, the potential impacts from the proposed rail line would be insignificant and discountable, because the effects would be extremely unlikely to occur, and if they were to occur, the impact could not be meaningfully measured, detected, or evaluated. Therefore, OEA determines the impact from the proposed rail line would have no population level effects and never reach the scale where take would occur.[7]

6.3 Upper Colorado River Basin Fish (Colorado Pikeminnow, Humpback Chub, Bonytail, Razorback Sucker)

There is no suitable aquatic habitat for or presence of Upper Colorado River Basin Fish in the action areas along any of the Action Alternatives or within a distance downstream that could be affected by the proposed rail line; therefore, there would be no direct impact on the species or their habitats from construction or operations. However, water withdrawals in the Upper Colorado River Basin for constructing the proposed rail line could indirectly affect Upper Colorado River Basin Fish. USFWS has issued consultation guidance specific to addressing potential impacts on these species for actions that propose to use surface or groundwater in the Upper Colorado River Basin (USFWS 2010). As stated in USFWS' consultation guidance, any action that depletes water from the Upper Colorado River Basin can have adverse effects on Upper Colorado River Basin Fish and their designated critical habitat by reducing water quality and quantity.

The Coalition proposes to use surface or groundwater to construct the proposed rail line, so there could be potential impacts on the species related to water depletions in the basin. USFWS has

[7] OEA would reconsider this effects analysis if the Board were to license the Wells Draw Alternative and OEA reinitiated consultation on the Wells Draw Alternative. While OEA believes this effects analysis would have a high likelihood of remaining the same due to the small, isolated, and disconnected nature of the moderate-quality habitat identified that reduces the likelihood of occupancy, OEA has included a measure in Chapter 7 that would require the Coalition to conduct Mexican spotted owl surveys in these moderate-quality habitat areas if the Board were to license the Wells Draw Alternative. Those surveys would inform whether or not OEA would change the effects analysis for the species.

developed an ESA Section 7 decision tree to determine the appropriate effects determinations for these species; the decision tree generates a conclusion of either "not likely to adversely affect" or "likely to adversely affect", which is based on the amount of water used for a proposed action and whether or not the water source is considered "historic" (i.e., water right permitted prior to 1988). The decision tree states that any water use more than 0.1 acre-feet and from a source not considered historic requires formal consultation, and therefore by definition, is an action that would "likely adversely affect" Upper Colorado River Basin Fish. The Coalition estimates that 1,650 acre-feet of water would be needed to construct the Indian Canyon Alternative, 8,890 acre-feet to construct the Wells Draw Alternative, and 1,750 acre-feet to construct the Whitmore Park Alternative. The Coalition has stated that this water would be sourced through existing water rights near the Action Alternatives, and that it would not pursue new water rights. However, the Coalition is unable to identify the specific existing water rights that it could use at this time; therefore, it is unknown if the water right will be considered historic. In the absence of this information, OEA is conservatively assuming that the Coalition's water source will not be historic. Therefore, the effects determination for Upper Colorado River Basin Fish based on the ESA Section 7 decision tree for the Action Alternatives is "likely to adversely affect."

In addition, the water volume is used as a metric to determine if a depletion fee[8] is required or if a Recovery Implementation Program Recovery Plan (RIPRAP) action may be necessary as part of completing formal consultation. Based on the ESA Section 7 decision tree, the Indian Canyon Alternative and Whitmore Park Alternative would require a depletion fee because greater than 100 acre-feet of water would be used from the Basin for constructing these Action Alternatives. The Wells Draw Alternative would require the depletion fee and a RIPRAP action because greater than 4,500 acre-feet would be required to construct the alternative. Should the Board license an Action Alternative, the Coalition would commit to and be responsible for these measures (Chapter 7, *Mitigation and Minimization Measures*).

6.4 Federally Listed Plants (Barneby Ridge-Cress, Pariette Cactus, Uinta Basin Hookless Cactus, Ute Ladies'-Tresses)

6.4.1 Impacts Common to Federally Listed Plants

Construction and operation of the proposed rail line would result in impacts on federally listed plants. This subsection first presents the potential impacts that would be the same for all federally listed plants because all of the impact types and mechanisms would be the same for these plants. Potential impacts caused by rail line construction are discussed followed by potential impacts caused by rail operations. Impacts in this subsection are qualitatively discussed. Subsection 6.4.2, *Impact by Plant Species*, presents the quantified impacts by federally listed plant species for the Action Alternatives.

[8] The current deletion fee for the 2020 fiscal year ending September 30 is $22.12 per acre-foot.

6.4.1.1 Construction

Construction of the proposed rail line would involve clearing, excavating, and filling within the project footprint, which would result in the permanent loss or alteration of federally listed plants and their suitable habitat. Construction could also affect federally listed plants beyond the project footprint as a result of fugitive dust emissions, the introduction and/or spread of noxious weeds, and releases (spills) of hazardous materials. The extent of such impacts would vary based on the affected plant species, relative abundance of the species, soil conditions, hydrology, topography, and the extent of earthmoving required for construction.

Clearing and Fill Placement

Within the rail line footprint, construction would involve the permanent removal of suitable habitat for federally listed plants to allow for the placement of fill for regrading of the rail corridor, construction of the railbed, and installation of permanent project-related features, such as permanent access roads. Following construction, some natural regrowth could occur in areas within the rail line footprint that are not periodically maintained for vegetation control. However, regrowth would be sparse in areas that would be continually disturbed by railroad maintenance. In the temporary footprint, construction would involve temporarily clearing suitable federally listed plant habitat for construction staging areas, temporary access roads, and temporary facilities; these temporarily disturbed areas are considered permanent impact for the purposes of this BA. To minimize impacts related to clearing and fill placement, OEA is recommending mitigation requiring the Coalition limit construction activities that could disturb suitable federally listed plant habitat to the rail line footprint and immediately surrounding areas, to the extent practicable, and immediately restore cleared suitable habitat in the temporary footprint after construction has been completed (Chapter 7, *Mitigation and Minimization Measures*). In addition, OEA is recommending the Coalition conduct site-specific preconstruction plant surveys in the identified suitable habitat areas along the Action Alternative licensed by the Board to document the presence or absence of federally listed plants and the extent of impacts (if identified) to inform potential mitigation requirements, should the Board license an Action Alternative (Chapter 7, *Mitigation and Minimization Measures*). Further, OEA is recommending the Coalition work with USFWS on potential compensatory mitigation based on the results of the preconstruction federally listed plant surveys (Chapter 7, *Mitigation and Minimization Measures*).

Plant Germination and Growth

The movement of heavy equipment and supplies during construction could compact the soil, which would affect plant germination and growth within the project footprint. Compaction is caused when soil particles are squeezed together, making soils denser, oxygen-deprived, and less able to absorb water (Alabama Cooperative Extension System 2013). This condition would prevent seeds from germinating and would make it difficult for roots to penetrate the soil surface. Vegetation removal and soil compaction would expose soil to erosion caused by rain and overland stormwater runoff, which could reduce soil quality and negatively affect vegetation within and beyond the rail corridor, including federally listed plants. To minimize these impacts, OEA is recommending mitigation requiring the Coalition minimize the duration and extent of activity at temporary construction facilities (e.g., staging areas), provide surface treatments to minimize soil compaction, and promote vegetation growth after the facilities are no longer needed to support construction (Chapter 7, *Mitigation and Minimization Measures*).

Noxious and Invasive Weeds

Rail construction could introduce and increase the spread of noxious and invasive weeds in the following ways.

- Construction equipment could carry weed seeds or plant parts from infested areas outside the project footprint into the project footprint.
- Construction equipment could disturb existing weed infestations in the project footprint and cause the spread of these infestations.
- Overburden and cut materials containing weeds could be transferred to off-site locations.
- Fill material could contain weeds.
- Seed mixtures containing weed seeds could be used for revegetation.

Noxious and invasive weeds introduced during construction activities would compete with native vegetation, including federally listed plants. Noxious and invasive weeds are often more aggressive than native vegetation, and the disturbed conditions of a construction site can create an environment (e.g., bare and compact soil, disturbed surfaces) where some noxious and invasive weeds thrive. Noxious and invasive weeds that encroach beyond the rail corridor could out-compete federally listed plants and result in altered vegetation structure, a reduction in plant species richness, and overall disruption of the federally listed plant ecosystem. To address these impacts, OEA is recommending mitigation requiring the Coalition develop and implement a noxious and invasive weed control program that identifies specific construction methods to minimize the introduction and spread of noxious weeds, potentially including the use of sterile ballast, weed-free seed straw, mulching, and hydroseeding materials (Chapter 7, *Mitigation and Minimization Measures*).

Dust Deposition

The operation of construction equipment would generate fugitive dust from loose soil. Accumulation of fugitive dust on federally listed plants in or near the project footprint could affect plant growth by inhibiting photosynthesis and reducing plant density and plant diversity. Increased dust could cause some noxious weeds to colonize and disrupt the overall plant ecosystem. The magnitude and duration of dust exposure, tolerance of native vegetation and federally listed plants, and aggressiveness of noxious weeds would determine vegetation response and the intensity of impacts. However, any dust accumulation on federally listed plants would be temporary and would last only for the duration of construction. The impact of fugitive dust would also be minimized by OEA's recommended mitigation requiring the Coalition to use water for fugitive dust-suppression controls during construction (Chapter 7, *Mitigation and Minimization Measures*).

Accidental Spills of Hazardous Materials

Accidental release of hazardous materials during construction, such as an inadvertent spill of gasoline or oil when fueling or storing construction equipment, could damage federally listed plants and affect plant growth. The extent of the impact would depend on the type and volume of the material spilled, the location, and the plants affected. Because construction activities would not involve using or storing large volumes of hazardous materials, OEA expects that any uncontained spills of hazardous materials during construction would be small and would affect a limited area.

Impacts associated with spills of hazardous materials would be minimized by the implementation of a SWPPP and best management practices, as would be required by the Coalition's NPDES permit and OEA's recommended mitigation (Chapter 7, *Mitigation and Minimization Measures*).

6.4.1.2 Operations

The primary operation activities that could affect federally listed plants are maintenance, incidental pollutant discharges from train operation, and wildfires. Total rail traffic on the proposed rail line would range from 3.68 to 10.52 trains per day, on average. The number of trains per day would not change the types of operation impacts, but it could affect the frequency of the impact (e.g., more trains could result in increased maintenance activities) or increase the chance of the impact occurring (e.g., more trains could increase the risk of sparking a wildfire).

Maintenance Activities

Maintenance activities would include controlling vegetation and maintaining tracks and other features in the rail line footprint, which could affect federally listed plants that may be present. These activities would be infrequent and brief. Vegetation would be periodically cleared or trimmed in the corridor, which could permanently alter vegetation. For example, shrub vegetation that would be continuously cleared for maintenance could convert to herbaceous vegetation. Maintenance activities could disturb the ground surface or result in leaks and spills of fuels, oils, or lubricants from maintenance vehicles and equipment. Any mobilized sediment, spilled chemicals, or petroleum products could reach adjacent federally listed plants, affecting plant density and diversity and degrading the plant ecosystem on a localized scale. However, the area of vegetation that could be affected would be small, and maintenance activities would be infrequent and brief. As discussed previously, OEA is recommending mitigation requiring the Coalition prevent and remediate spills during rail operations, which would minimize impacts on vegetation related to spills during maintenance activities (Chapter 7, *Mitigation and Minimization Measures*).

Pollutant Deposition

Rail operations would release pollutants that could affect federally listed plants. The two most important types of pollutants associated with rail transport are polycyclic aromatic hydrocarbons (PAHs) and heavy metals (Wilkomirski et al. 2011). PAHs occur naturally in air, water, and soil but can also be manufactured. They are found in substances such as asphalt, oil, coal, and creosote (Agency for Toxic Substances and Disease Registry 1995). The main sources of PAHs around rail lines are substances used for rolling stock use, such as machine grease, fuel oils, and transformer oils (Wilkomirski et al. 2011). Heavy metals in emissions and rail car materials can build up on plants and in soil near rail lines (Wilkomirski et al. 2011). Stormwater discharges from the railbed and access roads could convey low concentrations of these pollutants to vegetated areas. Some plant species accumulate and tolerate PAHs (Simonich and Hites 1994 in Liu et al. 2009). However, PAHs can also stunt plant growth and affect root physiology (Liu et al. 2009). Heavy metals may inhibit growth and damage plant physiology, but plants also have resistance mechanisms against toxic effects (Cheng 2003). Any releases of PAHs and heavy metals associated with rail operations would be localized and could result in the degradation of federally listed plants within the rail line footprint. OEA does not expect that these pollutants would affect federally listed plants outside of the rail line footprint.

Wildfire

Trains can contribute to wildfires by providing an ignition source. The two most common ignition sources associated with railroads are exhaust sparks (carbon particles, such as chunks or flakes) emitted from the locomotive engine and hot brake shoe fragments (California Department of Forestry and Fire Protection et al. 1999). With the advent of composition brake shoes, brake-shoe sparks and fragments are much less common, unless the shoe is worn out (California Department of Forestry and Fire Protection et al. 1999).

Several factors are important for assessing where exhaust sparks are most likely to occur. These include how long a locomotive has been idling, where it accelerates and decelerates, and where downgrades are located (California Department of Forestry and Fire Protection et al. 1999). When a locomotive is idling or operating at minimum power, carbon particles can build up in the locomotive. When power is turned up after a period of idling or operating at minimum power, those carbon particles can be ejected out of the locomotive. Locomotives are most likely to idle or operate at minimum power in rail yards, on sidings, while negotiating downgrades and decelerating for a stop or for a restricted speed zone (California Department of Forestry and Fire Protection et al. 1999). Exhaust-spark fires are most likely to occur at yard exits and sidings, at locations where long downgrades change to level or upgrade track, and where the rail line grade changes from level to steep upgrade track (California Department of Forestry and Fire Protection et al. 1999).

Any of the Action Alternatives would require sidings (Chapter 2, *Description of the Proposed Project*, Table 2-8), which would increase the potential for locomotive carbon particle buildup and emissions. The locomotive would also be stopped or operating at minimum power when materials would be loaded into rail cars at the terminus points of the rail line. Many grade changes would occur along the Action Alternatives that could contribute to carbon particle buildup and emissions.

If rail operations were to start a fire, impacts on federally listed plants would vary, depending on the conditions at the time of the wildfire and on prevention and suppression efforts. Some wildfires alter vegetation structure in relatively subtle ways (reducing litter and dead herbs in small areas). Other wildfires change nearly every aspect of the vegetation structure. Woody plants may be stripped of foliage and killed; litter and organic matter may be consumed, exposing mineral soil; and underground structures, such as roots and rhizomes, may be killed (e.g., in most coniferous trees) or rejuvenated (e.g., in many grass and shrub species, aspen, and oak) (Forest Service 2000b).

The probability of a train-induced wildfire along the Action Alternatives would be very low for several reasons, including improvements in locomotive technology and the fact that trains make up a small percentage of fire starts (Table 6-2). In addition, the fire risk for much of the action areas is considered very low, low, or moderate (Table 6-3), and in the action areas that overlaps suitable *sclerocactus* habitat the risk is low and very low (Figure 6-1); there are no areas defined as very high fire risk (Table 6-2, Figure 6-1). However, there is still fire risk and OEA is recommending mitigation requiring the Coalition develop and implement a wildfire management plan in consultation with appropriate state and local agencies, including local fire departments. The plan should incorporate specific information about operations, equipment, and personnel on the rail line that might be of use in case a fire occurs and should evaluate and include, as appropriate, site-specific techniques for fire prevention and suppression (Chapter 7, *Mitigation and Minimization Measures*).

Table 6-2. Wildfires in Utah (1980–2016)

Cause of Fire	Number of Fires	Percent of Fires	Acres Burned
Lightning	6,668	73.9	451,385
Equipment Use	105	1.2	37,910
Smoking	164	1.8	993
Campfire	1,280	14.2	62,250
Debris Lighting	65	0.7	8,544
Railroad	22	0.2	413
Arson	183	2.0	9,160
Children	84	0.9	1,269
Miscellaneous	451	5.0	110,975
Total	**9,022**	**100**	**682,899**

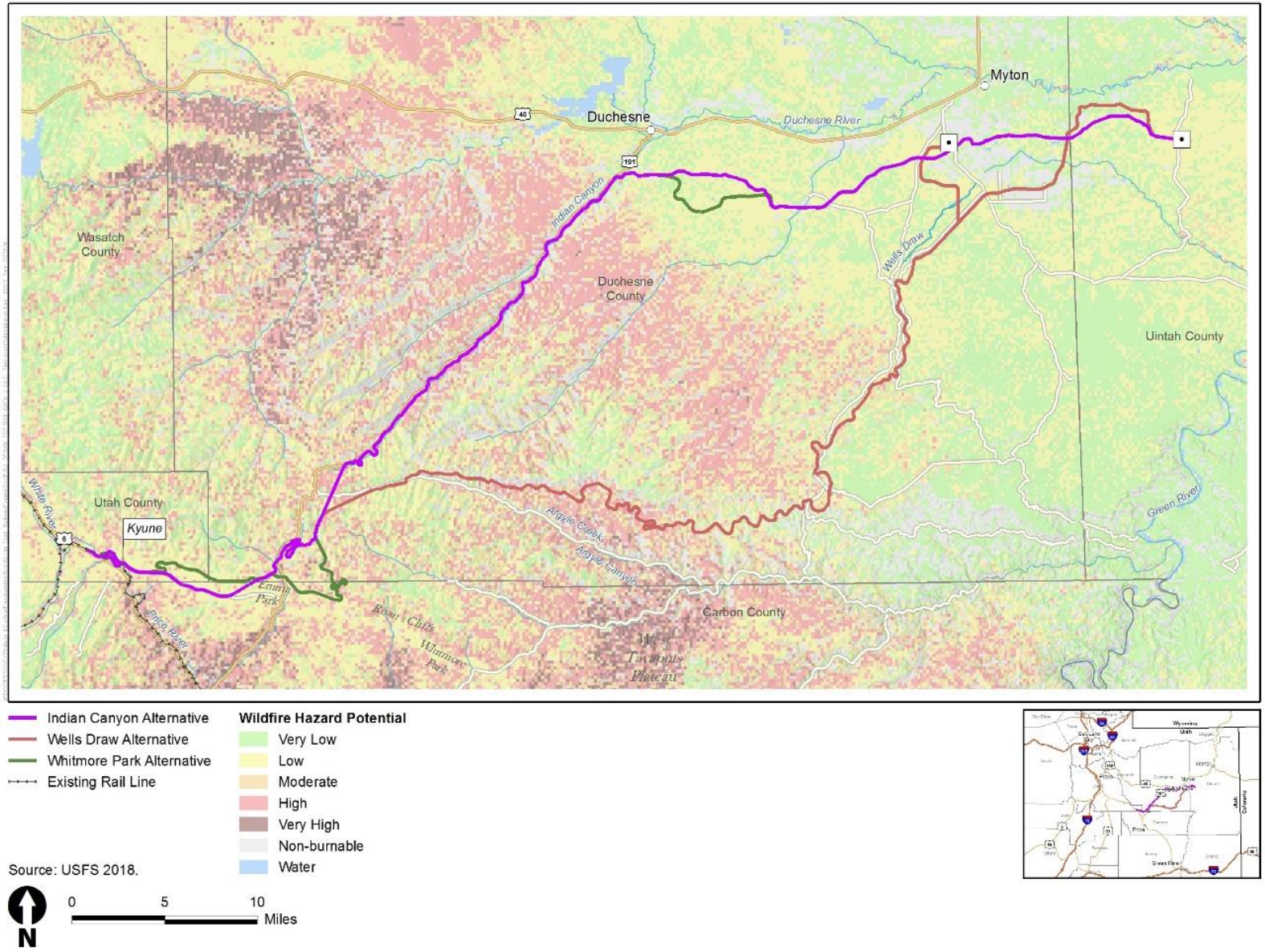
Notes:
Source: USGS 2019

Table 6-3. Wildfire Hazard Potential in the Action Areas (acres)

Wildfire Hazard Potential Class	Action Alternative		
	Indian Canyon	Wells Draw	Whitmore Park
Very low	2,002.4	2,589.7	2,106.2
Low	4,678.4	5,173.7	5,106.4
Moderate	761.7	1,643.0	987.0
High	786.0	1,617.7	675.8
Very high	--	--	--
Nonburnable	1,292.5	1,658.2	1,256.3
Water	--	0.3	--

Notes:
Source: Forest Service 2018

Figure 6-1. Wildfire Hazard Potential along the Action Alternatives



Accidental Spills of Hazardous Materials

Oil could spill from a tanker car onto federally listed plants should a train accident or derailment occur. Section 6.1.2.3, *Accidents and Spills of Hazardous Materials*, discusses the probability of an oil spill occurring during operations and the characteristics of Uinta Basin crude oil that limits its spread when spilled in the natural environment. If cleanup and oil removal were to commence immediately after a spill, impacts on wetland functions would be minimized. However, some permanent and temporary impacts on federally listed plants could occur during cleanup, which could result in the loss of plants and establishment and spread of noxious and invasive weeds. OEA's recommended mitigation regarding the prevention and treatment of spills would minimize these potential impacts (Chapter 7, *Mitigation and Minimization Measures*).

An accidental release of other hazardous materials during operations (e.g., fuel leaks from locomotives or maintenance vehicles) could affect federally listed plants if they were exposed to the contaminant, which could cause loss of individual plants. OEA expects that any release of hazardous materials during operations would be small and would affect a limited area. To minimize potential impacts related to accidents and spills of hazardous materials, OEA is recommending mitigation requiring the Coalition obtain an NPDES permit and implement an SWPPP and best management practices (e.g., sediment barriers), as required by the NPDES permit (Chapter 7, *Mitigation and Minimization Measures*). These measures would help contain a release of hazardous materials and would facilitate rapid cleanup should a spill occur.

6.4.2 Impact by Plant Species

Construction and operation of any of the Action Alternatives would affect special status species, as described in Section 6.4.1, *Impacts Common to Federally Listed Plants*. Table 6-4 quantifies the impact on federally listed plants in the project footprint for each Action Alternative. The Wells Draw Alternative it outside of the range of Barneby ridge-cress; therefore, the alternative would have no impact on the species.

Table 6-4. Permanent Impact to Federally Listed Plant Species Suitable Habitat (acres)

Plant Species	Indian Canyon[b]	Wells Draw[b]	Whitmore Park[b]
Barneby ridge-cress Pinyon-juniper habitat	66.0	--	131.6
Barneby ridge-cress white shale habitat	8.8	--	20.7
Pariette cactus	504.7	550.0	504.7
Pariette cactus/ Uinta Basin hookless cactus[a]	60.5	--	60.5
Uinta Basin hookless cactus	504.7	550.0	504.7
Ute ladies'-tresses	4.3	0.1	4.2

Notes:

[a] This is a Core 2 conservation area. These areas are subsumed by the suitable habitat areas and are core conservation areas that include dense aggregations of the species. No Core 1 Conservation Areas are within the project footprint.

[b] For purposes of this BA, permanent impacts include areas within the rail line footprint and temporary footprint where all construction and operations activities would occur.

6.4.3 Impact Summary for Federally Listed Plants

Construction and operation of the proposed rail line could affect federally listed plants. While some impacts may be short-term and temporary (e.g., dust), there would be unavoidable direct and permanent long-term impacts on suitable habitat for federally listed plants from clearing and fill placement during construction (Table 6-4). For this BA and ESA Section 7 consultation, OEA is conservatively assuming the identified suitable federally listed plant habitats are occupied; therefore, impacts on suitable habitat equal impacts on federally listed plants (until preconstruction surveys indicate otherwise, should the Board license an Action Alternative). Notably, the ESA Section 9 take prohibition does not apply to federally listed plants, except that it is illegal under Section 9(a)(2) to remove an endangered plant from federal land, or to take an endangered plant in knowing violation of state law. If a person develops private land, with no federal jurisdiction involved, in accordance with state law, then the potential destruction, damage, or movement of endangered or threatened plants does not violate the ESA. Suitable habitat for Barneby ridge-cress was identified on private and Tribal trust lands; suitable habitat for Pariette cactus and Uinta Basin hookless cactus was identified on private land, Tribal trust land, and BLM-administered land; and suitable habitat for Ute ladies'-tresses was identified on private, Forest Service, and UDOT land.

Chapter 7
Mitigation and Minimization Measures

In its Draft EIS, OEA preliminarily recommends that the Board impose mitigation measures for the proposed project, which would minimize the proposed rail line's impacts on the species addressed in this BA. The Coalition has also submitted a list of volunteer mitigation measures to avoid, minimize, and reduce impacts from the proposed rail line; some of these would minimize impacts on federally listed species. Both OEA's recommended mitigation measures and the Coalition's voluntary mitigation measure include the requirement that the Coalition comply with any conditions and mitigation commitments contained in a Biological Opinion (BO) issued by USFWS for the proposed rail line. OEA is recommending the mitigation and minimization measures in this chapter for USFWS to consider for the BO. These measures would apply to all Action Alternatives, with the following exceptions: 1) the Mexican spotted owl measure in Section 7.1.2.8, *Mexican Spotted Owl*, only applies to the Wells Draw Alternative, and 2) all Barneby ridge-cress measures in Sections 7.1.2.1, *Barneby Ridge-Cress (Suitable Habitat Areas)*, and 7.1.2.2, *Barneby Ridge-Cress (Occupied Habitat Areas)*, do not apply to the Wells Draw Alternative because the alternative is outside of the species' range.

7.1 OEA Recommended Measures

7.1.1 General Measures

- **MM-1.** The Coalition shall conduct preconstruction surveys of federally listed plants (Barneby ridge-cress, Pariette cactus, Uinta Basin hookless cactus, and Ute ladies'-tresses) along the Action Alternative licensed by the Board and after final engineering of that Action Alternative is complete. The Coalition shall design and implement preconstruction surveys in consultation with OEA and USFWS and shall follow the procedures that OEA and USFWS approve.
- **MM-2**. The Coalition shall consult with OEA and USFWS regarding appropriate compensatory mitigation for impacts on federally listed plants that are identified in suitable habitat areas during preconstruction surveys and shall implement the compensatory mitigation that OEA and USFWS approve.
- **MM-3**. The Coalition shall implement measures to reduce collision risks from project-related power communications towers. The Coalition shall incorporate the design recommendations in the USFWS *Recommended Best Practices for Communication Tower Design, Siting, Construction, Operation, Maintenance, and Decommissioning* (USFWS 2018) to avoid or minimize the risk of bird mortality at communications towers.
- **MM-4**. During project-related construction, The Coalition shall minimize, to the extent practicable, soil compaction and related effects (e.g., increase runoff and erosion), and provide surface treatments to minimize soil compaction (e.g., break up compacted soils during reclamation to promote infiltration) and shall take actions to promote vegetation regrowth after facilities (e.g., temporary staging areas) are no longer needed to support construction.
- **MM-5**. The Coalition shall develop and implement a wildfire management plan in consultation with appropriate state and local agencies, including local fire departments. The plan shall incorporate specific information about operation, equipment, and personnel on the rail line that

might be of use in case a fire occurs and shall evaluate and include as appropriate site-specific techniques for fire prevention and suppression.

7.1.2 Species Specific Measures

7.1.2.1 Barneby Ridge-Cress (Suitable Habitat Areas)

- **BRC-1.** The Coalition shall design project infrastructure to minimize impacts within suitable habitat, to the extent practicable.
- **BRC-2.** The Coalition shall place signing to limit off-road travel in sensitive areas.
- **BRC-3.** The Coalition shall stay on designated routes and other cleared/approved areas.
- **BRC-4.** The Coalition shall minimize and clearly define ingress and egress access within suitable habitat.
- **BRC-5.** Prior to construction, the Coalition's project personnel shall be educated about the sensitive nature of the habitat, instructed to stay within the project disturbance area, and instructed on the specific avoidance and minimization measures implemented.
- **BRC-6.** The Coalition shall use only water (i.e., no chemicals, reclaimed production water, oil field brine) for dust abatement within suitable habitat during construction.
- **BRC-7.** The Coalition shall power wash construction vehicles and equipment prior to entering suitable habitat or when moving between infested areas in order to prevent spreading seeds from noxious and invasive species.

7.1.2.2 Barneby Ridge-Cress (Occupied Habitat Areas)

- **BRC-8.** Before and during construction, the Coalition shall have a qualified biologist identify areas of avoidance in the field (e.g., flagging, temporary fencing, rebar).
- **BRC-9.** The Coalition shall have a qualified botanist on site during construction to monitor the surface disturbance activity and assist with implementation of applicable conservation measures.
- **BRC-10.** Within occupied habitat, the Coalition shall design project infrastructure to avoid direct disturbance and minimize indirect impacts to populations and individual plants:
    a. The Coalition shall design project infrastructure to minimize impacts within occupied habitat, to the extent practicable.
    b. The Coalition shall conduct ground disturbing activities that require removal of vegetation to be located a minimum distance of 300 feet from individual plants and/or populations, to the extent practicable.
    c. The Coalition shall incorporate into the project design measures, such as silt fences, hay bales, and similar structures or practices, to avoid water flow and/or sedimentation into occupied habitat and avoidance areas.
- **BRC-11.** The Coalition shall not conduct construction activities from May 1 through June 30 (flowering period) within occupied habitat.

- **BRC-12.** The Coalition shall use only water (i.e., no chemicals, reclaimed production water, oil field brine) for dust abatement within occupied habitat during construction.
- **BRC-13.** The Coalition shall obey a 15-mile-per-hour speed limit on dirt roads within occupied habitat during construction in order to reduce fugitive dust during the time of the year when species, pollinators, and associated habitat are most vulnerable to dust related impacts (April 1–July 31). Speed limit signs shall be posted in restricted areas for project personnel.
- **BRC-14.** The Coalition shall re-vegetate all temporarily disturbed areas with native species comprised of species native to the area and non-native species or seed mixtures approved by USFWS. Seed mixtures may include approved non-native species that are not likely to invade other areas or persist long-term in the habitat. If appropriate for the site, biological soil crusts are recommended to be incorporated into the reclamation process in addition to native seeds.
- **BRC-15.** The Coalition shall develop a project-specific plan with USFWS if ground-disturbing activities occur within 300 feet of plants or populations to offset impacts and monitor individuals or populations.

7.1.2.3 Ute Ladies'-Tresses (Suitable Habitat Areas)

- **ULT-1.** The Coalition shall design project infrastructure to minimize impacts within suitable habitat, to the extent practicable.
- **ULT-2.** During construction, the Coalition shall avoid soil compaction that would impact Ute ladies' tresses habitat, to the extent practicable.
- **ULT-3.** The Coalition shall avoid altering site hydrology and concentrating water flows or sediments into occupied habitat, to the extent practicable.
- **ULT-4.** The Coalition shall place signing to limit off-road travel in sensitive areas.
- **ULT-5.** The Coalition shall stay on designated routes and other cleared/approved areas.
- **ULT-6.** The Coalition shall use geotextile matting to protect vegetation and soils from damage and compaction for equipment operating within suitable habitat.
- **ULT-7.** Prior to construction, the Coalition's project personnel shall be educated about the sensitive nature of the habitat, instructed to stay within the project disturbance area, and instructed on the specific avoidance and minimization measures implemented.
- **ULT-8.** The Coalition shall use only water (i.e., no chemicals, reclaimed production water, oil field brine, etc.) for dust abatement within suitable habitat during construction.
- **ULT-9.** The Coalition shall power wash construction vehicles and equipment prior to entering suitable habitat or when moving between infested areas in order to prevent spreading seeds form noxious and invasive species.

7.1.2.4 Ute Ladies'-Tresses (Occupied Habitat Areas)

- **ULT-10.** Before and during construction, the Coalition shall have a qualified biologist identify areas of avoidance in the field (e.g., flagging, temporary fencing, rebar).
- **ULT-11.** The Coalition shall have a qualified botanist on site during construction to monitor the surface disturbance activity and assist with implementation of applicable conservation measures.

- **ULT-12.** Within occupied habitat, the Coalition shall design project infrastructure to avoid direct disturbance and minimize indirect impacts to populations and individual plants:
    a. The Coalition shall design project infrastructure to minimize impacts within occupied habitat, to the extent practicable.
    b. The Coalition shall conduct ground disturbing activities that require removal of vegetation to be located a minimum distance of 300 feet from individual plants and/or populations, to the extent practicable.
    c. The Coalition shall incorporate into the project design measures, such as silt fences, hay bales, and similar structures or practices, to avoid water flow and/or sedimentation into occupied habitat and avoidance areas.
- **ULT-13.** The Coalition shall not conduct construction activities during the flowering period (typically August–September, depending on location) within occupied habitat.
- **ULT-14.** The Coalition shall obey a 15 mile per hour speed limit on dirt roads within occupied habitat during construction in order to reduce fugitive dust during the time of the year when species, pollinators, and associated habitat are most vulnerable to dust related impacts (July 1–September 31). Speed limit signs shall be posted in restricted areas for project personnel.
- **ULT-15.** The Coalition shall re-vegetate all temporarily disturbed areas with native species comprised of species native to the area and non-native species or seed mixtures approved by USFWS. Seed mixtures may include approved non-native species that are not likely to invade other areas or persist long-term in the habitat.
- **ULT-16.** The Coalition shall develop a project specific plan with USFWS if ground-disturbing activities occur within 300 feet of plants or populations to offset impacts and monitor individuals or populations.

7.1.2.5 Uinta Basin Hookless Cactus and Pariette Cactus (Suitable Habitat Areas)

- **SCL-1.** The Coalition shall conduct ground disturbing activities that require removal of vegetation to be located a minimum distance of 300 feet from individual *Sclerocactus* plants and/or populations, to the extent practicable.
- **SCL-2.** The Coalition shall design project infrastructure to minimize impacts within suitable habitat, to the extent practicable.
- **SCL-3.** The Coalition shall use only water (i.e., no chemicals, reclaimed production water, oil field brine) for dust abatement within the *Sclerocactus* Habitat Polygon during construction.
- **SCL-4.** The Coalition shall implement erosion control measures (e.g., silt fencing) to minimize sedimentation or concentrating water flow to *Sclerocactus* plants and populations located down slope of proposed surface disturbance activities. Such measures should only be installed within the area proposed for disturbance.
- **SCL-5.** The Coalition shall reclaim all temporarily disturbed areas with plant species native to the region, or seed mixtures approved by USFWS.

7.1.2.6 Uinta Basin Hookless Cactus and Pariette Cactus (Core Conservation Area 2)

- **SCL-6.** The Coalition shall conduct ground disturbing activities outside of the reproductive period, April 1–June 30, or as determined by a qualified botanist.
- **SCL-7.** The Coalition shall minimize surface disturbance to minimize impacts to *Sclerocactus* and suitable habitat, to the extent practicable.

7.1.2.7 Uinta Basin Hookless Cactus and Pariette Cactus (Occupied Habitat Areas)

- **SCL-8.** The Coalition shall conduct ground disturbance activities outside of the reproductive period, April 1–June 30 (or as determined by a qualified botanist), when within 300 feet of individual *Sclerocatus* plants and/or populations.
- **SCL-9.** The Coalition shall have a qualified biologist flag *Sclerocactus* avoidance areas (within 25 feet of disturbance edge). Flagging shall be immediately removed following construction activity.
- **SCL-10.** The Coalition shall obey a 15-mile-per-hour speed limit on dirt roads within occupied *Sclerocactus* habitat during construction in order to reduce fugitive dust during the time of the year when *Sclerocactus* species, pollinators, and associated habitat are most vulnerable to dust related impacts (March 1–August 31). Speed limit signs shall be posted in restricted areas for project personnel and signing shall be posted to limit off-road travel in sensitive areas.
- **SCL-11.** The Coalition shall use only water (i.e., no chemicals, reclaimed production water, oil field brine) for dust abatement within occupied habitat during construction.
- **SCL-12.** The Coalition shall have a qualified botanist on site during construction to monitor the surface disturbance activity and assist with implementation of applicable conservation measures.
- **SCL-13.** If new surface disturbance occurs within occupied habitat, the Coalition shall contribute to the *Sclerocactus* Conservation Fund. Proof of payment shall be provided to the action agency prior to construction. The payment shall be calculated based on acres of disturbance using the USFWS "2016 Ecological Restoration Mitigation Calculation Guidelines for impacts to *Sclerocactus wetlandicus* and *Sclerocactus brevispinus* Habitat."
  Funds shall be paid to:

  Sclerocactus Conservation Fund - BLM
  Impact-Directed Environmental Accounts National Fish and Wildlife Foundation
  1133 Fifteenth Street NW, Suite 1100
  Washington, DC 20005

7.1.2.8 Mexican Spotted Owl

- **MSO-1.** The Coalition shall conduct Mexican spotted owl surveys in the moderate-quality habitat along the Wells Draw Alternative should the Board license the Wells Draw Alternative and the Coalition choose to construct the Wells Draw Alternative. The survey method shall be determined in consultation with USFWS.

7.2 Coalition Voluntary Measures

- **VM 1.** Prior to initiating any project-related construction activities, the Coalition will develop a spill prevention, control, and countermeasures plan in consultation with federal, tribal, state, and local governments. The plan shall specify measures to prevent the release of petroleum products or other hazardous materials during construction activities and contain such discharges if they occur. In the event of a spill over the applicable reportable quantity, the Coalition will comply with its spill prevention, control, and countermeasures plan and applicable federal, state, local, and tribal regulations pertaining to spill containment, appropriate clean-up, and notifications.
- **VM 2.** The Coalition will ensure that gasoline, diesel fuel, oil, lubricants, and other petroleum products are handled and stored to reduce the risk of spills contaminating soils or surface waters. If a petroleum spill occurs in the project area as a result of rail construction, operations, or maintenance and exceeds specific quantities or enters a water body, the Coalition (or its agents) will be responsible for promptly cleaning up the spill and notifying responsible agencies in accordance with federal, state, and tribal regulations.
- **VM 3.** The Coalition will prepare a hazardous materials emergency response plan to address potential derailments or spills. This plan will address the requirements of the Pipeline and Hazardous Materials Safety Administration and FRA requirements for comprehensive oil spill response plans. The Coalition will distribute the plan to federal, state, local, and tribal emergency response agencies. This plan shall include a roster of agencies and people to be contacted for specific types of emergencies during rail construction, operation and maintenance activities, procedures to be followed by particular rail employees, emergency routes for vehicles, and the location of emergency equipment.
- **VM 4.** In the event of a reportable hazardous materials release, the Coalition will notify appropriate federal, state, and tribal environmental agencies as required under federal, state, and tribal law.
- **VM 5.** The Coalition will limit ground disturbance to only the areas necessary for project-related construction activities.
- **VM 6.** The Coalition will submit a notice of intent to request permit coverage under Utah Pollutant Discharge Elimination System Construction General Permit UTRC00000 for construction stormwater management. The Coalition will submit an application for coverage under the NPDES stormwater construction permits pursuant to Section 402 of the Clean Water Act for construction stormwater management on tribal land. The Coalition will develop a stormwater pollution prevention plan, which will include construction best management practices to control erosion and reduce the amount of sediment and pollutants entering surface waters, groundwater, and waters of the U.S. The Coalition will require its construction contractor(s) to follow all water quality control conditions identified in all permits, including the Section 404 permit from the Corps and the Section 401 Water Quality Certification from the UDEQ and the U.S. Environmental Protection Agency.
- **VM 7.** The Coalition will revegetate disturbed areas, where practical and in consultation with the Ute Indian Tribe as applicable, when construction is completed. The goal of reclamation will be the rapid and permanent re-establishment of native ground cover on disturbed areas to prevent soil erosion, where feasible. If weather or seasonal conditions prevent vegetation from being quickly re-established, the Coalition will use measures such as mulching, erosion-control

blankets, or dust-control palliatives to prevent erosion until vegetative cover is established. The Coalition will monitor reclaimed areas for 3 years. For areas where efforts to establish vegetative cover have been unsuccessful after 1 year, the Coalition will reseed annually for up to 3 years as needed.

- **VM 8.** The Coalition will comply with any conditions and mitigation commitments contained in a biological opinion for sensitive species that could potentially be impacted by the project.
- **VM 9.** The Coalition will prepare a noxious and invasive weed control plan in consultation with the Ute Indian Tribe where applicable. Where practical, the Coalition will include the policies and strategies in Utah's *Strategic Plan for Managing Noxious and Invasive Weeds* when designing response strategies for noxious and invasive weeds.
- **VM 10.** The Coalition will comply with any conditions and mitigation commitments contained in a biological opinion for sensitive plant species that could potentially be impacted by the project.

Chapter 8
Effects Determination

This chapter presents the effects determinations for each species based on the information presented in Section 4.3, *Species Descriptions and Occurrences*, Chapter 6, *Effects Analysis*, and Chapter 7, *Mitigation and Minimization Measures*. The effects determinations and supporting information presented in the chapter are described in the context of all Action Alternatives (except where noted), but as stated in Chapter 1, *Introduction*, OEA is consulting with USFWS only on the Coalition's preferred alternative - Whitmore Park Alternative. While OEA believes that the effects determinations presented in this Chapter would be the same for all Action Alternatives (with possible exception of Mexican Spotted Owl for Wells Draw Alternative, as noted below), if the Board decides to license an Action Alternative other than the Whitmore Park Alternative, OEA would use the information in this BA and reinitiate Section 7(a)(2) consultation with USFWS.

8.1 Canada Lynx

The information, analysis, mitigation, and minimization presented in this BA was the basis of the finding that the proposed project warrants an effects determination of ***May Affect, Not Likely to Adversely Affect*** for Canada lynx.

A determination of ***May Affect*** is warranted based on the following rationale.

- The presence of suitable Canada lynx habitat in the action areas in the higher elevations around Ashley National Forest.
- The potential presence of a dispersing Canada lynx in the action areas.
- The potential disturbance from construction and operation noise and human activities that could result in disturbance or displacement of Canada lynx.
- The potential for injury or mortality during construction and operations due to collisions and spills of hazardous materials.
- The potential for displacement due to removal, alteration, or degradation of habitat during construction and operations.

A determination of ***Not Likely to Adversely Affect*** is warranted based on the following rationale.

- Canada lynx habitat in the action areas is limited, marginal (at best), and disjunct from any typical Canada lynx habitat. In addition, this habitat is above a proposed tunnel and would not be physically disturbed in any way.
- There are no LAUs mapped in the action areas, which means the action areas are unoccupied Canada lynx habitat, is considered peripheral Canada lynx habitat, and not considered to contain a Canada lynx habitat sufficient to support a breeding female.
- There are no historic Canada lynx locations anywhere in or around the action areas in Ashley National Forest.

- The presence of a Canada lynx in the action areas would be rare. Utah has not historically supported and does not currently support resident lynx populations because the habitat in the state is naturally incapable of supporting persistent populations; historical and future occurrences in Utah most likely represent occasional dispersing lynx.

8.2 Mexican Spotted Owl

The information, analysis, mitigation, and minimization presented in this BA was the basis of the finding that the proposed project warrants an effects determination of ***May Affect, Not Likely to Adversely Affect*** for Mexican spotted owl.

A determination of ***May Affect*** is warranted based on the following rationale.

- The presence of suitable Mexican spotted owl habitat in the action areas.
- The potential disturbance from construction and operation noise and human activities that could result in disturbance or displacement of Mexican spotted owl.
- The potential for injury or mortality during construction and operations due to collisions and spills of hazardous materials.
- The potential for displacement due to removal, alteration, or degradation of habitat during construction and operations.
- Encounters with project infrastructure that could result in injury or death.

A determination of ***Not Likely to Adversely Affect*** is warranted based on the following rationale.[9]

- The majority of the habitat in the action areas is considered low quality, which consists of either nonhabitat or habitat that would unlikely support the species.
- There is no high-quality Mexican spotted owl habitat in the action areas.
- The presence of a Mexican spotted owl in the action areas would be unlikely given the results of the habitat suitability surveys. In addition, there are no known Mexican spotted owl observations in the action areas or within a 2-mile distance of the Action Alternatives.

[9] For the Wells Draw Alternative, OEA would reconsider this effects determination if the Board were to license the Wells Draw Alternative. While OEA believes the effects determination would have a high likelihood of remaining the same due to the small, isolated, and disconnected nature of the moderate-quality habitat identified that reduces the likelihood of occupancy, OEA has included a measure in Chapter 7 that would require the Coalition to conduct Mexican spotted owl surveys in these moderate-quality habitat areas if the Board were to license the Wells Draw Alternative. Those surveys would inform whether or not OEA would change the effects determination for the species.

8.3 Upper Colorado River Basin Fish (Colorado Pikeminnow, Humpback Chub, Bonytail, Razorback Sucker)

The information, analysis, and use of the ESA Section 7 Upper Colorado Basin Fish decision tree presented in this BA was the basis of the finding that the proposed project warrants an effects determination of ***May Affect, Likely to Adversely Affect*** for Upper Colorado Basin Fish.

A determination of ***May Affect*** is warranted based on the following rationale.

- The proposed rail line would use water from source(s) in the Upper Columbia River Basin that that would contribute to water depletions that would adversely affect species through reduced water quantity and degradation of water quality.

A determination of ***Likely to Adversely Affect*** is warranted based on the following rationale.

- The water volume necessary for construction of the proposed rail line would exceed 0.1 acre-feet.
- The water source is not considered historic.

8.4 Federally Listed Plants (Barneby Ridge-Cress, Pariette Cactus, Uinta Basin Hookless Cactus, Ute Ladies'-Tresses)

The information, analysis, mitigation, and minimization presented in this BA was the basis of the finding that the proposed project warrants an effects determination of ***May Affect, Likely to Adversely Affect*** for federally listed plants (Barneby ridge-cress,[10] Pariette cactus, Uinta Basin hookless cactus, Ute ladies'-tresses).

A determination of ***May Affect*** is warranted based on the following rationale.

- The presence of suitable habitat identified in the action areas.
- Removal of and damage to plants during construction from clearing, filling, and trampling, and during maintenance activities during operations.
- Adverse effects from dust generated during construction and the establishment and spread of noxious weeds and invasive species.
- The potential for plant damage during construction and operations due to spills of hazardous materials.
- The potential for wildfire starts during rail operations that could result in damage or mortality of plants.

A determination of ***Likely to Adversely Affect*** is warranted based on the following rationale.

[10] The effects determination for this species is not applicable to the Wells Draw Alternative because this alternative is outside of species' range.

- Unavoidable direct and permanent long-term impacts on suitable habitat for federally listed plants from clearing and fill placement during construction (Table 6-4). For this BA and ESA Section 7 consultation, OEA is conservatively assuming the identified suitable federally listed plant habitats are occupied; therefore, impacts on suitable habitat equal impacts on federally listed plants (until pre-construction surveys indicate otherwise, should the Board license an Action Alternative).

Chapter 9
Cumulative Effects

Cumulative effects are those effects of future state or private activities, not involving federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation (50 C.F.R. § 402.02). The definition applies only to ESA Section 7 analyses and should not be confused with the broader use of this term in NEPA or other environmental laws. ESA Section 7 regulations require the federal action agency to provide an analysis of cumulative effects when requesting initiation of formal consultation. Because OEA has made an effects determination of "may affect, likely to adversely affect" for the four Upper Colorado Basin Fish Species and the four federally listed plants, OEA is addressing cumulative effects on these species only. There is no ESA requirement for federal action agencies to address cumulative effects for informal consultation, as confirmed by *Conservation Congress v. U.S. Forest Service*, No. 12-16452 (9th Cir. 2013). Therefore, Canada lynx and Mexican spotted owl are not addressed in this chapter.

9.1 Future Cumulative Actions in the Action Area

OEA developed a list of cumulative actions based on the list of cumulative actions developed for the EIS, and determined which cumulative actions were reasonably certain to occur and fit the narrower definition of cumulative actions under ESA. The following two sections summarize the cumulative projects and actions addressed in the EIS, followed by a discussion on projects that would be considered cumulative actions under the ESA's cumulative definition for the federally listed species addressed.

9.1.1 Oil and Gas Development

Oil and gas refer generally to fluid petroleum products that are derived from organic material deposited millions of years ago and now lie underground. Over time, heat and pressure transformed those raw materials into energy-rich hydrocarbon liquids and gases. Oil and gas are produced by drilling wells into the formations that contain oil and gas resources. After well sites are selected they are prepared for drilling by construction of a well pad and supporting infrastructure. Drilling involves a drill rig, associated equipment such as pumps, and truck trips. After the wells are drilled, they are "completed" using a variety of techniques, depending on the characteristics of the formation, such as hydraulic fracturing to create fractures in the rock. This allows fluids to more freely flow from the formation into the well, where the fluids flow up the well to the surface. Oil, gas, and/or water produced by a well are separated at the well site or are transported to nearby facilities for separation. OEA anticipates that, if the Coalition were to construct and operate the proposed rail line, some of the crude oil produced in the Basin would be trucked from wells to rail terminals near Myton and Leland Bench for loading into trains.

The Coalition estimates that rail traffic on the proposed rail line would range from 3.68 trains per day (low rail traffic scenario) and 10.52 trains per day (high rail traffic scenario), on average, depending on future market conditions. The trains would primarily transport crude oil and would have the capacity to ship between approximately 130,000 and 350,000 barrels of oil each day, on average, out of the Basin. The actual volume of oil transported on the proposed rail line and the

number of trains would depend on various independent variables and factors including, but not limited to, general domestic and global economic conditions, commodity pricing, and the strategic and capital investment decisions of oil producers and their customers (Coalition Response to IR#2).

For the analysis of potential cumulative impacts, OEA developed two potential scenarios for future oil and gas development in the Basin that correspond to the Coalition's estimated range of rail traffic. Under the low oil production scenario, total oil production in the Basin would increase by an average of 130,000 barrels per day from historical production levels. Under the high oil production scenario, total oil production in the Basin would increase by an average of 350,000 barrels per day. Historical production has varied substantially year-to-year. Where the analysis required quantification of historical production, OEA used 90,000 barrels per day as a conservative baseline level of production, which is slightly lower than the maximum historical production from the Basin of 94,000 barrels per day. Although OEA expects that the proposed rail line would divert some oil that in the past has been trucked to terminals outside the Basin to rail transportation, OEA assumed, for the purposes of the cumulative impacts analysis, that all oil transported on the proposed rail line would come from new production. This is a conservative assumption because it may overstate total future oil production in the Basin and, therefore, potential cumulative impacts.

OEA assumed that future oil and gas development, including well drilling and operation along with construction and operation of related facilities, such as pipelines, would occur throughout the Basin in the fields shown in Figure 9-2. The exact locations of new oil and gas development would depend on many factors, including domestic and global demand, as well as future decisions by private, state, tribal, and federal owners of mineral rights in the Basin. The Monument Butte Oil and Gas Development Project, which is proposed to develop up to 5,750 oil and gas wells in an area located about 6 miles south of Myton, Utah, is an example of a proposed oil and gas development project in the region (BLM 2016). Crude oil produced from the Monument Butte project wells potentially could be transported on the proposed rail line.

9.1.1.1 Well Development

To assess the impacts of increased oil and gas development as part of the cumulative analysis, OEA estimated the number of oil wells that would need to be constructed and operated to satisfy the expected increased oil production volume scenarios of 130,000 or 350,000 barrels per day, respectively. Based on consultation with the Utah Geological Survey (UGS) regarding current drilling technologies and methods in the Basin, OEA estimated that new horizontal wells would produce 366 barrels of crude oil per day, on average, during the first year of production (Vanden Berg pers. comm.). OEA reviewed data on vertical wells drilled between 2014 and 2018 from the Utah Division of Oil, Gas, and Mineral (UDOGM) to estimate an average initial production rate of 66 barrels of crude oil per day for new vertical wells. OEA used historical well data from UDOGM's completion and production databases to create a 15-year oil production decline curve for horizontal and vertical wells.[11] Based on consultation with UGS, OEA assumed that 20 percent of the new wells drilled each

[11] A duration of 15 years was selected to balance competing analysis interests: (1) a robust decline curve and (2) an accurate estimate of well production volumes. A longer duration captures a more complete decline curve, including the later period when a well's annual production begins to plateau from year to year. Conversely, a shorter duration captures the production volumes of wells that were more recently drilled in the Basin. Compared to wells drilled in earlier years, these wells are more likely to use the same technologies and drilling processes of future wells analyzed under the cumulative analysis and are, therefore, more representative. Balancing the tradeoffs of optimizing for (1) and (2), OEA selected a 15-year period of well volume data (e.g., 2004 to 2019).

year would be vertical wells and 80 percent would be horizontal wells (Vanden Berg pers. comm.; Utah Geological Survey 2019).

OEA used the initial production rates, decline curves, and estimated ratio of horizontal wells to vertical wells to calculate the annual production rate of an average well in each year of its lifetime and the number of wells that would need to be constructed each year to meet the oil production volume expected in the respective scenarios. For simplicity, OEA assumed it would take 1 year to construct all the wells before they would start producing oil at their expected annual rate. In the second year of the project (i.e., the first year of production), the wells constructed in the first year would be operating at the production volume needed to satisfy each of the two oil production scenarios.

By the third year of the project (i.e., the second year of production) the wells constructed in the first year would not produce enough oil to satisfy the production scenarios because the average well production volume decreases over a well's lifetime. Therefore, additional wells would need to be constructed in the second year of the project to supplement the reduced production from the wells constructed in the first year. In the third year, the old (first year) and new (second year) wells combined produce the volume needed to satisfy the production scenarios, and so forth. As the decline curve starts to plateau in later years, fewer and fewer wells need to be constructed each year. OEA chose year 15 of the analysis to represent "steady state" development, as this was the analysis year when the number of wells constructed per year was closest to the number of new producing wells in that year (i.e., wells that were constructed in the 14th year). Production from an oil well will steadily decline. By year 15, OEA estimated that an average horizontal well could produce approximately 40 barrels per day and an average vertical well could produce approximately 7 barrels per day

Based on this approach, steady state annual development under the low oil production scenario requires construction of approximately 80 wells, plus production from 83 wells for each year of production (i.e., under the steady state assumption there are 83 wells of each "vintage" steady state year). Therefore, the steady state total number of wells in the field in any year is 83 wells times 15 years, or 1,245 wells. Under the high oil production scenario, there would be 217 wells constructed and 222 wells operating for each steady state year of production. Therefore, the steady state total number of wells in the field in any year is 222 wells times 15 years, or 3,330 wells. As an example, Table 9-1 and Table 9-2 display the estimated annual well development for the low oil production scenario and high oil production scenario, respectively.

Table 9-1. Estimated Well Development for the Low Oil Production Scenario

Year	New Wells in Production	Wells in Construction	Total Wells in Production	Oil Produced (Bbl/day)[a]
1	0	425	0	>=130,000
2	425	184	425	>=130,000
3	184	148	609	>=130,000
4	148	130	757	>=130,000
15 (Steady state)	83	80	1,245[b]	>=130,000

Notes:

[a] The number of wells in production and construction in any given year is based on satisfying the condition that at least 130,000 barrels of oil be produced per day.

[b] Steady state development represents the average year of production. For the steady state year, total wells in production are equal to new wells in production (83) multiplied by the number of years from initial development (15).

Sources: UDOGM 2020; UGS 2019; Vanden Berg pers. comm.

Bbl = barrel

Table 9-2. Estimated Well Development for the High Oil Production Scenario

Year	New Wells in Production	Wells in Construction	Total Wells in Production	Oil Produced (Bbl/day)[a]
1	0	1,144	0	>=350,000
2	1,144	496	1,144	>=350,000
3	496	398	1,640	>=350,000
4	398	349	2,038	>=350,000
15 (Steady state)	222	217	3,330[b]	>=350,000

Notes:

[a] The number of wells in production and construction in any given year is based on satisfying the condition that at least 350,000 barrels of oil be produced per day.

[b] Steady state development represents the average year of production. For the steady state year, total wells in production are equal to new wells in production (222) multiplied by the number of years from initial development (15).

Sources: UDOGM 2020; UGS 2019; Vanden Berg pers. comm.

Bbl = barrel

OEA's estimate of oil well development exceeds the estimates provided by the Coalition. In response to an Information Request from OEA, the Coalition estimated that, on average, under the low oil production scenario there would be 130 wells operating and 29 under construction and under the high oil production scenario there would be 350 wells operating and 70 under construction. OEA's independent analysis, described above, determined that the number of producing wells would likely need to be much greater than the Coalition's estimates in order to produce the low and high oil production scenario volumes.

OEA's estimates of future oil production represent a reasonably foreseeable development scenario based on historical data from the Basin and consultation with UGS. Oil and gas development technology is continually evolving. Changes in technology could affect the number of wells, the typical well mix (vertical/directional vs horizontal), and the volume of oil produced per well that would be carried on the proposed rail line in the future.

9.1.1.2 Support Facilities and Truck Trips

Ancillary facilities that support oil field development are expected to include access roads, electric power distribution lines, well pads, surface or subsurface pipelines, and storage tanks. Construction activities would involve vegetation clearing and surface disturbance for the construction of new wells and ancillary facilities. The extent of surface disturbance for construction of new wells and ancillary facilities would depend, in part, on whether the new wells represent in-fill development within an existing field, including additional well drilling from an existing well pad, or new development within a previously undeveloped area of the field.

OEA assumed that increased production for oil transported on the proposed rail line would originate from oil fields in the Basin, as shown in Figure 9-2. OEA estimated that 622 truck trips per day would transport oil from oil fields to the terminals under the low oil production scenario and

1,675 truck trips per day would transport oil from oil fields to the terminals under the high oil production scenario.

9.1.2 Rail Terminals

If the Coalition were to construct and operate the proposed rail line, OEA anticipates that new rail terminals would be constructed at the terminus points near Myton and Leland Bench to transfer commodities between trucks and rail cars. The Coalition is not seeking Board authority to construct new rail terminals as part of the proposed rail line. The Coalition anticipates that third parties, such as firms that specialize in oil field or freight logistics, would construct and operate the new rail terminals if the proposed rail line is authorized. This has been a common practice for development of truck-to-rail crude oil terminal facilities, for example in North Dakota, as the movement of crude oil in the United States by rail has increased with increasing oil production (Opendatasoft 2019). Because new rail terminals are not part of the Coalition's proposal or the Board's decision-making in this proceeding, OEA has only general information regarding the potential design of those facilities based on similar projects elsewhere in the country.

Truck-to-rail terminal facilities providing for tank car loading and storage can have several layouts, including the following.

- Multiple relatively short (e.g., 20 to 40 cars) tracks
- One or more long (e.g., 10,000 feet) tracks
- One or more loop tracks

If adequate and suitable land is available, loop tracks are often used for handling bulk commodity trains, such as crude oil, coal, or grain because loop tracks minimize the train movements required, which creates efficiencies. OEA reviewed publicly available information on terminals in North Dakota and Colorado and found that terminals with the capacity to load between a few trains per week up to multiple trains simultaneously range in size from a few hundred to more than 500 acres and that size is not correlated with train-loading capacity. The review of topography and current land development indicate that the Myton Bench and Leland Bench areas could be suitable for loop track facilities plus sidings to accommodate rail-car storage and handling of other commodities. Based on OEA's review of information on existing terminals in other areas of the country, OEA assumed that terminals at Myton Bench and Leland Bench would be 400 acres each and would have two double-tracked loops with 10,000 feet of additional car storage track, for both the low oil production scenario and high oil production scenario.

The rail terminal developers would determine the design and features of any terminals, where storage and transfer of crude oil between trucks, tanks, and rail cars would be subject to the Spill Prevention, Control, and Countermeasure regulations at 40 C.F.R. Part 112. Based on existing terminals developed elsewhere, the basic features for such terminals, in addition to the required rail track, would include facilities for offloading crude oil from tanker trucks, heated crude oil storage tanks and associated piping and pumping, multiple rail tank car loading, facilities for handling non-oil commodities, administration and utility buildings, and access roads. A mobile crane would be used for loading/offloading non-oil commodities, and open (lay down) areas would be provided for temporary storage of such commodities. These features are illustrated in Figure 9-1.

Figure 9-1 Example Crude Oil Rail Loading Terminal

As shown, multiple tanks would be anticipated as part of each terminal facility. Air emissions from tanks and unloading/loading would be controlled by flaring and/or vapor combustion units based on each terminal's permit issued by the Utah Department of Environmental Quality. To account for congestion, weather, or other considerations and potential sources of schedule delay, OEA anticipates that terminals would have approximately 5 days of oil-storage capacity.

For the low oil production scenario, OEA assumed that each terminal would have four heated tanks with an approximate 350,000-barrel total storage capacity. Each terminal would have the capacity to load, on average, one train (approximately 70,000 barrels) per day. OEA assumed that the facility would be able to unload at least six trucks simultaneously, load crude oil into at least 12 rail cars simultaneously, and load a unit train in approximately 12 hours. OEA further assumed, again based on readily available information on North Dakota and Colorado terminals, that each facility would employ approximately 50 personnel, and peak construction employment would be 300 for each facility.

For the high oil production scenario, OEA assumed each terminal would have eight heated tanks with an approximate 900,000-barrel total storage capacity and would have the capacity to load three trains per day. OEA assumed the facility would be able to unload at least 12 trucks simultaneously, load crude oil into at least 24 rail cars and two trains simultaneously, and load a unit train in approximately 12 hours. OEA further assumed that each facility would employ approximately 125 personnel, and that peak construction employment would be 300.

9.1.3 Other Reasonably Foreseeable Cumulative Projects and Actions

Table 9-3 describes other reasonably foreseeable projects and actions that OEA considered in the cumulative impacts analysis. Figure 9-2 shows the locations of cumulative projects and actions.

Table 9-3. Other Projects and Actions Analyzed

Map ID	Project Name	Description	Status/ Timing	Federal Nexus?
Watershed Improvement Projects				
1	Ashley Valley Watershed Project, Uintah County (Uintah County 2019)	Improvements under consideration will address flood protection, watershed protection, agricultural water management, and public recreation development. An evaluation of potential alternatives and associated environmental impacts is required and will be documented in the form of an Environmental Assessment.	In planning phase	Yes
2	Pelican Lake Sediment Control Construction, Uintah County (Utah WRI 2019)	Pelican Lake has severe sedimentation issues, which need to be addressed to help restore this once Blue Ribbon Fishery. Three specific projects have been identified and are undergoing engineering and design in FY 2018. Projects include creation of a sediment catch basin near Pelican Lake, improvements to the 1.5 miles of canal directly above Pelican Lake, and creation of a Biofilter/wetland complex at the mouth of Pelican Lake.	2021	Yes
3	2019 Watershed Plan, Duchesne County (DCWCD 2019)	The plan involves implementing several component projects to increase water supply, improve water quality, and enhance the environment. The plan includes the following: • Yellowstone Feeder Canal • Roosevelt and Ballard Flood Control • Gray Mountain Canal • Dry Gulch Irrigation Company • Uintah Indian Irrigation Project • Myton City Flood Control • Dry Gulch Irrigation Company • Altamont City Flood Control • Lake Fork Western Canal • South Boneta Canal • Uintah Basin Irrigation Company • Duchesne County Noxious Weed Control	Environmental Assessment contract awarded (USDA-NRCS)	Yes

Map ID	Project Name	Description	Status/ Timing	Federal Nexus?
Road Improvement Projects				
4	Woods Road Reconstruction, Uintah County (UDOT 2019a)	This project will reconstruct the existing roadway to improve pavement condition and improve safety including wider shoulders. FA-1552 / Start Milepost: 13.424 - End Milepost: 15.454.	Construction in 2023	Yes
5	1500 East Improvements in Ballard, Uintah County (UDOT 2019b)	The project will widen the existing roadway to provide shoulders that will accommodate pedestrian and bicycle access. The project will also address drainage and rehabilitate the roadway surface. FA-1550 / Start Milepost: 7.405 - End Milepost: 8.408.	Construction in 2022	Yes
6	State Street Road Widening, Duchesne County (UDOT 2019c)	The project will widen the existing roadway to provide shoulders that will accommodate pedestrian and bicycle access. The project will also address drainage and rehabilitate the roadway surface. Located on State Street between 800 South and 300 South.	Construction in 2022	Yes
7	Myton Main Street, Duchesne County (UDOT 2019d)	The project will reconstruct the existing roadway by milling existing asphalt surface and replacing with 4-inch surface course. Shoulders will be modified to tie into existing curb and gutter to improve drainage. Located on Main Street, Myton, Utah.	Construction in 2022	Yes
8	US 40; Pleasant Valley to Myton, Duchesne County (UDOT 2019e)	The project will extend the life of the pavement by milling the existing asphalt surface and replacing it with 3 inches of hot-mix asphalt. Located along US 40/ Start Milepost: 103.494 – End Milepost: 106.282.	Construction start date 2020	Yes
9	SR-87 Roadside Improvements, Duchesne County (UDOT 2019f)	The project will construct safety improvements along SR-87 from MP 10.8 to MP 19.7 including shoulder widening and guardrail and drainage improvements. Located along US 40/ Start Milepost: 103.494 – End Milepost: 106.282.	Construction start date March 2020	Yes
10	Road Preventative Treatment, Carbon County (UDOT 2019g)	This project will rehabilitate the road at 1900 East and 600 North to 800 North by smoothing out rough spots, adding a layer of asphalt, and improving the shoulders. Located at Milepost: .63 - End Milepost: .995 near Price, Utah.	Scheduled for 2020	Yes

Map ID	Project Name	Description	Status/ Timing	Federal Nexus?
11	US 6/100 North Interchange Improvements, Carbon County (UDOT 2019h)	Carbon County is making landscaping enhancements at the 100 North Interchange along US 6 in Price. This is a multiple agency and entity partnership effort. UDOT is contributing $50,000 toward landscape materials. Located along US 6 / Start Milepost: 239.5 - End Milepost: 240.2.	In design phase	No
12	Rehabilitation of SR-157; Kenilworth Road and SR-139; Spring Glen Road, Carbon County (UDOT 2019i)	The project involves the rehabilitation of high-volume road damage at SR-157; Kenilworth Road and SR-139; Spring Glen Road. Located along SR-157; Kenilworth Road and SR-139; Spring Glen Road.	Proposed construction start date June 2020	Yes
13	1900 East Phase III, 600 North to 800 North, Carbon County (UDOT 2019j)	This project will apply cost-effective treatments before major road rehabilitation is required. The preservation efforts may include resurfacing the roadway and/or bridges and sealing cracks, improving ride quality and increasing skid resistance. Located at 1900 East Phase III, 600 North to 800 North.	Proposed construction start date July 2020	Yes
14	Ridge Road Reconstruction, Carbon County (Coalition 2019b)	Ridge Road has experienced deterioration due to the heavy volume of truck traffic. Deterioration of the road has caused public safety concerns for vehicles using the road. Reconstructing the road for the heavier truck volume will increase public safety for users of the road and relieve truck traffic congestion in other residential areas throughout Carbon County.	Feasibility evaluation in process	No
15	US 6, MP 200 Bridge Ride Fix, Utah County (UDOT 2019k)	This project will fix the rough ride over the structures near Milepost 200 in SF Canyon. Located along US 6 / Start Milepost: 200.6 - End Milepost: 200.8.	In planning phase	Yes
Facility and Other Infrastructure Improvements				
16	Roosevelt Airport Improvements, Duchesne County (FAA 2019)	Federal Aviation Administration grant for runway, taxiway, lighting and drainage improvements at the Roosevelt Municipal Airport.	Grant awarded in 2019	Yes

Map ID	Project Name	Description	Status/ Timing	Federal Nexus?
17	Peerless Port of Entry, Carbon County (UDOT 2019l)	This project involves building new and improving existing maintenance, visitor and welcome facilities. Located along US 6 / Start Milepost: 236.83 - End Milepost: 237.83.	Construction start date March 2020. End date November 2020.	No
18	Roosevelt Library, Duchesne County (Duchesne County Library System 2018)	A 14,000-square-foot new library will be built in Roosevelt or an 8,500-square-foot expansion of the existing library to adequately facilitate and promote growth and learning opportunities for the Roosevelt community.	Feasibility study completed in 2018. The library board has purchased the softball fields at Central Park for the new library's location.	No
19	MS4 Stormwater Infrastructure Improvements, Carbon County (UDOT 2019m)	This project includes stormwater infrastructure improvements along SR-10 / Start Milepost: 67.666 - End Milepost: 67.785.	Construction nearly complete	No
Forest Service Actions				
20	Badlands Lop and Scatter Project, Duchesne County (Forest Service 2019a)	The wildlife habitat improvement project targets the removal of encroaching conifers (pinyon, juniper, and Douglas fir), located on the South Unit of Ashley National Forest. Treatment would be done through mechanical means using chainsaws. The project is located on the west side of the South Unit of the Duchesne/Roosevelt Ranger District of Ashley National Forest, approximately 20 miles southwest of Duchesne Utah.	Under analysis	Yes

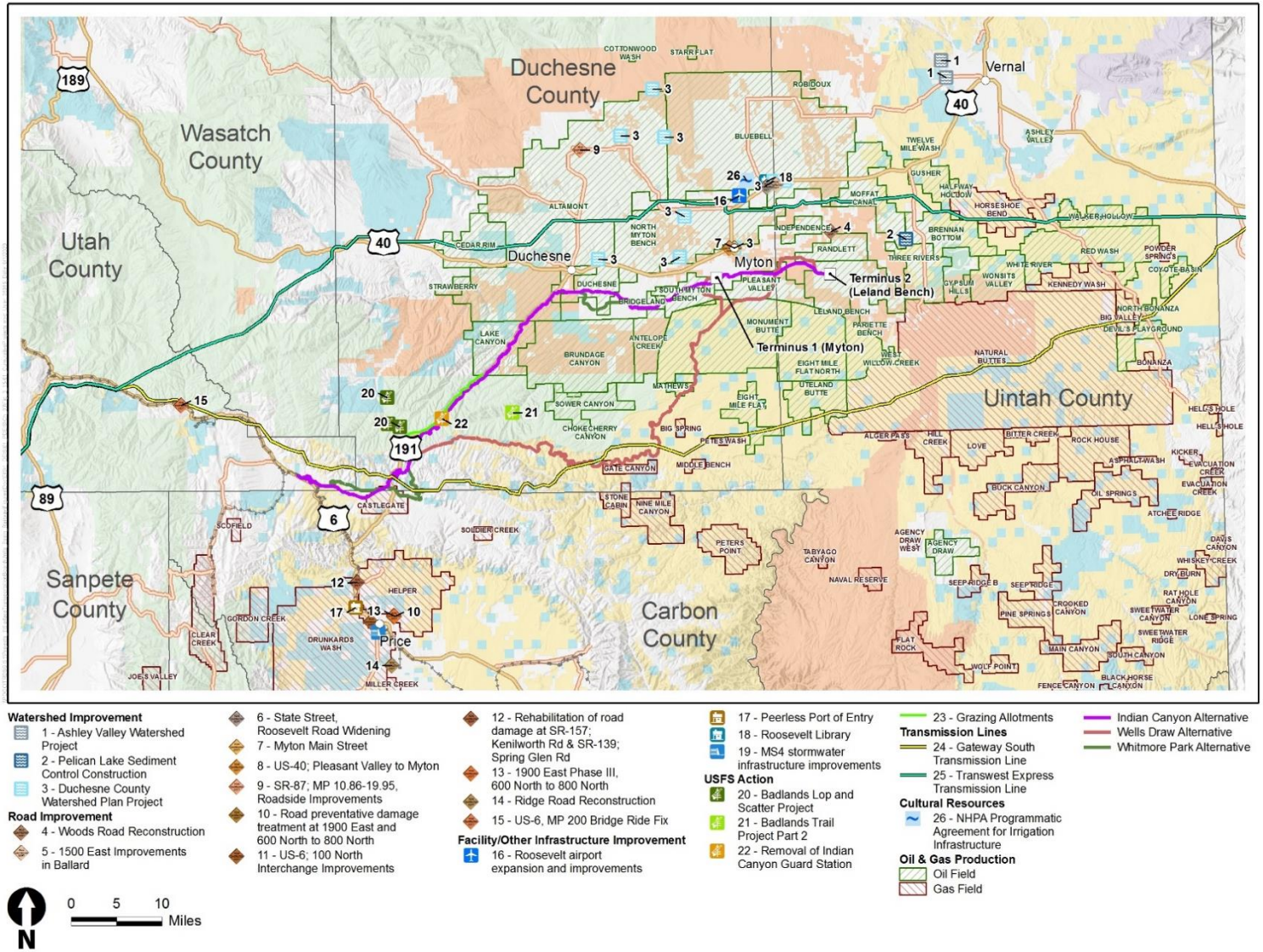
Map ID	Project Name	Description	Status/ Timing	Federal Nexus?
21	Badlands Trail Project – Part 2, Duchesne County (Forest Service 2019b)	The project includes construction of an off-highway vehicle trail connection on the South Unit of the Duchesne/Roosevelt Ranger District. The segment would connect Sowers Canyon Road to Forest Service Road 497. This segment would be approximately 3.3 miles. The project is located south of US 40 at the junction of Sowers Canyon Road and Forest Service Road 497, approximately 6.15 miles south of the Bridgeland turn-off.	Under analysis	Yes
22	Removal of Indian Canyon Guard Station, Duchesne County (Groves pers. comm.)	The project involves removal of a historic guard station along US 191 South. Located along US 191 South at the confluence of Mill Hollow and Left Fork Indian Canyon.	Implementation in 2020	Yes
23	Ashley National Forest Grazing Allotments, Duchesne County (Groves pers. comm.)	Left Fork Indian and Mill Hollow cattle grazing allotments run the full length of US 191 on Ashley National Forest.	Ongoing 6/2016–10/2015	Yes
Interstate Electric Power Transmission Projects				
24	Gateway South Transmission Line (BLM 2016)	PacifiCorp proposes to construct, operate, and maintain a 500-kilovolt overhead, single-circuit, alternating-current, transmission line. Spans across several counties.	FEIS published 2016; estimated line in service for customers is 2024	Yes
25	TransWest Express Transmission Project (TransWest Express 2019)	The TransWest Express Transmission Project will provide the transmission infrastructure and transmission capacity necessary deliver approximately 20,000 GWh/yr of renewable energy generated in Wyoming to the Desert Southwest region, including Arizona, Nevada, and southern California.	In permitting and siting process; estimated construction 2020–2023	Yes

Map ID	Project Name	Description	Status/ Timing	Federal Nexus?
26	National Historic Preservation Act Programmatic Agreement for Irrigation Infrastructure	The PA is an NHPA Section 106 PA for a programmatic approach to the mitigation of adverse effects of projects on canals in Utah. The PA allows project proponents for projects with a federal nexus in Utah and adverse effects on canals to contribute a set amount of funding to a research project at Utah State University in lieu of piecemeal mitigation through individual Section 106 Memoranda of Agreement for each project. Utah State University then uses the funding for broad research and public outreach about the history of canals and irrigation in Utah.	Signed in 2020	Yes

Notes:

Utah WRI = Utah Watershed Restorative Initiative; FY = fiscal year; DCWCD = Duchesne County Water Conservancy District; USDA-NRCS = U.S. Department of Agriculture National Resource Conservation Service; UDOT = Utah Department of Transportation; US 6 = U.S. Highway 6; SR = State Route; US 40 = U.S. Highway 40; US 191 = U.S. Highway 191; BLM = Bureau of Land Management; Forest Service = U.S. Forest Service; GWh/yr = gigawatts per year; PA = Programmatic Agreement; NHPA = National Historic Preservation Act

Figure 9-2 Foreseeable Future Actions



9.1.4 Reasonably Certain Future Non-Federal Actions

9.1.4.1 Federally Listed Plants (Barneby Ridge-Cress, Pariette Cactus, Uinta Basin Hookless Cactus, Ute Ladies'-Tresses)

OEA determined that two nonfederal actions are reasonably certain to occur in the federally listed plants' action areas. Based on the information in Section 9.1.1, *Oil and Gas Development*, Section 9.1.2, *Rail Terminals*, and Section 9.1.3, *Other Reasonably Foreseeable Cumulative Projects and Actions,* the only cumulative projects and actions that would overlap with the federally listed plants' action areas would be oil and gas development, rail terminals, the Gateway South Transmission Line, and the Forest Service's grazing allotments. The Board has no jurisdiction over the any of these cumulative projects and cannot impose any measures to avoid, minimize, or mitigate their effects on federally listed plant species. However, with the exception of oil and gas development (on private or state lands only with no federal nexus) and the rail terminals, all of these reasonably certain future actions are federal actions because they require federal approval for the action to proceed. Oil and gas development would need BLM approval on BLM-administered lands or private lands with BLM mineral estate, grazing allotment management required Forest Service approval, and the Gateway South Transmission Line required BLM approval; these actions already have or will need to go through the ESA Section 7 consultation process.

The overlap of the action areas with the areas where oil and gas development could occur (i.e., in active fields on private or state lands) would be a narrow area between the proposed rail line's project footprint and the edge of the action area, which is very narrow; therefore, it is not anticipated that an oil or gas pad would be developed immediately adjacent to the proposed rail line within the action area. However, it is possible that related oil and gas development could occur in this narrow area (e.g., an access road crossing of the rail line). Based on the locations of potential oil and gas development areas in the action areas, there is suitable habitat for all federally listed plants that could occur in areas of oil and gas development. Depending on the size, exact location, layout, and associated facilities of an oil and gas well, it is possible that these suitable habitats could be affected. If oil and gas project designs do not avoid these suitable habitat areas and these areas are occupied by federally listed plants, then oil and gas development would directly affect individual plants; impacts would be similar to those described for the proposed rail line (Section 6.4.1, *Impacts Common to Federally Listed Plants*). Therefore, oil and gas development *may affect, and is likely to adversely affect* federally listed plants. Overall, this does not change OEA's effects determination of ***May Affect, Likely to Adversely Affect*** for federally listed plants for the proposed rail line.

As stated in Section 9.1.2, *Description of Rail Terminals*, because the new rail terminals are not part of the Coalition's proposal or the Board's decision-making in this proceeding, OEA has only general information regarding the potential design of these facilities based on similar projects elsewhere in the country. Therefore, OEA is assuming a rail terminal size would range from a few hundred acres up to 500 acres. Based on the locations of the rail terminals, the only federally listed species that could occur in or around the rail terminal locations is the Ute ladies'-tresses. The rail terminal locations are outside of the known ranges and suitable habitats of the remaining federally listed plants (Figures 4-3, 4-11, and 4-12); therefore, construction and operation of the rail terminals would have *no effect* on these species. Ute ladies'-tresses habitat suitability surveys were conducted through a large part of the Myton terminal location because the action areas for the Indian Canyon Alternative and Whitmore Park Alternative go through the Myton terminal location. No suitable Ute ladies'-tresses habitat was found in this part of the action area. However, a review of the National

Wetland Inventory indicates some emergent wetland in the general vicinity of the terminal location, which can be suitable habitat for Ute ladies'-tresses. Depending on the size, exact location, and layout of the terminal, it is possible that these wetland areas could be affected. If rail terminal design does not avoid these wetland areas and the wetlands support Ute ladies'-tresses, then the Myton rail terminal would directly affect individual plants; impacts would be similar to those described for the proposed rail line (Section 6.4.1, *Impacts Common to Federally Listed Plants*). Therefore, the Myton rail terminal *may affect, and is likely to adversely affect* the Ute ladies'-tresses. No suitable Ute ladies'-tresses habitat was identified in the action areas that overlap the Leland Bench terminal location. A review of the National Wetland Inventory in areas beyond the action area and in the vicinity of the terminal location indicate no wetlands; therefore, suitable Ute ladies'-tresses habitat is unlikely to be present. Construction and operation of the Myton terminal would not change OEA's overall effects determination of ***May Affect, Likely to Adversely Affect*** for Ute ladies'-tresses for the proposed rail line.

9.1.4.2 Upper Colorado River Basin Fish Species (Colorado Pikeminnow, Humpback Chub, Bonytail, Razorback Sucker)

OEA determined that several cumulative projects and actions would overlap with the Upper Colorado River Basin Fish Species' action area. The cumulative effect of these projects must also overlap with the impact type and impact mechanisms with the proposed rail line to be considered a cumulative effect, so any cumulative project or action that could result in water depletions in the Upper Colorado River Basin and is a nonfederal action could result in cumulative effects (i.e., water quantity and quality impacts related to depletions). Based on the information in Section 9.1.1, *Oil and Gas Development*, Section 9.1.2, *Rail Terminals*, and Section 9.1.3, *Other Reasonably Foreseeable Cumulative Projects and Actions,* cumulative actions or projects that do not have a federal nexus and could result in water depletions and related effects in the Upper Colorado River Basin include oil and gas development (on private or state lands only with no federal nexus); rail terminals; US 6/100 North Interchange Improvements, Carbon County; Ridge Road Reconstruction, Carbon County; Peerless Port of Entry, Carbon County, Roosevelt Library, Duchesne County; and MS4 Stormwater Infrastructure Improvements, Carbon County. The Board has no jurisdiction over the any of these cumulative projects and cannot impose any measures to avoid, minimize, or mitigate their effects on Upper Colorado River Basin Fish Species. The Peerless Port of Entry project is to be completed in November 2020 and MS4 Stormwater Infrastructure Improvements is nearly completed based on budget expenditure, so these projects would not qualify as future actions for ESA cumulative effects assessment. In addition, based on past oil and gas development, most new oil and gas development would likely occur on federal lands (i.e., BLM) or private lands with BLM mineral estate, which would require federal approvals; however, the areas where oil and gas development could occur in active fields on private or state lands with no federal nexus. The remaining cumulative projects and actions reviewed have a federal nexus in the form of federal funding (e.g., U.S. Department of Transportation for the UDOT projects) or federal approval (e.g., Section 404 permitting for Pelican Lake Sediment Control Construction project); therefore, these projects already have gone through or will need to go through the ESA Section 7 consultation process.

The potential rail terminal locations are not within, adjacent to, or near any surface waters or streams that are known to support Upper Colorado Basin Fish Species. However, it is possible that construction and operation of the rail terminals could require surface or groundwater withdrawals in the Upper Colorado River Basin. Therefore, Upper Colorado River Basin Fish could be affected by construction and operation of the rail terminals by adversely affecting water quantity and quality in

the basin. Similarly, oil and gas development could require surface or groundwater withdrawals for construction and operations in the Upper Colorado River Basin, which could affect Upper Colorado River Basin Fish. Oil and gas development impacts on Upper Colorado River Basin Fish would depend on well pad location and volume of surface or groundwater withdrawals. The remaining cumulative projects and actions could require some surface and/or groundwater withdrawals for dust suppression during construction, but are unlikely to require any for operations; these withdrawals would be short-term and temporary, lasting only the duration of construction. Overall, these potential cumulative effects on Upper Colorado River Basin Fish do not change OEA's overall effects determination of ***May Affect, Likely to Adversely Affect*** for the proposed rail line. In addition, the RIPRAP was established to mitigate the effects of water depletions on Upper Colorado River Basin Fish.

Because the Upper Columbia River Basin Fish Species' action area is so large (i.e., the Upper Colorado River Basin because of depletion impacts), there are potential cumulative projects and actions that could occur outside the area reviewed in the EIS. The Upper Colorado River Basin covers parts of five states, including Wyoming, Colorado, Utah, Arizona, and New Mexico, which is a vast area for surface and groundwater withdrawals to occur. USGS recently issued a report (2018) on water use and trends in the Colorado River Basin between the years 1985 and 2010. The data for the last year of the study (i.e., 2010) showed that water withdrawals in the Upper Columbia River Basin totaled 8.30 million acre-feet. Greater than 96 percent of the withdrawals were from surface waters, and from 1985 to 2010, withdrawals averaged 98 percent from surface-water sources. Water withdrawals in the Upper Colorado River Basin are used for hydroelectric, irrigation, industrial, commercial, thermoelectric, public supply, wastewater returns, interbasin transfers, mining, aquiculture, and livestock purposes. However, 92 percent of the withdrawals are used for hydroelectric (69 percent), irrigation (13 percent), and interbasin transfers (10 percent). OEA is assuming that future water withdrawals in the Upper Colorado River Basin will be similar in both volume and purpose as withdrawals in the past; however, it is difficult to determine what percent of these future withdrawals would have a federal nexus, and therefore, what percent would be excluded from this cumulative effects analysis. The volume of water estimated to construct the Action Alternatives compared to basin-wide withdrawals is very small. The Coalition estimates that 1,650 acre-feet of water would be needed to construct the Indian Canyon Alternative; 8,890 acre-feet to construct the Wells Draw Alternative; and 1,750 acre-feet to construct the Whitmore Park Alternative. These withdrawal volumes represent about 0.1 percent or less for all of the Action Alternatives compared to the annual withdrawals from the Upper Colorado River Basin. Therefore, this does not change OEA's overall effects determination of ***May Affect, Likely to Adversely Affect*** for Upper Colorado River Basin Fish for the proposed rail line. In addition, the RIPRAP was established to mitigate the effects of water depletions on Upper Colorado River Basin Fish.

Chapter 10
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Groves, Kristy. Ashley National Forest, Duchesne/Roosevelt Ranger District. U.S. Forest Service. February 5, 2020—Email regarding cumulative projects and plans from to Merin Swenson, ICF.

Vandenberg, Michael. Personal communication. Energy and Minerals Program Manager, Senior Geologist. Utah Geological Survey. October 2, 2020—Email to Joshua Wayland, Surface Transportation Board, Office of Environmental Analysis.