3.4 Biological Resources

This section describes the impacts on biological resources that would result from construction and operation of the proposed rail line. Biological resources considered in this section include wildlife, fish, vegetation, and special status species. Special status species include species that are listed or proposed to be listed as threatened or endangered under the Endangered Species Act (ESA); candidate species for ESA listing; bald and golden eagles; and sensitive species listed by BLM, the Forest Service, the state of Utah, or the Ute Indian Tribe. The subsections that follow describe the study areas, data sources, the methods OEA used to analyze potential impacts, the affected environment, and the potential impacts of the proposed rail line on biological resources.

3.4.1 Analysis Methods

This subsection identifies the study areas, data sources, and analysis methods OEA used to analyze biological resources.

3.4.1.1 Study Areas

The study areas for biological resources consists of the following three~~two~~ areas.

- **Field survey study area.** The field survey study area corresponds to where the Coalition conducted field surveys for biological resources during spring, summer, and fall of 2019, and spring and summer of 2020. The Coalition designed the field survey study area to encompass the rail line footprint and temporary footprint.[1] The field survey study area consists of a 1,000-foot-wide corridor along much of the rail centerline (500 feet on either side of the centerline) for each Action Alternative. The field survey study area is wider than 1,000 feet in a few areas where permanent or temporary disturbance would extend slightly further than 500 feet from the rail centerline. Appendix G, *Biological Resources Figures*, Figure G-10, shows the field survey study area.

  The field survey study area also includes a supplemental survey study area that is specific to communications towers and access roads. The supplemental survey study area consists of a 1,000-foot-wide corridor along access road centerlines and a 500-foot-wide buffer around communications towers. This supplemental survey study area makes up a small percent of the field survey study area (approximately 2 percent or less for all Action Alternatives).

- **Noise disturbance study area.** The noise disturbance study area is the area in which wildlife could be affected by train noise. This 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)

[1] 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. 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. The *project footprint* is the combined area of the rail line footprint and temporary footprint, both of which would be disturbed during construction, comprising where construction and operations of the proposed rail line would occur.

exhibit a response to train noise (FRA 2005). Section 3.4.1.3, *Analysis Methods*, provides an additional explanation regarding why OEA is using this noise level. 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 (locomotive engine and wheel on rail) noise and 460 feet for horn noise at grade crossings. The noise disturbance study area is subsumed by the field survey study area.

- **Greater sage-grouse study area.** The greater sage-grouse study area extends a distance of 3.1 miles from the centerline of the proposed rail line. This corresponds to the distance at which anthropogenic land use activities associated with linear features (e.g., rail lines) have been observed to affect sage-grouse leks (USGS 2014), which are areas where greater sage-grouse congregate during the spring breeding season.

3.4.1.2 Data Sources

OEA reviewed the following data sources to determine the potential impacts on biological resources that could result from construction and operation of the proposed rail line.

- U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) Environmental Conservation Online System.
- Forest Service, USFWS, BLM, UDWR, and Utah Natural Heritage Program data, including lists of special status species within or near the study areas.
- Data on fish species and fish habitat in the study areas from UDWR, the UDEQ, scientific literature, and regional watershed program documentation.
- Data on big game in the study areas from UDWR, including big game state management plans, UDWR-mapped big game habitats, and general locations of big game movement corridors mapped by UDWR big game biologists.
- The Coalition's *Biological Resources Baseline Environment Technical Memorandum: Uinta Basin Railway* (Coalition 2020a).[2] In addition to the sources listed above, the Coalition used the following additional data sources to characterize biological resources in the field survey study areas in its technical memorandum:
  - U.S. Geological Survey (USGS) GAP/LANDFIRE National Terrestrial Ecosystems data set (USGS 2016 as cited in Coalition 2020a).
  - NatureServe Explorer.
  - Utah Conservation Data Center database (UDWR 2019a).

[2] The Coalition conducted biological resources field surveys along the Action Alternatives throughout the spring, summer, and fall of 2019. OEA independently verified the fieldwork and data collection by reviewing field methods, conducting site visits, observing fieldwork, and reviewing survey reports and the underlying data. Additional information on the Coalition's field survey methodology can be found in the *Biological Resources Baseline Environment Technical Memorandum: Uinta Basin Railway* (Coalition 2020a), which is available to the public on the Board's website (www.stb.gov) and the Board-sponsored project website (www.uintabasinrailwayeis.com).

- The Coalition's habitat field survey reports for the following federally threatened species:[3]
  - Barneby Ridge-cress Habitat Evaluation Memorandum (Coalition 2020b).
  - Ute Ladies'-tresses Habitat Evaluation Memorandum (Coalition 2020c).
  - Mexican Spotted Owl Habitat Evaluation Memorandum (Coalition 2020d).
- Federal, state, and local wildland fire occurrence data (Forest Service~~USGS~~ 2017a~~9~~).
- Forest Service Wildlife Hazard Potential data (Forest Service 2020a~~18~~).
- Forest Service invasive plants database (Forest Service 2020b~~a~~).
- *Ashley National Forest Assessment Tribal Uses Report* (Forest Service 2017b).

3.4.1.3 Analysis Methods

OEA used the following methods to analyze impacts on biological resources in the study areas.

- **OEA used the Coalition's field survey information and federal agency GIS data to describe biological resources in the field survey study area and supplemental survey study area, respectively.** OEA used the Coalition's *Biological Resources Baseline Environment Technical Memorandum: Uinta Basin Railway* (Coalition 2020a) and data sources listed in Section 3.4.1.2, *Data Sources*, to identify the wildlife, fish, and vegetation species (including special status species) that are known to be present or that have the potential to be present in the field survey study area. OEA independently verified the Coalition's fieldwork and data collection by reviewing field methods, conducting site visits, observing fieldwork, and reviewing survey reports and the underlying data. To describe biological resources in the supplemental survey study area, which makes up 2 percent or less of the field survey study areas for the Action Alternatives, OEA used GIS datasets; the GIS data are subsumed by the Coalition's data presented in Section 3.4~~3~~.2, *Affected Environment*, and Section 3.4~~3~~.3, *Environmental Consequences*.
- **OEA estimated the amount of disturbance to vegetation and wildlife habitat.** OEA used GIS to estimate the amount of vegetation and wildlife habitat that would be permanently (e.g., fill and excavation) and temporarily (e.g., staging areas) affected by the proposed rail line.
- **OEA qualitatively assessed construction and operation impacts.** OEA qualitatively evaluated the potential impacts on biological resources from construction and operation of the proposed rail line, including temporary impacts from rail construction activity (e.g., temporary clearing of habitat), permanent impacts from the presence of rail infrastructure (e.g., habitat fragmentation), impacts from operation of the rail line itself (e.g., train-wildlife collisions), potential impacts on wildfire occurrence and suppression, and the potential for noxious and invasive weeds to establish and spread. The analysis was informed by OEA's review of scientific literature on the life-history and habitat requirements for each potentially affected species;

[3] The Coalition conducted habitat suitability surveys for three federally listed species in 2020: Barneby ridge-cress, Ute ladies'-tresses, and Mexican spotted owl. Additional information on the survey methodology can be found in the *Barneby ridge-cress Habitat Evaluation Memorandum* (Coalition 2020b), *Ute Ladies'-tresses Habitat Evaluation Memorandum* (Coalition 2020c), and *Mexican Spotted Owl Habitat Evaluation Memorandum* (Coalition 2020d), which are available to the public on the Board's website (www.stb.gov) and the Board-sponsored project website (www.uintabasinrailwayeis.com).

federal and state wildlife and land management agency plans and policies for the study areas; and the professional judgment of OEA's biological resources team.

- **OEA addressed greater sage-grouse impacts through an interagency working group.** To inform the analysis of impacts on greater sage-grouse (*Centrocercus urophasianus*) and implications of the BLM and state greater sage-grouse management plans, OEA convened a working group of federal and state agencies with expertise on greater sage-grouse and used information from the working group to prepare the analysis.
- **OEA assessed noise impacts on wildlife.** OEA used noise thresholds established by FRA to determine the potential for noise impacts on wildlife. FRA uses an SEL of 100 dBA (refer to Section 3.6, *Noise and Vibration*, for a description of SEL and dBA) as a noise threshold above which animals (domestic and wild) exhibit a response to train noise (FRA 2005). FRA established this threshold after reviewing available studies that relate actual noise levels to effects in domestic and wild animals. OEA estimated the 100 dBA SEL to extend approximately 350 feet from the rail line for wayside noise and approximately 460 feet for horn noise at grade crossings.
- **OEA analyzed stream crossings to determine impacts on fish.** OEA used the number of streams that would be intersected by each Action Alternative to determine potential impacts on fish. The Action Alternatives that would cross more streams, have multiple crossings of a stream, or parallel a stream would have a greater potential to affect more fish and fish habitat than the Action Alternatives with fewer stream crossings and fewer streams adjacent to the rail corridor.

3.4.2 Affected Environment

This subsection identifies the existing environmental conditions related to biological resources in the study areas. 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.

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

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 in or near the study areas are US 191 and 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.

3.4.2.1 Wildlife

Common Wildlife

Large mammals found in the study areas include mule deer (*Odocoileus hemionus*), elk (*Cervus canadensis*), moose (*Alces alces*), pronghorn antelopes (*Antilocapra americana*), bighorn sheep (*Ovis canadensis*), coyotes (*Canis latrans*), cougars (*Felis concolor*), bobcats (*Lynx rufus*), and black bears (*Ursus americanus*) (Coalition 2020a; Wiken et al. 2011). Smaller animals include raccoons (*Procyon lotor*), skunks (*Mephitis mephitis*), red foxes (*Vulpes vulpes*), badgers (*Taxidea taxus*), white-tailed prairie dogs (*Cynomys leucurus*), porcupines (*Erethizon dorsatum*), beavers (*Castor canadensis*), rabbits (*Sylvilagus nuttallii*; *Lepus townsendii*; *Lepus californicus*; *Lepus americanus*; *Sylvilagus audubonii*), red squirrels (*Tamiasciurus hudsonicus*), and several species of snakes, lizards, bats, and mice (Coalition 2020a; Wiken et al. 2011). Birds are abundant throughout the study areas, and 57 bird species were identified in the study areas during field surveys (Coalition 2020a: Table 6-1).

Big Game

The study areas cross a number of areas identified as big game range (UDWR 2019b). UDWR, which manages big game populations~~species~~ in ~~Utah~~ distinct management units throughout Utah, characterizes big game habitat in terms of its seasonal use (year-long, winter, spring, or summer) and habitat value.[6] Crucial-value habitat is defined as habitat on which the local population of a wildlife species depends for survival because there are no alternate ranges or habitats available. Substantial-value habitat is defined as habitat that is used by a wildlife species but is not considered crucial for population survival. Bighorn sheep, elk, mule deer, and pronghorn antelope all have crucial year-long habitat in the study areas, and moose have crucial winter habitat in the study areas. Table 3.4-1 identifies the big game habitat in the study areas by Action Alternative, along with seasonal use of the habitat by species. Appendix G, *Biological Resources Figures,* contains figures displaying the relevant habitat for each species.

[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.

[6] Management units serve as the basis for big game population management recommendations.

Table 3.4-1. Seasonal Use of Existing Big Game Habitat in the Study Areas

Species	Action Alternative		
	Indian Canyon	**Wells Draw**	**Whitmore Park**
Bighorn sheep (*Ovis canadensis*)	• Year-long, crucial	• Year-long, crucial • Year-long, substantial	• Year-long, crucial
Elk (*Cervus canadensis*)	• Summer, crucial • Winter, crucial • Winter, substantial • Year-long, substantial	• Summer, crucial • Winter, crucial • Winter, substantial • Year-long, crucial • Year-long, substantial	• Summer, crucial • Winter, crucial • Winter, substantial • Year-long, substantial
Moose (*Alces alces*)	• Winter, crucial • Winter, substantial • Year-long, crucial	• Winter, crucial • Winter, substantial • Year-long, crucial	• Winter, crucial • Winter, substantial • Year-long, crucial
Mule deer (*Odocoileus hemionus*)	• Summer, crucial • Winter, crucial • Winter, substantial • Year-long, substantial	• Summer, crucial • Winter, crucial • Winter, substantial • Year-long, substantial	• Summer, crucial • Winter, crucial • Winter, substantial • Year-long, crucial • Year-long, substantial
Pronghorn antelope (*Antilocapra americana*)	• Year-long, crucial • Year-long, substantial	• Year-long, crucial • Year-long, substantial	• Year-long, crucial • Year-long, substantial

Notes:
Source: Coalition 2020a

Table 3.4-2 identifies the UDWR big game management units that are crossed by the Action Alternatives; the big game population within these management units are primarily managed to ensure healthy animals for a broad range of recreational opportunities (e.g., hunting and viewing) and to sustain healthy populations at a level that is within the long-term carrying capacity of the available habitat. Table 3.4.3 identifies big game movement corridors that UDWR mapped for OEA around the Action Alternatives. UDWR mapped movement corridors for big horn sheep, pronghorn, elk, and mule deer and identified each movement corridor as low, medium, or high importance. No moose movement corridors were identified along any Action Alternative. Bighorn sheep movement corridors are limited to a small area along the Indian Canyon Alternative and Whitmore Park Alternative in Indian Canyon. Pronghorn movement corridors are found in the Basin. Elk movement corridors are found in Emma Park area and upper Argyle Canyon/Bad Land Cliffs, as well as along the Wells Draw Alternative as it turns north of Bad Land Cliffs. Mule deer movement corridors are found in the Emma Park area, around Indian Canyon and Argyle Canyon. Appendix G, *Biological Resources Figures,* contains figures displaying the movement corridors for each big game species along the Action Alternatives.

Table 3.4-2. UDWR Big Game Management Units Crossed by the Action Alternatives

Species	UDWR Management Unit
Bighorn sheep (*Ovis canadensis*)	Nine Mile Unit 11, Wasatch Mountains Unit 17
Elk (*Cervus canadensis*)	Central Mountains Unit 16, Nine Mile Unit 11, South Slope Unit 9, Wasatch Mountains Unit 17
Moose (*Alces alces*)	Nine Mile Unit 11, Wasatch Mountains Unit 17
Mule deer (*Odocoileus hemionus*)	Central Mountains Unit 16, Nine Mile Unit 11, South Slope Unit 9, Wasatch Mountains Unit 17
Pronghorn antelope (*Antilocapra americana*)	Central Mountains Unit 16, Nine Mile Unit 11

Notes:
Sources: UDWR 2015, 2017a, 2017b, 2018, 2019d, 2021a

Table 3.4-3. Big Game Movement Corridors along the Action Alternatives

	Movement Corridors Identified by Importance		
Species	Indian Canyon	Wells Draw	Whitmore Park
Bighorn sheep (*Ovis canadensis*)	High	N/A	High
Elk (*Cervus canadensis*)	High, Medium, Low	High, Medium, Low	High, Medium, Low
Mule deer (*Odocoileus hemionus*)	Medium	Medium	Medium
Pronghorn antelope (*Antilocapra americana*)	High, Medium	High	High, Medium

Notes:
Source: UDWR 2021b
N/A = no movement corridors present; Low = the movement corridor is used by a limited number of individuals in the population each year; Medium = the movement corridor is used by a moderate number of individuals in the population each year; High = the movement corridor is used by a significant number of individuals in the population and/or corridor provides a critical connection between seasonal habitats for the population.

OEA notes that the Ute Indian Tribe has jurisdiction over wildlife and habitat within the Uintah and Ouray Reservation, including hunting, pursuant to the Law and Order Code of the Ute Indian Tribe of the Uintah and Ouray Reservation, Title VIII – Ute Indian Wildlife and Outdoor Recreation Code (Appendix B, *Regulations*).

Birds of Conservation Concern

USFWS maintains a Birds of Conservation Concern (BCC) list (USFWS 2015) that identifies species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the ESA. Table 3.4-~~2~~4 lists BCC that could occur in or near the study areas. OEA identified potentially suitable habitat in the study areas for 12 of the 14 BCC species.

Table 3.4-24. Migratory Birds of Conservation Concern Potentially in or near the Study Areas

Species Name	Is Species Listed as Potentially Present in the Study Areas by USFWS?[a]			Is Potentially Suitable Habitat Present in the Study Areas?[b]
	Indian Canyon Alternative	Wells Draw Alternative	Whitmore Park Alternative	
Black rosy-finch (*Leucosticte atrata*)	Yes	Yes	Yes	Potentially suitable habitat exists in the study areas for all three Action Alternatives.
Brewer's sparrow (*Spizella breweri*)	Yes	Yes	Yes	Potentially suitable habitat exists in the study areas for all three Action Alternatives.
Burrowing owl (*Athene cunicularia*)	Yes	No	Yes	Potentially suitable habitat exists in the study areas for the Indian Canyon Alternative and Whitmore Park Alternative.
Clark's grebe (*Aechmophorus clarkii*)	No	Yes	No	There is no suitable habitat in the study areas.
Golden eagle (*Aquila chrysaetos*)	Yes	Yes	Yes	Potentially suitable habitat exists in the study areas for all three Action Alternatives.
Grace's warbler (*Dendroica graciae*)	Yes	Yes	Yes	Potentially suitable habitat exists in the study areas for all three Action Alternatives.
Lesser yellowlegs (*Tringa flavipes*)	Yes	Yes	Yes	Potentially suitable habitat exists in the study areas for all three Action Alternatives.
Long-billed curlew (*Numenius americanus*)	Yes	Yes	Yes	Potentially suitable habitat exists in the study areas for all three Action Alternatives.
Marbled godwit (*Limosa fedoa*)	No	No	No	There is no suitable habitat in the study areas.
Olive-sided flycatcher (*Contopus cooperi*)	Yes	Yes	Yes	Potentially suitable habitat exists in the study areas for all three Action Alternatives.
Pinyon jay (*Gymnorhinus cyanocephalus*)	Yes	No	Yes	Potentially suitable habitat exists in the study areas for all three Action Alternatives.
Virginia's warbler (*Leiothlypis virginiae*)	Yes	Yes	Yes	Potentially suitable habitat exists in the study areas for all three Action Alternatives.
Willet (*Tringa semipalmata*)	Yes	Yes	Yes	Potentially suitable habitat exists in the study areas for all three Action Alternatives.

Species Name	Is Species Listed as Potentially Present in the Study Areas by USFWS?[a]			Is Potentially Suitable Habitat Present in the Study Areas?[b]
	Indian Canyon Alternative	Wells Draw Alternative	Whitmore Park Alternative	
Willow flycatcher (*Empidonax traillii*)	Yes	Yes	Yes	Potentially suitable habitat exists in the study areas for all three Action Alternatives.

Notes:

[a] Known or potential species presence as provided by USFWS 2020a, 2020b, 2020c.

[b] Information based on the Coalition's field surveys (Coalition 2020a) and Cornell Lab of Ornithology (Undated), NatureServe (Undated), and UDWR (2019a).

USFWS = United States Fish and Wildlife Service

3.4.2.2 Fish

The Action Alternatives are located in the Price River, Duchesne River, Strawberry River, and Lower Green-Desolation Canyon HUC 8 watersheds, which are all part of the Upper Colorado River Basin (Section 3.3, *Water Resources*, Figure 3.3-1). Major streams in these watersheds include Nine Mile Creek, Duchesne River, Strawberry River, and Price River; these all flow to the Green River, which is a major tributary to the Colorado River. Section 3.3, *Water Resources,* provides additional information on watersheds and surface waters that intersect the proposed rail line.

Perennial, intermittent, and ephemeral streams, as well as ponds, ditches, and canals in the study areas provide or support downstream habitat for fish. Although ephemeral streams may only temporarily support fish or may not support fish at all, they can indirectly support fish populations by helping to delivering required nutrients and other materials to perennial segments (USEPA 2008). Fish species in Utah are managed primarily by UDWR in cooperation with BLM, Forest Service, and USFWS. The Ute Indian Tribe Fish and Wildlife Department manages fish species native to the Uintah and Ouray Indian Reservation in cooperation with USFWS (Ute Indian Tribe 2015). Fish species in the study areas can be categorized as native nongame, native game, nonnative game, and nonnative nongame species. Table 3.4-~~3~~5 lists species known to occur in the study areas watersheds, organized by these categories. Table 3.4-~~3~~5 also includes an assessment of fish species that have been recorded in perennial waterbodies crossed by the proposed rail line.

Table 3.4-~~3~~5. Fish Species Known to Occur in the Study Area Watersheds and Documented in Perennial Streams Crossed by the Proposed Rail Line

Common Name[a]	Scientific Name
Native Nongame Fish	
Colorado pikeminnow[b]	*Ptychocheilus lucius*
Razorback sucker	*Xyrauchen texanus*
Bluehead sucker[b]	*Catostomus discobolus*
Bonytail	*Gila elegans*
Flannelmouth sucker[b]	*Catostomus latipinnis*
Longnose dace	*Rhinichthys cataractae*
Mottled sculpin[b]	*Cottus bairdii*
Mountain sucker [b]	*Catostomus platyrhynchus*
Roundtail chub[b]	*Gila robusta*
Speckled dace[b]	*Rhnichthys osculus*
Native Gamefish	
Mountain whitefish	*Prosopium williamsoni*
Colorado River cutthroat trout[b, c]	*Oncorhynchus clarki*
Nonnative Gamefish	
Bear Lake (Bonneville) cutthroat trout	*Oncorhynchus clarki utah*
Black bullhead[b]	*Ameiurus melas*
Black crappie	*Pomoxis nigromaculatus*
Bluegill	*Lepomis macrochirus*
Brown trout[b]	*Salmo trutta*
Rainbow trout[b]	*Oncorhynchus mykiss*

Common Name[a]	Scientific Name
Brook trout	*Salvelinus fontinalis*
Kokanee salmon	*Oncorhynchus nerka*
Largemouth bass	*Micropterus salmonides*
Smallmouth bass	*Micropterus dolomieu*
Channel catfish[b]	*Ictalurus punctatus*
Green sunfish[b]	*Lepomis cyanellus*
Walleye	*Sander vitreus*
Yellowstone cutthroat trout	*Oncorhynchus clarki bouvieri*
Nonnative Nongame Fish	
Brook stickleback	*Culea inconstans*
Fathead minnow[b]	*Pimephales promelas*
Grass carp	*Ctenopharyngodon idella*
Red shiner[b]	*Cyprinella lutrensis*
Redside shiner	*Richardsonius balteatus*
Sand shiner[b]	*Notropis stramineus*
Utah chub[b]	*Gila atraria*
White sucker	*Catostomus commersonii*
Common carp[b]	*Cyprinus carpio*

Notes:

[a] The fish species listed in this table represent species known to occur in the study area watersheds. This species list is based on multiple sources of publicly available information, including the sources listed below.

[b] These species have been documented in perennial waterbodies crossed by the action alternatives. Additional fish species represented by various suckers, minnows, darters, and sculpins could occur in all aquatic habitat types (e.g., perennial, intermittent, and ephemeral streams) present in the study areas.

[c] Colorado River cutthroat trout is a sensitive species that is managed under a conservation agreement between several federal agencies (e.g., BLM), three states (Utah, Colorado, and Wyoming), and the Ute Indian Tribe (Colorado River Cutthroat Trout Conservation Team 2006).

Sources: UDEQ 2015a, 2015b, 2017; UDWR 2010; URS 2003; USFWS 2003; Forest Service 1997; Brunson pers. comm.

Review of available reports and plans for the study areas indicate that 18 fish species are present in perennial waterbodies crossed by the Action Alternatives (Table 3.4-~~3~~35). There are 17 other fish species that are known to occur in the study area watersheds, but have not been documented in perennial waterbodies crossed by the Action Alternatives (Table 3.4-~~3~~35). Based on available data for fish species occurrence, the fish species potentially present are the same for all Action Alternatives (UDWR 2010). Across the three Action Alternatives, the study areas for the Whitmore Park Alternative contain the most perennial stream habitat, with 197,321 linear feet, followed by the study areas for the Indian Canyon Alternative with 189,699 linear feet of perennial streams and the study areas for the Wells Draw Alternative with 58,089 linear feet of perennial streams.

Indian Canyon Creek is the longest perennial stream found in the study areas of any of the Action Alternatives. The stream is adjacent to and parallels the Indian Canyon Alternative and Whitmore Park Alternative for approximately 25 miles. Fish surveys in multiple locations of Indian Canyon Creek were completed by UDWR in 2016; however, no fish were collected during the surveys (Brunson pers. comm.). UDWR has since stocked Colorado River cutthroat trout in Indian Canyon Creek ~~by UDWR~~, and the species were observed in Indian Canyon Creek by Forest Service biologists in fall of 2019 (Brunson pers. comm.). The Forest Service (1997) also noted that mottled sculpins

were reintroduced to Indian Canyon Creek in 1994. Additional fish species, including various suckers, minnows, darters, and sculpins not listed in Table 3.4-~~3~~5 could occur in all aquatic habitat types present in the study areas.

Game fish species are an important focus in UDWR's management of wildlife resources due to the species' recreational value. Game fish species in the study areas primarily consist of cold water (trout) and warm water species (sunfish and catfish). The majority of perennial streams in the study areas (e.g., Price River, Indian Canyon Creek, Nine Mile Creek and the western portion of the Duchesne River) are managed for cold water fishery beneficial use (Use Class 3A) (UDWQ 2016). Perennial streams generally in the eastern portion of the study areas and at lower elevations are primarily managed for warm water fishery beneficial use (Use Class 3B), such as in the eastern portions of the Duchesne River and Pariette Draw Creek (UDWQ 2016). Twelve game fish species are known to occur within the study area watersheds (Table 3.4-~~3~~5). None of the Action Alternatives cross UDWR-designated Blue Ribbon Fisheries, which are waters that have exceptional fishing quality, quality fish habitat, economic benefits, and contribute to a great outdoor experience (UDWR undated).

Management Indicators are defined by the Forest Service as: "[p]lant and animal species, communities, or special habitats selected for emphasis in planning, and which are monitored during forest plan implementation in order to assess the effects of management activities on their populations and the populations of other species with similar habitat needs which they may represent" (Forest Service 1991). The *Ashley National Forest Land Management Plan* (Forest Service 1986) identifies one fish, cutthroat trout, as a Management Indicator Species for Ashley National Forest.

3.4.2.3 Vegetation

Vegetation Communities

Vegetation communities in the study areas can be categorized into six broad land cover types based on USGS GAP data (USGS 2004): agriculture/altered, badland/bedrock, forest/woodland, meadow/grassland, open water, and shrubland. Table 3.4-~~4~~6 shows the acres of these vegetation communities in the study areas by Action Alternative. A total of 261 plant species were recorded during field surveys (Coalition 2020a: Appendix E). Detailed descriptions of the six land cover types and the corresponding GAP vegetation communities in the study areas are described in more detail in the Coalition's *Biological Resources Baseline Environment Technical Memorandum: Uinta Basin Railway* (Coalition 2020a: 9–27).

Table 3.4-~~4~~6. Vegetation Communities in the Study Areas by Land Cover Type (acres)

	Action Alternative		
Vegetation Communities by Land Cover Type	**Indian Canyon**	**Wells Draw**	**Whitmore Park**
Agriculture/Altered Land Cover Type			
Agriculture	561.4	197.0	561.4
Developed, Medium – High Intensity	9.6	0.0	9.5
Developed, Open Space – Low Intensity	0.0	2.8	0.2
Disturbed, Oil Well	0.0	53.7	0.0

Vegetation Communities by Land Cover Type	Action Alternative		
	Indian Canyon	Wells Draw	Whitmore Park
Recently Chained Pinyon-Juniper Areas	0.0	10.5	0.0
Total	**571.0**	**264.0**	**569.9**
Badland/Bedrock Land Cover Type			
Colorado Plateau Mixed Bedrock Canyon and Tableland	216.2	464.6	217.7
Inter-Mountain Basins Shale Badland	387.1	134.4	386.8
Rocky Mountain Cliff and Canyon	158.6	591.5	149.7
Total	**761.9**	**1,190.5**	**754.2**
Forest/Woodland Land Cover Type			
Colorado Plateau Pinyon-Juniper Woodland	954.3	3,306.2	1,003.8
Inter-Mountain West Aspen-Mixed Conifer Forest and Woodland Complex	3.8	11.0	3.0
Invasive Southwest Riparian Woodland and Shrubland	0.0	3.3	0.0
Rocky Mountain Aspen Forest and Woodland	198.7	170.1	74.4
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	141.6	37.5	142.9
Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland	193.5	186.9	161.7
Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland	95.1	74.2	70.2
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	1.8	2.5	1.8
Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland	7.3	51.4	7.3
Total	**1,596.1**	**3,843.1**	**1,465.1**
Meadow/Grassland Land Cover Type			
Inter-Mountain Basins Semi-Desert Grassland	84.5	191.7	85.6
Invasive Annual Grassland	18.4	26.7	18.3
Rocky Mountain Alpine-Montane Wet Meadow	211.8	74.0	161.0
Southern Rocky Mountain Montane-Subalpine Grassland	111.4	197.9	155.1
Total	**426.1**	**490.3**	**420.0**
Open Water Land Cover Type			
Open Water	10.6	9.2	10.6
Total	**10.6**	**9.2**	**10.6**
Shrubland Land Cover Type			
Colorado Plateau Mixed Low Sagebrush Shrubland	1,047.6	1,095.6	1,099.4
Colorado Plateau Pinyon-Juniper Shrubland	542.8	229.2	651.4
Inter-Mountain Basins Big Sagebrush Shrubland	968.0	1,175.6	1,091.4
Inter-Mountain Basins Greasewood Flat	385.4	315.5	364.8

Vegetation Communities by Land Cover Type	Action Alternative		
	Indian Canyon	Wells Draw	Whitmore Park
Inter-Mountain Basins Mat Saltbush Shrubland	65.9	55.1	65.8
Inter-Mountain Basins Mixed Salt Desert Scrub	1,272.1	1,720.7	1,275.1
Inter-Mountain Basins Montane Sagebrush Steppe	1,392.3	1,954.7	1,871.3
Inter-Mountain Basins Semi-Desert Shrub Steppe	276.1	254.4	269.3
Rocky Mountain Gambel Oak–Mixed Montane Shrubland	204.9	84.3	203.2
Total	**6,155.1**	**6,885.1**	**6,891.7**

Notes:
Sources: Coalition 2020a; USGS 2004

Riparian Vegetation

Riparian vegetation occurs along water courses in areas transitioning from aquatic to upland environments. These transitional areas provide important habitat for many plant and animal species. Descriptions of riparian communities in the GAP forest/woodland land cover type are found in the Coalition's *Biological Resources Baseline Environment Technical Memorandum: Uinta Basin Railway* (Coalition 2020a:15, 18). To identify the extent of riparian areas more accurately, the Coalition mapped riparian vegetation (including woody and herbaceous) in the study areas for each Action Alternative based on field surveys and interpretation of aerial images. Riparian areas total about 205.7 acres in the study areas for the Indian Canyon Alternative, about 135.6 acres in the study areas for the Wells Draw Alternative, and about 178.5 acres in the study areas for the Whitmore Park Alternative.

Wildfire Ecology

Wildfires, which affect vegetation, are a common occurrence in Utah because of a primarily arid climate (Utah Division of Emergency Management 2019). Wildfires are part of the normal vegetative cycle for some vegetation communities and are an integral part of healthy forest and grassland growth and regeneration. However, recent climatic trends of hotter and drier weather and earlier snowmelt are resulting in wildfires in the West that start earlier in the spring, last later into the fall, and burn more acreage (Melillo et al. 2014).

According to the Forest Service, each year more than 73,000 wildfires burn about 7 million acres of federal, tribal, state, and private land and more than 2,600 structures in the United States (Forest Service 2020cb). The state of Utah estimates there are 800 to 1,000 wildfires every summer in Utah (Utah Division of Emergency Management 2019). Long periods of drought increase the length of fire seasons and create dangerous conditions that allow a fire to spread rapidly. In 2017, wildfires consumed over 200,000 acres in Utah (Utah Division of Emergency Management 2019). In Utah, firefighters suppress 95 percent of wildfires on initial attack, but adverse weather and topography, heavy fuel loads, and urban development all combine to create catastrophic wildfire conditions in the state (Utah Division of Emergency Management 2019). Some of the largest fires in Utah have occurred since 2018, including the Dollar Ridge Fire (July 2018) that burned 68,869 acres in western Duchesne County, and the East Fork Fire (August–October 2020) that burned 89,463 acres in northern Duchesne County (National Wildfire Coordinating Group 2020; Utah Division of

Emergency Management 2019). ~~One of Utah's largest wildfires, t~~The Neola North Fire (2007)~~, occurred in Duchesne County and~~ burned about 43,800 acres in Duchesne County~~2007~~ (Utah Division of Emergency Management 2019).

Wildfires are caused by natural and human factors, including railroads. The Forest Service~~USGS~~ has compiled wildfire occurrence data collected by federal, state, and local fire organizations~~ land management agencies~~ from 19~~92~~80 through 201~~56~~ (~~USGS~~Forest Service 201~~7a~~9). The data include~~s~~ the approximate size of the wildfire and the cause of the wildfire, if known. ~~Of all the wildfires with a reported cause, a~~Over the 24 years of wildfire records, approximately 1.8~~0.5~~ percent of wildfires in the United States and 0.5~~2~~ percent of the wildfires in ~~the lower 48 states and~~ Utah~~, respectively,~~ were caused by railroads. Table 3.4-~~5~~7 presents the cause and number of wildfires and acres burned in Utah from 19~~92~~80 to 201~~56 (for data that included a cause)~~. Acres burned as a result of wildfires started by railroads represent 1.9~~0.06~~ percent of all acres burned in Utah over 24~~36~~ years of wildfire records (Table 3.4-~~5~~7).

Table 3.4-~~5~~7. Wildfires in Utah (19~~92~~80–201~~56~~)

~~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~~

Cause of Fire	**Number of Fires**	**Percent of Fires**	**Acres Burned**
Lightning	16,747	54.5	2,718,318
Missing/Unidentified	7,609	24.8	320,466
Miscellaneous	1,689	5.5	465,528
Campfire	1,515	4.9	117,062
Debris Burning	871	2.8	25,119
Equipment Use	855	2.8	121,634
Arson	467	1.5	178,232
Children	226	0.7	6,884
Smoking	225	0.7	7,424
Railroad	168	0.5	78,953
Fireworks	165	0.5	9,218
Powerline	148	0.5	65,923
Structure	40	0.1	165
Total	**30,725**	**100**	**4,114,926**

Notes:
Source: Forest Service 2017a

The Forest Service created a Wildfire Hazard Potential (WHP) map for the continental United States to help inform evaluations of wildfire risk or prioritization of fuel-management needs across very large landscapes (Forest Service 2020a~~18~~). The Forest Service's objective with the WHP map is to depict the relative potential for wildfire that would be difficult for suppression resources to contain. According to the Forest Service, the WHP map approximates relative wildfire risk to highly valued resources and assets (e.g., communities, structures, and powerlines).

The WHP map displays those areas within the continental United States that have different levels of fire potential, categorized by five WHP classes (very low, low, moderate, high, and very high) and two non-WHP classes (non-burnable and water). Appendix G, *Biological Resources Figures,* Figure G-1, shows the fire potential within and near the study areas for the Action Alternatives.

Table 3.4-~~6~~8 shows the amount of the WHP classes in the study areas by Action Alternative. Of the total area assigned WHP class, approximately 90 percent of the study areas for the Indian Canyon Alternative and Whitmore Park Alternative and approximately 8~~7~~4 percent of the study area for the Wells Draw Alternative, are associated with very low, low, or moderate wildfire hazard potential. The very high WHP class is not present in the study areas for any Action Alternative.

Table 3.4-~~6~~8. Wildfire Hazard Potential in the Study Areas (acres)

Wildfire Hazard Potential Class	Action Alternative		
	Indian Canyon	Wells Draw	Whitmore Park
Very low	2,330.1~~002.4~~	2,620.2~~589.7~~	2,252.2~~106.2~~
Low	4,549.7~~678.4~~	5,482.6~~173.7~~	5,080.1~~106.4~~
Moderate	634.6~~761.7~~	1,611.8~~43.0~~	731.2~~987.0~~
High	880.5~~786.0~~	1,446.3~~617.7~~	990.4~~675.8~~
Very high	--	--	--
Nonburnable	1,126.1~~292.5~~	1,521.6~~658.2~~	1,077.8~~256.3~~
Water	--	--~~0.3~~	0.1~~--~~

Notes:
Source: Forest Service 2020a~~18~~

Table 3.4-9 shows the area of WHP class for rail line segments downline of the proposed rail line that could experience an increase in rail traffic above OEA's thresholds at 49 C.F.R. § 1105.7(e)(5) if the proposed rail line were constructed (see Appendix C, *Downline Analysis Study Area and Train Characteristics*). For consistency with the description of WHP in the study areas of the Action Alternatives, the areas shown in Table 3.4-9 include a 1,000-foot buffer (500 feet on either side of the centerline) for each downline segment. Overall, approximately 88 percent of the combined downline segments' study areas are associated with very low, low, nonburnable, and water WHP classes; high and very high WHP classes make up only 5 percent, while the moderate WHP class makes up only 7 percent.

Table 3.4-9. Wildfire Hazard Potential along Downline Segments (acres)

Wildfire Hazard Potential Class	Downline Segment				
	Kyune to Denver	Denver Eastbound	Denver Southbound	Denver Northbound	Denver East/North
Very low	19,965	24	292	1,306	2,912
Low	12,523	5	1,675	1,336	881
Moderate	4,440	--	1,133	14	15
High	2,825	--	322	--	--
Very high	958	--	15	--	--
Nonburnable	10,380	322	3,162	5,670	3,348
Water	4,330	19	12	37	--

Notes:
Source: Forest Service 2020a

Invasive and Noxious Weeds

Invasive weeds are weeds that establish, persist, and spread widely in natural ecosystems outside the plant's native range. These weeds often lack natural controls to curtail their growth, enabling them to overrun native plants and ecosystems. Many invasive weeds are also classified as noxious weeds by government authorities.

A noxious weed is any plant designated by federal, state, or local government officials as injurious to public health, agriculture, recreation, wildlife, or property. Once a weed is classified as noxious, authorities can implement quarantines and take other actions to contain or destroy the weed and limit its spread. Under the authority of the Utah Noxious Weed Act (Utah Code § 4-17-101 et seq.), the Utah Department of Agriculture and Food maintains a list of noxious weeds (Utah Department of Agriculture and Food 2019).

Invasive and noxious weeds can grow in upland, wetland, and aquatic environments (e.g., streams)~~Invasive and noxious weeds;~~ they are typically found in areas where the ground or soil has been disturbed and are commonly found along transportation corridors (e.g., roads, highways, rail lines); along utility corridors (e.g., transmission lines and pipelines); in residential, commercial, and industrial areas; around agricultural lands; and in other developed, disturbed, or human-influenced areas.

The following two land cover types present in the study areas include areas dominated by invasive or noxious species (Table 3.4-46).

- The Invasive Southwest Riparian Woodland and Shrubland vegetation community consists of areas dominated by introduced riparian woody species, such as salt cedars (*Tamarix* spp.) and Russian olive (*Elaeagnus angustifolia*), both of which are state-designated noxious weeds. Based on GAP vegetation data (Table 3.4-46), approximately 3.3 acres of this invasive vegetation community is in the study areas for the Wells Draw Alternative.
- The Invasive Annual Grassland vegetation community includes areas dominated by introduced annual grass species, such as *Avena* species, *Bromus* species, and *Schismus* species. Based on the vegetation data (Table 3.4-46), this invasive vegetation community is present in the study areas for all the Action Alternatives (approximately 18.4, 26.7, and 18.3 acres in the study areas for

the Indian Canyon Alternative, Wells Draw Alternative, and Whitmore Park Alternative, respectively).

In addition to using the GAP vegetation data to identify invasive and noxious species, OEA looked at the Forest Service's current invasive plants database (Forest Service 2020ba). This database contains the latest invasive plant infestation polygons collected by the National Invasive Plant Inventory Protocol. Based on this data, the study areas for the Indian Canyon Alternative and Whitmore Park Alternative contains populations of nodding plumeless thistle (*Carduus nutans*), which is a state-designated noxious weed. Another state-designated noxious weed, hardheads (*Acroptilon repens*), is located near the study areas for the Indian Canyon Alternative and Whitmore Park Alternative.

3.4.2.4 Special Status Species

Special status species are species that are afforded special protections under federal or state regulations. These include species that are listed or proposed to be listed as threatened or endangered under the ESA; candidate species for ESA listing; bald and golden eagles; and sensitive species listed by BLM, the Forest Service, and the state of Utah.

ESA-Listed Species

Four ESA-listed plant species are known to occur or could occur in or near the study areas (Table 3.4-710). The study areas do not contain designated or proposed critical habitat for any ESA-listed plant species. Field surveys identified suitable habitat for Barneby ridge-cress (*Lepidium barnebyanum*) in the field survey study area for the Indian Canyon Alternative and Whitmore Park Alternative. The field survey study areas of all three Action Alternatives contain suitable habitat for Pariette cactus (*Sclerocactus brevispinus*) and Uinta Basin hookless cactus (*Sclerocactus wetlandicus*). In addition, there is suitable habitat for Ute ladies'-tresses (*Spiranthes diluvialis*) in the study areas for all three Action Alternatives. Appendix G, *Biological Resources Figures,* Figures G-2a and G-2b, shows areas of known occurrence and suitable habitat for Barneby ridge-cress, Pariette cactus, and Uinta Basin hookless cactus.

Eight ESA-listed animal species could occur or are known to occur in or near the study areas (Table 3.4-811), including two bird species, five fish species, and one mammal species. OEA identified suitable habitat for two of these eight species in the study areas during field surveys. The study areas do not include designated or proposed critical habitat for any ESA-listed animal species.

Table 3.4-~~7~~10. ESA-Listed Plant Species Known to Occur or Potentially Occur in or near the Study Areas

Species Name	Status	Is Species Listed as Potentially Present in the Study Areas by USFWS?[a]			Is Potentially Suitable Habitat Present in the Study Areas?[b]
		Indian Canyon	Wells Draw	Whitmore Park	
Barneby ridge-cress (*Lepidium barnebyanum*)	E	Yes	No	Yes	The range of potentially suitable habitat is within the study areas for the Indian Canyon Alternative and Whitmore Park Alternative (Appendix G, *Biological Resources Figures,* Figure G-2a).[c] Field habitat surveys conducted in this area found two habitat types that would support the species, including Pinyon-juniper habitat and white shale habitat. The Indian Canyon Alternative includes 36.2 acres of white shale habitat and 252.4 acres pinyon-juniper habitat. The Whitmore Park Alternative includes 50.8 acres of white shale habitat and 3~~89.5~~38.7 acres of pinyon-juniper habitat (Coalition 2020b: Table 1 and Appendix A).
Pariette cactus (*Sclerocactus brevispinus*)	T	Yes	Yes	Yes	Suitable habitat exists in the study areas for all Action Alternatives (Appendix G, *Biological Resources Figures,* Figure G-2b~~2~~), including 1,087 acres in the study areas for the Indian Canyon Alternative and Whitmore Park Alternative and 1,254 acres in the study area for the Wells Draw Alternative.
Uinta Basin hookless cactus (*Sclerocactus wetlandicus*)	T	Yes	Yes	Yes	Suitable habitat exists in the study areas for all Action Alternatives (Appendix G, *Biological Resources Figures*, Figure G-2b~~2~~), including 1,087 acres in the Indian Canyon Alternative and Whitmore Park Alternative study areas, and 1,254 acres in the study area for the Wells Draw Alternative.
Ute ladies'-tresses (*Spiranthes diluvialis*)	T	Yes	Yes	Yes	Suitable habitat exists in the study areas along water courses and in wet meadows where vegetation is relatively open and below 7,000 feet. There are 11.4 acres of potential habitat in the study areas for the Indian Canyon Alternative, 1.0 acre for the Wells Draw Alternative, and 11.3 acres for the Whitmore Park Alternative (Coalition 2020c: Table 1 and Appendix B).

Notes:

[a] Known or potential species presence as provided by USFWS (2020a, 2020b, 2020c) and Utah Natural Heritage Program (2020a, 2020b, 2020c).

[b] Information is based on the Coalition's field surveys (Coalition 2020a, 2020b, 2020c)) and NatureServe (Undated), UDWR (2019a), and Utah Native Plant Society (2020).

[c] USFWS is evaluating the Barneby ridge-cress range/suitable habitat requirements, which could alter the amount of suitable habitat mapped in the study area. Pre-construction surveys (Appendix I, *Biological Assessment*) would consider the best available USFWS information on the species' range/habitat requirements.

USFWS = United States Fish and Wildlife Service; E = endangered; T = threatened

Table 3.4-~~8~~11. ESA-Listed Animal Species Known to Occur or Potentially Occur in or near the Study Areas

Species Name[a]	Status	Is Species Listed as Potentially Present in the Study Areas by USFWS?[a]			Is Potentially Suitable Habitat Present in the Study Areas?[b]
		Indian Canyon	Wells Draw	Whitmore Park	
Mammals					
Canada lynx (*Lynx canadensis*)	T	Yes	Yes	Yes	Potentially suitable habitat exists in the study areas for all three Action Alternatives. Year-long crucial[c] habitat for snowshoe hare (primary food of the Canada lynx) is present at higher elevations and can indicate potential suitable habitat (Appendix G, *Biological Resources Figures,* Figure G-4). However, potentially suitable habitat in the study areas (which mostly coincides with the higher elevations of Ashley National Forest) is marginal, and there are no historic lynx locations anywhere in or around the study areas. In addition, Ashley National Forest is not considered to contain lynx habitat sufficient to support a breeding female lynx. 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.
Birds					
Mexican spotted owl (*Strix occidentalis lucida*)	T	Yes	Yes	Yes	USFWS habitat models identify potentially suitable habitat in the study areas (Appendix I, *Biological Assessment*, Figure 4-2~~Appendix G, *Biological Resources Figures,* Figure G-3~~). However, detailed field habitat surveys for Mexican spotted owl found very little suitable habitat in the study areas that could be used by the species (Appendix G, *Biological Resources Figures,* Figure G-3). The survey found that nearly all of the habitat along the Action Alternatives, including all of the habitat within Ashley National Forest, would be defined as low quality, meaning that most of the required nesting and foraging characteristics are absent; therefore, these areas are unlikely to support or be used by the species. A few small, isolated areas along the Wells Draw Alternative on BLM land were determined to be moderate quality habitat (Coalition 2020d: Table 2 and Figure 3). While nesting and foraging habitat characteristics are present in these areas and would support use by the species, these moderate quality habitat areas lack connectivity, which likely reduces the probability of occupancy. Habitat defined as high quality was not found along any Action Alternative.

Species Name[a]	Status	Is Species Listed as Potentially Present in the Study Areas by USFWS?[a]			Is Potentially Suitable Habitat Present in the Study Areas?[b]
		Indian Canyon	Wells Draw	Whitmore Park	
Yellow-billed cuckoo (*Coccyzus americanus*)	T	Yes	Yes	Yes	There is no suitable habitat large enough in or within 0.5 mile of the study areas for the three Action Alternatives, including within Ashley National Forest or on other public lands.
Fish					
Bonytail (*Gila elegans*)	E	Yes	Yes	Yes	There is no suitable habitat in the study areas for any of the Action Alternatives. Suitable habitat is available downstream of the rail line corridor for each Action Alternative. Indian Canyon Creek is located in the study areas for the Indian Canyon Alternative and Whitmore Park Alternative, Argyle Creek is located in the study areas for the Wells Draw Alternative, and Willow Creek and the Price River are located in the study areas for all Action Alternatives. All of these waterways ultimately drain to the Green River system, which provides suitable habitat for this fish species.
Colorado pikeminnow (*Ptychocheilus lucius*)	E	Yes	Yes	Yes	There is no suitable habitat in the study areas for any of the Action Alternatives. Suitable habitat is available downstream of the rail line corridor for each Action Alternative. Indian Canyon Creek is located in the study areas for the Indian Canyon Alternative and Whitmore Park Alternative, Argyle Creek is located in the study areas for the Wells Draw Alternative, and Willow Creek and the Price River are located in the study areas for all three Action Alternatives. All of these waterways ultimately drain to the Green River system, which provides suitable habitat for this fish species.
Humpback chub (*Gila cypha*)	E	Yes	Yes	Yes	There is no suitable habitat in the study areas for any of the Action Alternatives. Suitable habitat is available downstream of the rail line corridor for each Action Alternative. Indian Canyon Creek is located in the study areas for the Indian Canyon Alternative and Whitmore Park Alternative, Argyle Creek is located in the study areas for the Wells Draw Alternative, and Willow Creek and the Price River are located in the study areas for all three Action Alternatives. All of these waterways ultimately drain to the Green River system, which provides suitable habitat for this fish species.
June sucker (*Chasmistes liorus*)	E	Yes	Yes	Yes	There is no suitable habitat in the study areas for any of the Action Alternatives, nor is there downstream habitat.

Species Name[a]	Status	Is Species Listed as Potentially Present in the Study Areas by USFWS?[a]			Is Potentially Suitable Habitat Present in the Study Areas?[b]
		Indian Canyon	Wells Draw	Whitmore Park	
Razorback sucker (*Xyrauchen texanus*)	E	Yes	Yes	Yes	There is no suitable habitat in the study areas for any of the Action Alternatives. Suitable habitat is available downstream of the rail line corridor for each Action Alternative. Indian Canyon Creek is located in the study areas for the Indian Canyon Alternative and Whitmore Park Alternative and eventually drains in the Duchesne River, which is a tributary of the Green River (suitable habitat for this fish species). Argyle Creek is located in the study areas for the Wells Draw Alternative and Willow Creek and the Price River are located in the study areas for all Action Alternatives. All of these waterways ultimately drain to the Green River system, which provides suitable habitat for this fish species.

Notes:

[a] Known or potential species presence as provided by USFWS (2017, 2020a, 2020b, 2020c) and UNHP (2020a, 2020b, 2020c).

[b] Information based on the Coalition's field surveys (Coalition 2020a, Coalition 2020d), NatureServe (Undated), UDWR (2019a), and Christensen and Groves pers. comm.

[c] Crucial habitat is habitat on which the local population of a wildlife species depends for survival because there are no alternative ranges or habitats available. Crucial habitat is essential to the life history requirements of a wildlife species. Degradation or unavailability of crucial habitat will lead to significant declines in carrying capacity and/or numbers of wildlife species in question.

USFWS = United States Fish and Wildlife Service; E = endangered; T = threatened

Bald and Golden Eagles

Potentially suitable habitat for bald and golden eagles exists in the study areas. During the field surveys, both eagle species were recorded in the study areas for all three Action Alternatives, as well as within a 2-mile radius of the study areas (Coalition 2020a).

Sensitive Species

BLM and the Forest Service provided a list of 24 sensitive plant species that are known to occur or suspected to occur in Carbon, Duchesne, Uintah, or Utah Counties. Based on field surveys, potentially suitable habitat might exist for 15 of the 24 species in the study areas (Coalition 2020a: Table 5-3). OEA further consulted Forest Service biologists on Forest Service-designated sensitive plants for the development of and support for the Forest Service's Biological Evaluation. The Biological Evaluation, included as Appendix H, *Biological Evaluation*, to this ~~Draft~~ EIS, is a standalone Forest Service document that is required for addressing the proposed rail line's potential impact on Forest Service-designated sensitive species. OEA's screening process and consultation with Forest Service biologists resulted in identification of two sensitive plant species that could occur along the Indian Canyon Alternative and Whitmore Park Alternative (the Wells Draw Alternative would not cross Forest Service lands). These species are Goodrich blazingstar (*Mentzelia goodrichii*) and low greenthread (*Thelesperma caespitosum*). However, the proposed rail line would be located outside the elevation where these species occur or potentially occur and were dismissed from further analysis in the Biological Evaluation.

Plants of tribal importance to the Ute Indian Tribe include 31 tree, shrub, and herbaceous species or genus of species that are used for medicinal, ceremonial, utilitarian, and food purposes (Forest Service 2017b). During field surveys, 23 plant species of tribal importance were observed in the study areas, including aspens, sagebrushes, dandelions, chokecherry, gooseberries, willows, elderberry, pine, mahoganies, onion, mint, yarrow, and yucca.

OEA consulted the Utah Conservation Data Center (UDWR 2019a), as well as representatives of Ashley National Forest and BLM to determine the state-listed, Forest Service-listed, and BLM-listed sensitive animal species that might occur in the study areas. Forty-five sensitive wildlife species were identified, including 2 amphibians, 15 birds, 11 fish, 11 mammals, 4 mollusks, and 2 reptiles. Based on field surveys, potentially suitable habitat was identified in the study areas for 26 of the 45 species (Coalition 2020a: Table 6-4). OEA further consulted Forest Service biologists and also reviewed Forest Service survey data on Forest Service-designated sensitive wildlife for the Biological Evaluation (Appendix H, *Biological Evaluation*). OEA's screening process and consultation with Forest Service biologists resulted in identification of four sensitive wildlife species—flammulated owl (*Psiloscops flammeolus*), three-toed woodpecker (*Picoides dorsalis*), northern goshawk (*Accipiter gentilis*), bighorn sheep (*Ovis canadensis*) —that could occur along and potentially be adversely affected by the Indian Canyon Alternative and Whitmore Park Alternative (the Wells Draw Alternative would not cross Forest Service lands). However, as described in the Biological Evaluation (Appendix H, *Biological Evaluation*), the proposed rail line would have little or no likelihood of adversely affecting these species. The Biological Evaluation (Appendix H, *Biological Evaluation*) provides more detail on this assessment and conclusion.

3.4.2.5 Greater Sage-Grouse

The greater sage-grouse is a sensitive bird species of particular concern in the study areas. All three Action Alternatives would cross areas containing mapped greater sage-grouse habitat in the Emma Park area between the connection with the existing UP rail line near Kyune, Utah, (milepost 0) and the portal of the proposed summit tunnel (approximately milepost 18). The Action Alternatives would pass through or near known leks~~, which are areas where greater sage-grouse congregate during the spring breeding season~~. These are usually located in sparsely vegetated areas where the males' courtship display can be easily seen by females.

USFWS found in March 2010 that greater sage-grouse warranted listing under the ESA. That finding was attributed to habitat fragmentation and "inadequate regulatory mechanisms" designed to protect habitat at the local, state, and federal levels. In response, BLM amended its land use plans to incorporate specific conservation measures across the geographic range of the greater sage-grouse (discussed further below). Also, Utah Governor Gary Herbert established a task force to review relevant information and develop a statewide plan to conserve sage-grouse and their habitat. The state of Utah finalized its first Conservation Plan for Greater Sage-Grouse in February 2013. The conservation plan identified Utah's Sage-Grouse Management Areas (SGMAs), which represent the highest-priority areas for sage-grouse conservation.

In October 2015, USFWS found that greater sage-grouse did not warrant listing under the ESA. That decision was based on new scientific information and voluntary conservation measures put in place since 2010, including state-led conservation actions. Utah has continued its sage-grouse management practices and revised its conservation plan to incorporate practices identified by USFWS in 2015 (State of Utah~~UDWR~~ 2019~~e~~).

UDWR Carbon Greater Sage-grouse Management Area

The Carbon SGMA is located in the area of Emma Park, near the southern end of the three Action Alternatives. The Coalition obtained information regarding greater sage-grouse habitat and lek locations from UDWR range maps and metadata (UDWR 2019b). Figure 3.4-1 shows the Carbon SGMA in relation to the three Action Alternatives. The figure shows habitat, nonhabitat, and opportunity areas.

- **Habitat areas.** Habitat areas include the "combined total of seasonal habitats used by greater sage-grouse at some point during their lifecycle. Habitat includes the geographical extent of leks, nesting, brood-rearing, transitional, and winter areas" (State of Utah~~UDWR~~ 2019~~e~~).
- **Nonhabitat areas.** Nonhabitat areas are land that does not contribute to the lifecycle of greater sage-grouse (State of Utah~~UDWR~~ 2019~~e~~).
- **Opportunity areas.** Opportunity areas are those portions of the SGMA that "currently do not contribute to the lifecycle of sage-grouse, but they are areas where restoration or rehabilitation efforts can provide additional habitat when linked to existing sage-grouse populations" (State of Utah~~UDWR~~ 2019~~e~~).

Table 3.4-~~9~~12 shows the acreage of habitat, nonhabitat, and opportunity areas in the study areas by Action Alternative. At least four known lek locations are near the southern end of the Indian Canyon Alternative and Wells Draw Alternative, and five are located near the Whitmore Park Alternative (Figure 3.4-1).

Figure 3.4-1. UDWR Greater Sage-Grouse Habitat

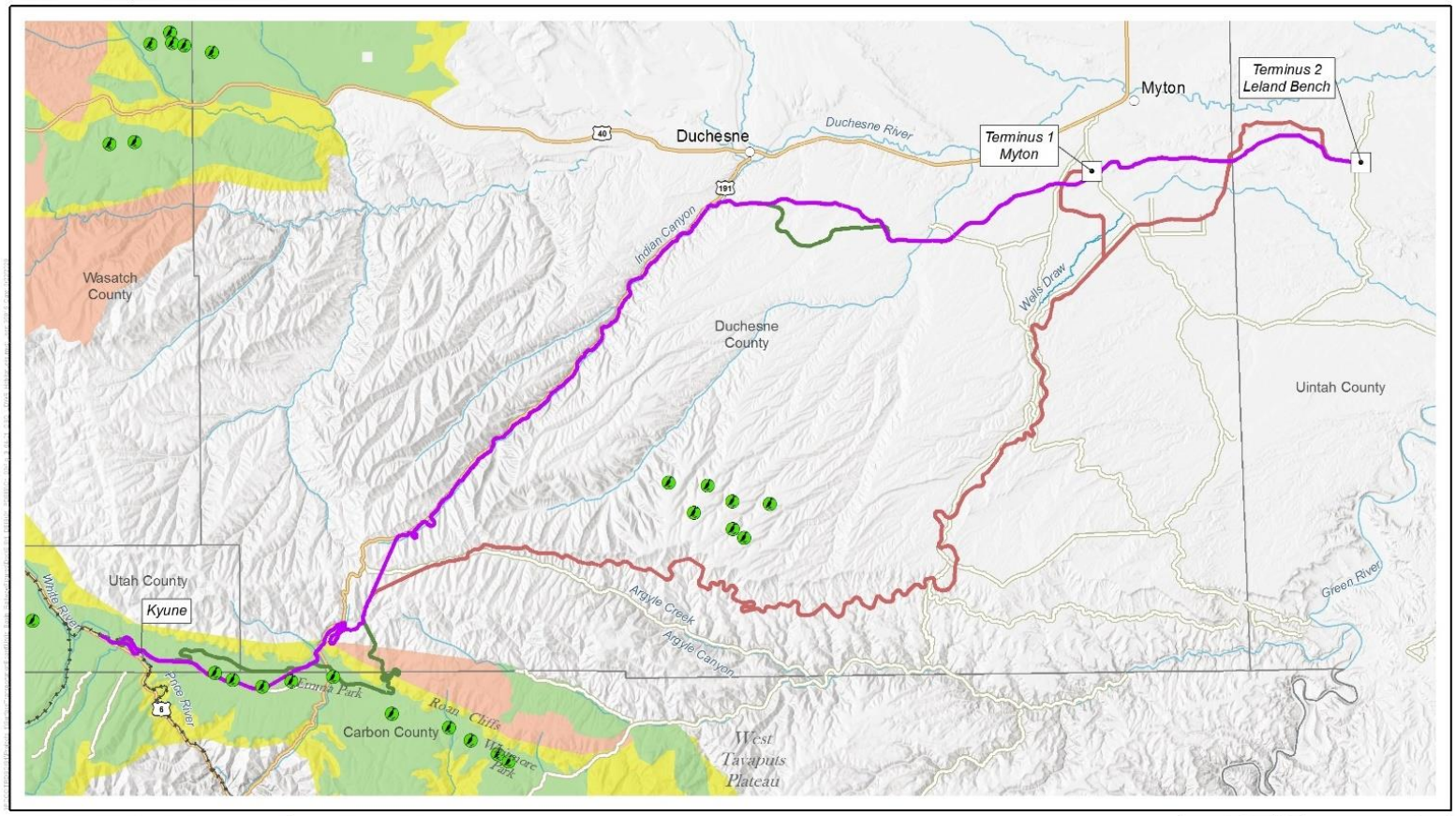

Table 3.4-~~9~~12. UDWR-defined Greater Sage-Grouse Habitat in the Study Areas (acres)

	Action Alternative		
Type of Area[a]	**Indian Canyon**	**Wells Draw**	**Whitmore Park**
Habitat	1,668.5	1,668.5	2,271.8
Nonhabitat	239.3	186.6	461.7
Opportunity	58.4	58.5	96.5
Total	**1,966.2**	**1,913.6**	**2,842.8**

Notes:
[a] Acreages are of greater sage-grouse habitat type in the field survey study areas for each Action Alternative. Table 3.4-22 shows the UDWR-defined greater sage-grouse habitat that would be permanently and temporarily disturbed within the project footprint for each Action Alternative.
Source: Coalition 2020a; UDWR 2019b

BLM Greater Sage-Grouse Management Area

BLM prepared the *Utah Greater Sage-Grouse Approved Resource Management Plan Amendment* (BLM 2015a) to amend the resource management plans for BLM field offices that manage land containing greater sage-grouse priority and general habitats. BLM prepared this plan amendment in response to USFWS's March 2010 ESA listing decision for greater sage-grouse in which USFWS identified the present or threatened destruction, modification, or curtailment of habitat or range for this species and the inadequacy of existing regulatory mechanisms as significant threats. BLM recognized that changes in management were necessary to avoid the continued decline of greater sage-grouse populations across the species' range. Figure 3.4-2 shows the BLM priority and general habitat areas in relation to the Action Alternatives. The figure shows priority and general habitat management areas and a separate occupied habitat category.

- **Priority habitat management areas (PHMAs).** Priority habitat management areas are "BLM-administered lands identified as having the highest value to maintaining sustainable greater sage-grouse populations. These areas include breeding, late brood-rearing, winter concentration areas, and migration or connectivity corridors" (BLM 2015a).
- **General habitat management areas.** General habitat management areas are "BLM-administered lands where some special management will apply to sustain greater sage-grouse populations. Areas of occupied seasonal or year-round habitat outside of priority" (BLM 2015a).
- **Occupied habitat.** Occupied habitat refers to lands where the surface and mineral estates are owned or administered by separate entities. In these areas, BLM administers the mineral rights, but not the surface estate (BLM 2015a).

Table 3.4-~~10~~13 shows the acreage of BLM priority and general habitat management areas in the study areas by Action Alternative.

Figure 3.4-2. BLM Greater Sage-Grouse Habitat

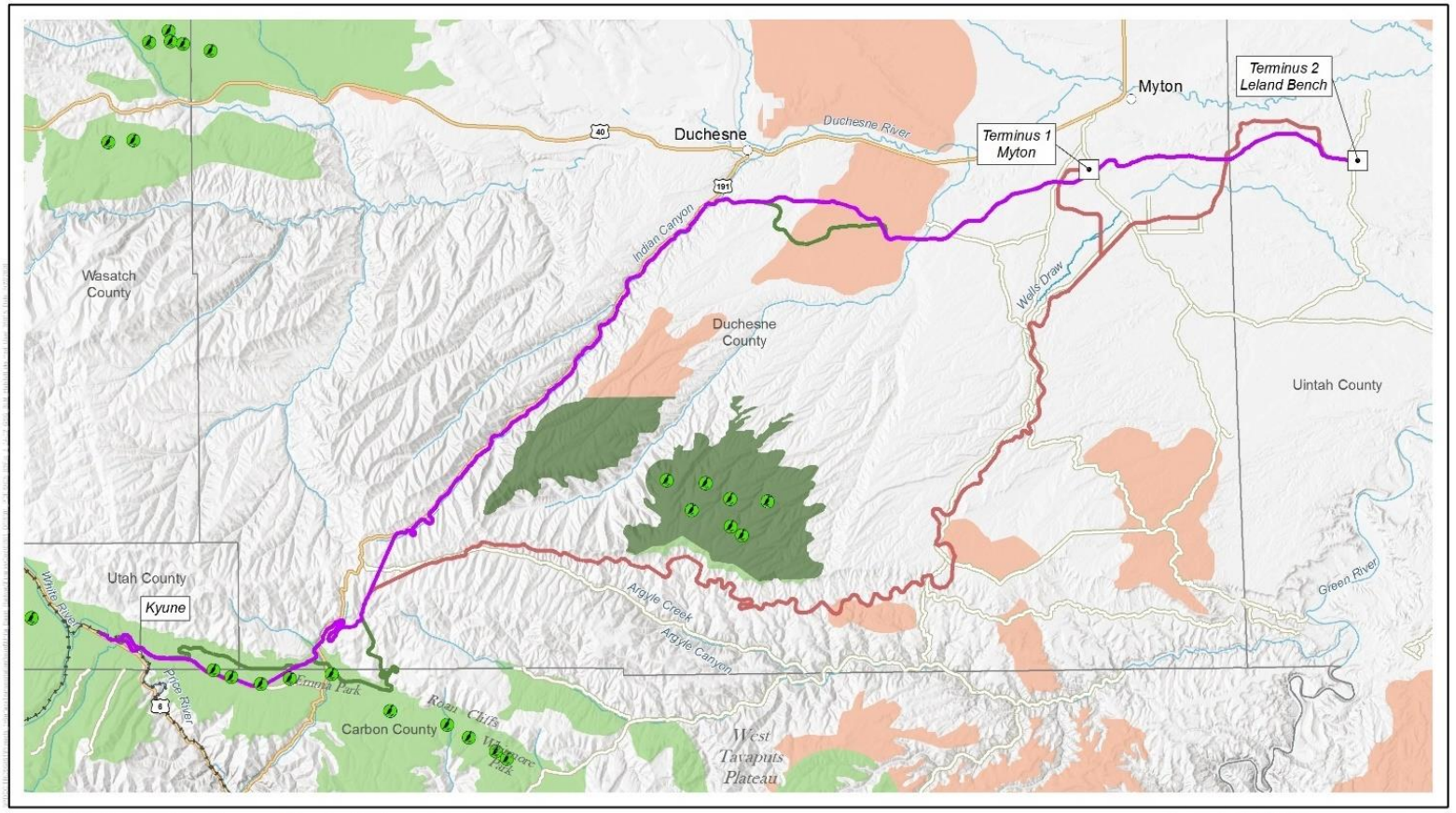

Table 3.4-~~10~~13. BLM Greater Sage-Grouse Habitat in the Study Areas (acres)

Habitat Type[a] ~~Species~~	Action Alternative		
	Indian Canyon	Wells Draw	Whitmore Park
Priority	~~1,667.5~~	~~1,667.5~~	~~2,283.2~~
BLM	346.4	346.6	83.6
SITLA	198.0	198.0	322.1
Tribal	0	0	0
UDOT	11.6	11.6	10.0
Forest Service	0	0	0
Private	1,111.4	1,111.2	1,867.4
Total	**1,667.4**	**1,667.4**	**2,283.1**
General	~~640~~	~~345.9~~	~~811.8~~
BLM	0	345.9	0
SITLA	0	0	0
Tribal	0	0	0
UDOT	0	0	0
Forest Service	0	0	0
Private	640.1	0	811.8
Total	**640.1~~2,307.5~~**	**345.9~~2,013.4~~**	**811.8~~3,095.0~~**

Notes:

Source: Coalition 2020a; BLM 2015b

[a] Acreages are of greater sage-grouse habitat type in the field survey study areas for each Action Alternative. Table 3.4-23 shows the BLM greater sage-grouse habitat that would be permanently and temporarily disturbed within the project footprint for each Action Alternative.

BLM = Bureau of Land Management; SITLA = Utah School and Institutional Trust Lands Administration; UDOT = Utah Department of Transportation

3.4.3 Environmental Consequences

Construction and operation of the proposed rail line would result in impacts on biological resources. This subsection first presents the potential impacts that would be the same for all three Action Alternatives and then compares the potential impacts that would be different across the Action Alternatives. For comparison purposes, this subsection also discusses the status of biological resources under the No-Action Alternative. Section 3.3, *Water Resources*, also addresses impacts that could be associated with biological resources.

3.4.3.1 Impacts Common to All Action Alternatives

This subsection discusses potential impacts on wildlife, fish, vegetation, and special status species that would be the same across the three Action Alternatives. Potential impacts caused by rail line construction are discussed first for each resource, followed by potential impacts caused by rail operations.

Wildlife

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), would result in temporary and permanent impacts on wildlife. The intensity of these impacts would vary depending on the type of habitat and specific species affected.

Habitat Loss or Alteration and Wildlife Displacement

Construction of the proposed rail line would remove or alter habitat, resulting in permanent habitat loss or alteration in the rail line footprint. Table 3.4-~~4~~ 6 shows the types of habitats (vegetation communities) that construction would affect. Habitat removal could affect many different species of wildlife, including birds, mammals, reptiles, amphibians, and invertebrates. In areas where construction would involve clearing habitat, the wildlife that currently occupies the habitat 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 wildlife. Displacement could affect normal foraging, migratory, and breeding behaviors. Displacement could also reduce survival and productivity because animals might need to expend more energy to locate suitable replacement habitat. In addition, wildlife that is less familiar with new habitat areas might be more susceptible to predation, which can affect survival.

The effects of habitat clearing on wildlife 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). Some affected habitats in the temporary footprint, such as shrub and forest, would take many years to be completely restored to pre-construction conditions. In some areas of the rail line~~project~~ footprint beyond the rail bed, habitat would be permanently altered from forested habitat to herbaceous or low shrub habitats ~~as a result of temporary clearing~~. The abrupt change in habitat type could lead to a permanent change in the types of species present in the area because some species of wildlife avoid herbaceous and low shrub habitats while others seek out these habitats.

Construction of any of the Action Alternatives would require removal or alteration of riparian vegetation, which is an important habitat in the western United States, although the extent of these impacts would vary between the three Action Alternatives (Section 3.4.3.2, *Impact Comparison between Action Alternatives*). In the western United States, riparian ecosystems make up a small percentage of the landscape but provide essential ecological functions for both human and wildlife populations (Poff et al. 2012). They are unique because they have high species diversity and densities, as well as high productivity, and they allow for continuous interactions to occur between riparian, aquatic, and upland ecosystems through the exchange of energy, nutrients, and species (Poff et al. 2012). Therefore, the removal or alteration of riparian vegetation during construction would have negative impacts on wildlife.

The big game species in the study area (bighorn sheep, elk, moose, mule deer, and pronghorn antelope) all have year-long substantial and/or crucial habitat in the project footprint (Table 3.4-1). Construction of any of the Action Alternatives would temporarily and permanently remove or alter big game habitat, although the extent of these impacts would vary between the Action Alternatives (Section 3.4.3.2, *Impact Comparison between Action Alternatives*). Construction activities could also

degrade forage quality for big game species because dust generated by construction equipment and vehicles could be deposited on vegetation near construction areas. This impact would be localized and temporary, lasting only the duration of construction. Big game species would be able to forage on undisturbed vegetation in the areas surrounding the construction footprint.

Large amounts of cleared vegetation and debris placed in piles along the proposed rail line during construction could attract bark beetles, which, if the conditions are right, could result in an increase in bark beetle populations and risk a potential bark beetle outbreak. While bark beetles are native to U.S. forests and play important ecological roles, they can cause extensive tree mortality, which can have indirect effects on wildlife that use forest habitats. This issue is of important concern in any forested area, particularly in and around Ashley National Forest.

Wildlife 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 on wildlife would depend mostly on the timing of construction activities. However, the large areas of suitable habitat around the Action Alternatives would be sufficient to allow for wildlife movement and dispersal. To minimize impacts related to the clearing of habitat, the Coalition has proposed voluntary mitigation that would commit the Coalition to limit ground clearing to only the areas necessary for project-related construction and to restore and revegetate temporarily cleared areas using native vegetation (VM-16, VM-22, BIO-MM-16). In addition, OEA is recommending mitigation requiring the Coalition develop a detailed reclamation and mitigation plan for temporarily disturbed areas (BIO-MM-16). To address potential adverse impacts on potential bark beetle outbreaks, OEA is recommending mitigation requiring the Coalition remove all cleared vegetation and green debris from construction areas, including trees from woodland and timber clearing (BIO-MM-14).

Wildlife Injury or Mortality

Construction of the proposed rail line could result in wildlife mortality or injury from construction-related collisions or crushing. Collisions or crushing would be more likely to affect smaller, less mobile species (e.g., reptiles, insects) that are not able to move away quickly from construction equipment. Collisions would be less likely to occur with larger animals (e.g., big game animals) and birds because these animals could move more quickly and vacate a construction area. Because construction vehicles typically move at slow speeds, OEA expects that wildlife fatalities and injuries from operating construction equipment would be infrequent. While some species could be more susceptible to collisions or crushing, many species would likely vacate a construction area once land clearing activities start and noise and construction equipment become perceptible to wildlife. This temporary impact would only last for the duration of construction.

The installation of new infrastructure that would also be present during rail operations could disrupt predator–prey relationships in and near the project footprint. For example, new infrastructure or movement corridors associated with the proposed rail line could provide certain predators with greater hunting opportunities. This could result in increased mortality rates in the prey of those predators. As species adapt to disturbances associated with operations, predator–prey relationships would stabilize.

Accidents and Spills of Hazardous Materials

An accidental release of hazardous materials during construction (e.g., spill of gasoline, oil, or lubricants) could affect individual animals 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, the Coalition has proposed voluntary mitigation that would commit the Coalition to obtaining a Section 401 water quality certification and an NPDES permit,[7] and developing a SWPPP (VM-19, VM-21, VM-26). These measures would limit the chance of a spill occurring and would facilitate a rapid cleanup should a spill occur.

Habitat Fragmentation and Barrier to Movement

During and following construction, the proposed rail line would split large areas of contiguous habitat into smaller areas. The presence of the rail line could create a barrier to wildlife, both physically and behaviorally. Physical barriers created by rail corridors mainly affect small animals, such as lizards and amphibians (Barrientos and Borda-de-Agua 2017). Smaller animals are less mobile and find it more difficult to cross rail corridors due to the physical and visual obstructions created by the railbed itself. Large animals (e.g., big game) would be physically able to cross the rail corridor, but their perception of a barrier (e.g., visual effects of rail infrastructure) could still prevent them from crossing the rail corridor. Fences along rail corridors can create partial barriers to movement for larger species, especially big game species. Disrupted migration could prevent herds from reaching high-quality forage, which could result in physiological stresses and the expenditure of greater amounts of energy to reach resources beyond the study area. However, the Coalition is not proposing fences unless a landowner agreement requests one. Barriers to movement could affect the ability of wildlife to disperse into other areas to feed, shelter, or breed, which could affect population-level genetics by restricting gene flow. On a landscape level, some of the habitat within and adjacent to the study areas is already fragmented by highways, small roads, and other development, and the addition of the proposed rail line would not greatly increase habitat fragmentation impacts relative to existing landscape conditions in most locations. Nevertheless, localized impacts from fragmentation would result in vegetation changes and changes in species composition along the corridor. However, even with habitat fragmentation, the large areas of suitable habitat around the Action Alternatives would be sufficient to allow for wildlife movement and dispersal. To minimize the potential impacts related to habitat fragmentation, the Coalition has committed to working with UDWR, the Ute Indian Tribe, and adjacent landowners to define areas of the right-of-way that can be left without fences to maintain big game movement~~migration~~ corridors and to installing wildlife-safe fences to confine livestock within grazing allotments where practical and necessary (VM-40, VM-41). In addition, OEA is recommending mitigation requiring the Coalition develop a big game movement corridor crossing plan in consultation with the Ute Indian Tribe, UDWR, OEA, and appropriate land management agencies (BIO-MM-18).

[7] NPDES is the permit system mandated by Clean Water Act Section 402 to control pollutants in waters of the United States. With the exception of Tribal trust lands, the U.S. Environmental Protection Agency (EPA) has delegated authority to issue NPDES permits to the state of Utah, referred to as Utah Pollutant Discharge Elimination System (UPDES) permits. On Tribal trust lands, EPA retains authority to issue NPDES permits. NPDES refers to both UPDES and NPDES permits in this section.

Operations

Rail operations could temporarily and permanently affect wildlife by introducing new sources of noise in the study 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).

Wildlife Injury or Mortality

Operation of the proposed rail line could injure or kill individual wildlife due to collisions with trains and maintenance equipment. Higher mortality rates would likely occur where the density of wildlife is higher. For big game species, these higher density areas would be at the locations of the movement corridors that cross or parallel the Action Alternatives (see Appendix G, *Biological Resources Figures,* for figures displaying the movement corridors for each big game species along the Action Alternatives). Species that feed on carrion (flesh of dead animals), species that could use the rail corridor for moving around, and species that would use habitats adjacent to the rail line would have an increased chance of being killed by a collision.

Habitat Degradation and Wildlife Displacement

Rail operations could displace wildlife and render adjacent habitat unsuitable. There is evidence that disturbances (e.g., noise, vibration, and light) associated with operation of a rail line could cause some species to avoid habitat near the rail line, such as meadow/grassland birds (Waterman et al. 2002). In contrast, other studies suggest that some wildlife species (e.g., reptiles, woodland bird species, and small and large mammals) ignore or adapt to rail line disturbances (Ghosh et al. 2010; Wiacek et al. 2015; Mundahl et al. 2013). The severity of rail line disturbance depends on the species and on the degree of the disturbance (Rytwinski and Fahrig 2012).

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 species to expend more energy near the rail line or avoid the area. Noise related to rail operations could cause birds, especially raptors, to abandon their nests with the subsequent demise of young. 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. Wildlife would also be less familiar with new areas and at greater risk of predation, thus, limiting survival of offspring or adults.

OEA anticipates that most wildlife 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. Research indicates that different species of animals habituate to noise differently; some animals habituate to noise after several repetitions of exposure, while other species do not become accustomed to high noise levels (Schulte-Werning et al. 2007). OEA expects that noise-related effects on wildlife would mostly occur within approximately 350 feet of the proposed rail line. This is the distance at which wayside noise levels would be at or above 100 dBA

SEL, the noise level at which studies have shown animals (domestic and wild) exhibit a response to train noise (FRA 2005). For horn noise at grade crossings, noise-related effects could occur out to approximately 460 feet from the locomotive. Noise levels beyond this distance are not expected to adversely affect wildlife (FRA 2005).

Dust from train movement and maintenance activity would lower the quality of forage adjacent to the proposed rail line, potentially causing wildlife to expend more energy seeking higher quality forage in undisturbed areas further away from the proposed rail line. Spills of fuels, oils, lubricants, or other hazardous materials during maintenance activities could degrade habitats and prevent use for forage or refuge. However, the large areas of suitable habitats around the Action Alternatives would be sufficient to allow for wildlife 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 wildlife habitat over time. Potential wildfire impacts, including OEA's recommended mitigation related to wildlife, is discussed further under *Vegetation*.

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 would provide perches for predatory birds, facilitating predation on ground-nesting birds and other small wildlife. 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. The Coalition would construct power lines 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 wildlife impacts. Communications towers, which would be approximately 120 feet tall, also could present a collision hazard, especially for larger migrating birds. Each Action Alternative would require the construction of four communications towers. At the same time, birds could use power lines, communications towers, or fences for nesting and perching (Daniel and Willard 1978), potentially providing a beneficial impact on many bird species (Table 3.4-~~2~~4), such as increasing individual reproductive success. 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 (BIO-MM-1).

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 in Section 3.2, *Rail Operations Safety*, 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 Action Alternative. OEA expects that most accidents involving loaded trains would be small and that only approximately one-quarter of those accidents would result in a release of any size.

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, 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 large 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 and less mobile wildlife. 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. The Coalition has also proposed voluntary mitigation measures to minimize potential impacts related to spills of crude oil. These measures include a commitment to prepare a hazardous materials emergency response plan; comply with applicable regulations and tribal ordinances related to the safe and secure transportation of hazardous materials; and notify appropriate federal, state, and tribal environmental agencies as required under federal, state, and tribal law in the event of a reportable spill (VM-11, VM-12, VM-13, VM-14, VM-15).

An accidental release of other hazardous materials during operations (e.g., fuel leaks from locomotives or maintenance vehicles) could affect individual animals 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 impacts related to the accidental release of hazardous materials during operations, the Coalition has proposed voluntary mitigation that would commit the Coalition to promptly cleaning up the spill and notifying responsible agencies in accordance with federal, state, and tribal regulations (VM-10) This measure would help contain a release of hazardous materials and would facilitate rapid cleanup should a spill occur.

Fish

Construction

Construction of the proposed rail line would require installation of bridges and culverts at stream crossings and stream realignments (Section 3.3, *Water Resources*, Table 3.3-12, lists the bridges, ~~and~~ culverts, and stream realignments for each Action Alternative). Bridge and culvert construction could affect fish by injuring or killing fish from in-stream construction activities, increasing sedimentation and turbidity in streams, prohibiting fish movement, degrading water quality from release of hazardous materials into streams, and temporarily and permanently removing riparian vegetation. Stream realignments would permanently fill stream channels and replace them with a

human-made channel. Potential direct impacts (e.g., fish injury or mortality) would be more likely to occur in those surface waters that support fish and have fish present at the time of construction (e.g., perennial and intermittent streams). Ephemeral streams, which can support fish during flows and provide important indirect support to downstream fish populations (e.g., delivering nutrients to perennial streams), could be dry during construction, which would preclude these potential direct impacts on fish at the time of construction.

Injury or Mortality

Construction could kill or injure fish if they are present at the construction site. Use of construction equipment in active stream channels could injure or crush eggs, larvae, and juvenile fish. Construction equipment could compact soils and substrate in the streambed, resulting in the death of larvae and eggs in or on substrate material. Where there is a soft sediment bottom, equipment movement could redirect streamflow. Portions of the streambed could become dry and isolated, resulting in mortality of fish. If water diversions and temporary dewatering are needed, developing eggs and pre-emergent larvae could dry out and die. Eggs, larvae, and juvenile fish would be more susceptible to harm than adult fish from in-stream construction because they are immobile or less mobile. Adult and larger juvenile fish are generally more capable of moving away from disturbance and would likely avoid exposure where possible. Potential fish mortality impacts from construction activities would be localized and temporary, lasting only for the duration of the in-stream construction.

Bridge construction could also injure fish from underwater noise associated with vessel movement and installation of bridge supports. OEA expects that the Coalition would install bridge foundations by either pile driving or inserting steel piles into drilled shafts, depending on site-specific geological conditions. Sound generated by pile driving has the potential to affect fish in several ways, ranging from alteration of behavior to physical injury or mortality, depending on the intensity and characteristics of the sound, the distance and location of the fish in the water column relative to the sound source, the size and mass of the fish, and the fish's anatomical characteristics (Hastings and Popper 2005). Injuries can include change in hearing capability or actual damage to the inner ear, damage or destruction of the swim bladder, other cellular and molecular effects, and possible adverse effects on eggs and larvae (Hastings and Popper 2005). Behavioral effects, such as fish leaving or avoiding an area, have been observed (Swan 2012).

The effects of hearing loss in fish could increase their vulnerability to predators and/or result in a reduced ability to locate prey, inability to communicate, or inability to sense their physical environment (Hastings and Popper 2005). Popper et al. (2005) found that fish experiencing temporary shifts in sensitivity to sounds were able to recover in less than 18 hours post exposure. Therefore, OEA expects that potential noise impacts on fish would be temporary, lasting only the duration of in-stream construction.

To minimize the risk of killing or injuring fish during in-stream construction work, OEA is recommending mitigation requiring the Coalition comply with any federal, state, or local in-water work windows and timing restrictions for the protection of fish species (BIO-MM-2). In addition, OEA is recommending mitigation requiring the Coalition implement appropriate noise-attenuating methods, such as bubble curtains or wood or nylon pile caps when installing or proofing pilings below the ordinary high water line of fish-bearing streams to minimize underwater sound impacts on fish (BIO-MM-3).

Sedimentation and Turbidity

Construction activities could increase sedimentation and turbidity (cloudiness) in streams that the proposed rail line would cross. High turbidity levels can directly affect the physical health of fish and alter fish behavior, but the severity of these impacts would vary depending on species susceptibility. High turbidity affects gill function, blood sugar levels, and osmoregulatory[8] function in fish. Increased turbidity can also affect fish behavior by changing responses to predation risk and predator avoidance, changing foraging ability, and reducing territoriality. Species that can tolerate high turbidity levels (e.g., carp) would be less susceptible to elevated turbidity compared to species that are less tolerable of turbidity (e.g., trout), particularly if the impacts were to be short term and did not cause permanent habitat degradation.

Increased sediment in streams would affect juvenile fish by changing their behavior and/or affecting their food sources. Many juvenile fish primarily eat macroinvertebrates that live on the streambed. Fill and sediment in the stream could be deposited on the substrates where the macroinvertebrates live, which would reduce the food available for juvenile fish. Excessive sediment in a stream could decrease the depth of the stream and reduce the number of pools and the physical space available for juvenile fish, which could decrease their survival rate.

Although construction would cause sedimentation and turbidity in surface waters, this impact would be temporary. To minimize impacts related to the sedimentation and turbidity in surface waters, the Coalition has proposed voluntary mitigation that would commit the Coalition to obtaining a Clean Water Act Section 401 water quality certification and an NPDES permit, and developing a SWPPP (VM-19, VM-21, VM-26). The Section 401 water quality certification, SWPPP, and NPDES permit conditions would contain site-specific measures to avoid and minimize erosion and sedimentation that could cause turbidity in surface waters and thereby minimize potential impacts on fish.

Fish Movement

Culvert and bridge installation in fish-bearing streams could involve installing temporary pipe and pump system streamflow diversions to bypass streamflow around the culvert and bridge work area, which would temporarily impede fish movement. In-stream work could involve installing a cofferdam to create a dry work area. This would temporarily prevent fish migration through the culvert and bridge installation area and would block access to upstream and downstream habitat. This impact would be temporary, lasting only for the duration of the culvert and bridge installation.

To minimize impacts on fish movement during construction, OEA is recommending mitigation requiring the Coalition use block-nets to remove and exclude fish from in-water work areas, to the extent practicable and comply with reasonable federal, state, or local in-water work windows and timing restrictions for the protection of fish species, and other reasonable requirements of the in-water work permits (BIO-MM-2, BIO-MM-4).

Water Quality

Construction would require the use of common construction materials (e.g., concrete, paint, and wood preservatives) and petroleum products (e.g., fuels, lubricants, and hydraulic fluids) that may be toxic to fish. These materials could be stored within the rail corridor and/or in staging areas

[8] Osmoregulation is the process of maintaining salt and water balance across membranes.

during construction. An accidental spill of hazardous materials in or near a water body could reach a stream or other surface water and degrade water quality, which would affect the health or survival of fish and fish habitat. The nature and extent of these impacts would depend on the type and amount of material that would reach the surface waters, the timing of the spill, and the ecological sensitivity of the affected habitat. Spills during the spawning season would be particularly detrimental for nest-spawning species or species with immobile (nondrifting) eggs, but the high-flow conditions that are typical during the spring spawning season would dilute spills and limit the duration and severity of their impacts. Spills in slow-moving water environments (e.g., pool and backwater habitats) could result in long-term impacts because there would not be regular water flows to flush toxic materials from these habitats.

Although construction could result in hazardous materials reaching surface waters, which could affect fish, the Coalition has proposed voluntary mitigation that would commit the Coalition to obtaining a Clean Water Act Section 401 water quality certification and an NPDES permit, and developing a SWPPP (VM-19, VM-21, VM-26) to reduce impacts on surface water quality.

In-stream and Riparian Habitats

Construction would require some removal or alteration of riparian vegetation, which would influence the quality of fish habitat by reducing streambank stability; food production; and in-stream cover, complexity, and temperature. The severity of these impacts would depend on the area of affected riparian habitat and the duration of construction activities, which would vary across the three Action Alternatives (Section 3.4.3.2, *Impact Comparison between Action Alternatives*). Woody debris from streamside trees provides cover and habitat complexity, which are essential components of fish habitat. Riparian zones are sources of terrestrial nutrients, such as insects and plant matter, that are transported to the aquatic system. Riparian vegetation also provides shade and an insulating canopy that moderates water temperatures and creates a natural filter that reduces the transport of fine sediment to the stream. The roots of riparian vegetation stabilize streambanks, providing foraging habitat and cover for rearing fish. The removal of riparian vegetation would eliminate these benefits for fish. It would also accelerate the natural processes of channel meandering and erosion, which could affect fish habitat. To minimize the impacts related to the removal or alteration of riparian vegetation, OEA is recommending mitigation requiring the Coalition avoid clearing riparian vegetation to the extent practicable, minimize the area and duration of construction-related disturbances in riparian areas and along streambanks, and immediately restore and revegetate temporarily disturbed riparian areas with native vegetation once construction is complete (BIO-MM-5).

Stream Channel Realignment

Construction of any of the Action Alternatives would involve realigning stream channels. These stream realignments would occur in areas where the proposed rail line would parallel a stream and topography, existing infrastructure (e.g., highways), or rail line design standards (e.g., curvature ratio) would make it impossible to avoid the stream. Stream realignments would involve filling segments of the stream and moving the stream channel to maintain hydrologic connectivity and stream flow, which would result in the permanent loss of the original aquatic habitat and stream functions. The stream realignment process typically involves designing and constructing the new stream channel prior to placement of permanent fill in the existing stream. Once construction of the new channel is completed, flow is diverted into the new channel by blocking flow into the existing stream channel. After flow is established in the new channel, the original stream is permanently

filled. If improperly designed, realigned stream channels can result in physical and ecological impacts on aquatic habitat. Primary changes to the channel dimensions and materials, alongside changes to flow velocity or channel capacity, can lead to various problems, such as heightened erosion or deposition, changes in geomorphology and sediment transport dynamics downstream, hanging tributaries, vegetation loss, water quality issues, and associated ecological impacts (Flatley et al. 2018). Fundamentally, a realigned channel replaces a natural section of a stream with a human-made channel. The artificial channel is usually different from the natural channel in several ways, such as being shorter and steeper, having different bed and bank material, having no floodplain, and cutting across tributaries, all of which can lead to erosion, flooding, and fish passage issues (Flatley et al. 2018). OEA is recommending mitigation requiring the Coalition to design all stream realignments in consultation with USACE as part of the CWA Section 404 permitting process compensatory mitigation plan development to ensure that affected stream functions are adequately mitigated (WAT-MM-3). In addition, the Coalition has proposed voluntary mitigation that would commit the Coalition to relocating streams using bioengineering methods and obtaining stream alteration permits (VM-29, VM-31). These mitigation measures would offset the impact of stream realignments, but some impacts would be unavoidable.

Operations

Fish Movement

The main impact from rail operations on fish would be related to culverts. Culverts could impede fish movement if not designed properly. Common issues with culverts that restrict fish movement include increased water velocity, decreased water depth, and culvert outlet drop heights. The effects of culverts can alter instream habitats and fish assemblages (Huser 2009). Culverts have localized effects on instream habitat and fish assemblages. In addition, culverts can disrupt the normal, within-stream movements of some macroinvertebrates. Macroinvertebrates are key components of the aquatic ecosystem and are important food sources for fish. Disruption to the movement and dispersal of stream macroinvertebrates could reduce available habitat and lead to genetic isolation of some populations (Vaughan 2002). OEA is recommending mitigation requiring the Coalition implement culvert best management practices to ensure all culverts are sufficiently clear of debris to avoid flow blockages and design culverts to allow aquatic organisms to pass relatively unhindered, which would minimize impacts on fish movement (WAT-MM-10, BIO-MM-6).

Accidents and Spills of Hazardous Materials

As discussed previously, the characteristics of Uinta Basin crude oil would limit its spread if it were spilled into or near surface water as a result of a derailment or other accident. The Coalition has proposed voluntary mitigation measures to minimize potential impacts related to spills of crude oil. These measures include a commitment to preparing a hazardous materials emergency response plan; complying with applicable regulations and tribal ordinances related to the safe and secure transportation of hazardous materials; and notifying appropriate federal, state, and tribal environmental agencies as required under federal, state, and tribal law in the event of a reportable spill (VM-11, VM-12, VM-13, VM-14, VM-15). Some temporary impacts on aquatic habitat and fish would be unavoidable in the event of a spill, and could include impacts from disturbances caused by collecting globules of oil during cleanup.

An accidental release of other hazardous materials during operations (e.g., fuel leaks from locomotives or maintenance vehicles) could affect aquatic habitat and fish if the fuel were to reach

the aquatic habitat. OEA expects that any release of hazardous materials during operations would be small and would affect a limited area. To minimize impacts related to the accidental release of hazardous materials during operations, the Coalition has proposed voluntary mitigation that would commit the Coalition to promptly cleaning up the spill and notifying responsible agencies in accordance with federal, state, and tribal regulations (VM-10). These measures would prevent large quantities of fuel (if any) reaching aquatic habitat.

Vegetation

Construction

Construction of the proposed rail line would involve clearing, excavating, and filling within the project footprint, which would result in the permanent or temporary loss or alteration of vegetation. Construction could also affect vegetation beyond the project footprint as a result of fugitive dust emissions, the introduction and/or spread of noxious weeds, and releases of hazardous materials. The extent of such impacts would vary based on the affected vegetation, relative abundance of vegetation, 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 vegetation 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 vegetation 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 vegetation for construction staging areas, temporary access roads, and temporary facilities. Disturbed areas in the temporary footprint would be reclaimed and revegetated following construction. Some affected vegetations types in the temporary footprint, such as shrub and forest, would take many years to be completely restored to pre-construction conditions. Although vegetation would return to the ~~temporarily~~ disturbed areas in the rail line footprint beyond the rail bed, the clearing of shrub and forest vegetation would alter and likely permanently change the vegetation cover class to nonwoody herbaceous cover classes. The Coalition has proposed voluntary mitigation stating that it would limit ground disturbance to only the areas necessary for project-related construction activities and would revegetate disturbed areas when construction is completed (VM-21, VM-26). In addition, OEA is recommending mitigation requiring the Coalition to develop a detailed reclamation and mitigation plan for temporarily disturbed areas (BIO-MM-16).

Even if the Coalition's voluntary mitigation measures are implemented, however, permanent impacts on vegetation in the project footprint would be unavoidable.

Plant Germination and Growth

The movement of heavy equipment and supplies during construction could compact the soil, which would affect vegetation 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, especially in areas with steep terrain. 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 (WAT-MM-5).

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 offsite 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. 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 native vegetation and result in altered vegetation structure, a reduction in plant species richness, and overall disruption of the plant ecosystem. To minimize impacts related to noxious and invasive weeds, the Coalition has proposed voluntary mitigation that would commit the Coalition to preparing a noxious and invasive weed control plan, in consultation with the Ute Indian Tribe, that will include the policies and strategies in Utah's *Strategic Plan for Managing Noxious and Invasive* Weeds, where practical (VM-38, BIO-MM-15). If implemented, this mitigation measure would minimize impacts related to noxious and invasive weeds during project-related construction.

Dust Deposition

The operation of construction equipment would generate fugitive dust from loose soil. Accumulation of fugitive dust on vegetation in or near the project footprint could affect plant growth by inhibiting photosynthesis and reducing vegetation density and plant diversity. More tolerant native plant species could benefit from decreased competition. 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 aggressiveness of noxious weeds would determine vegetation response and the intensity of impacts. However, any dust accumulation on vegetation would be temporary and would last only for the duration of construction or until a precipitation event washes away the accumulated dust. To minimize impacts related to fugitive dust deposition, the Coalition has proposed voluntary mitigation that would commit the Coalition to implementing fugitive dust

controls (VM-23). If this measure is implemented, OEA expects that the impact of construction-related fugitive dust on vegetation would be temporary and insignificant.

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 vegetation and affect plant growth. The extent of the impact would depend on the type and volume of the material spilled, the location, and the vegetation 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. To minimize impacts related to accidental spills of hazardous materials, the Coalition has proposed voluntary mitigation that would commit the Coalition to obtaining a Clean Water Act Section 401 water quality certification and an NPDES permit, and developing a SWPPP (VM-19, VM-21, VM-26).

Operations

The primary operation activities that could affect vegetation 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. 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 vegetation, 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. To minimize impacts related to the accidental release of hazardous materials during operations, the Coalition has proposed voluntary mitigation that would commit the Coalition to promptly clean up the spill and notify responsible agencies in accordance with federal, state, and tribal regulations (VM-10). However, some impacts related to vegetation control within the rail line footprint would still be unavoidable.

Pollutant Deposition

Rail operations would release pollutants that could affect vegetation. The two most important types of pollutants associated with rail transport are 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 vegetation within the rail line footprint. OEA does not expect that these pollutants would affect vegetation 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, *Proposed Action and Alternatives*, Table 2-7), which would increase the potential for locomotive carbon particle buildup and emissions. Locomotives 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 vegetation 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 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 2000). To the extent that conditions become drier due to climatic trends, there could be greater potential for wildfire starts earlier and later in the year, and more acreage burned.

The probability of a train-induced wildfire would be very low because of several reasons, including improvements in locomotive technology and the fact that trains make up a small percentage of fire starts (Table 3.4-~~5~~7). OEA is also recommending mitigation requiring the Coalition develop and implement a wildfire management plan in consultation with appropriate state and local agencies,

including local fire departments (BIO-MM-7). 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. If OEA's recommended mitigation is implemented, OEA concludes that the impacts of wildfire on vegetation would not be significant.

In response to comments received on the Draft EIS, OEA considered impacts from rail operations along existing rail line segments downline of the proposed rail line for some biological resources, including impacts related to wildfires. Trains originating or terminating on the proposed rail line could be an ignition source for wildfires along existing rail lines outside of the study area. However, because those existing rail lines are active rail lines that have been in operation for many years, construction and operation of the proposed rail line would not introduce a new ignition source for wildfires along the downline segments. For the reasons discussed above, the probability that a train would trigger a wildfire is very low, and nearly 90 percent of the area along the downline segments consists of very low, low, nonburnable, and water WHP classes (Table 3.4-9). Therefore, the downline wildfire impact of the proposed rail line would not be significant. Because the Coalition does not and would not operate any existing rail lines downline of the proposed rail line, the Board cannot impose mitigation on the Coalition that would address potential downline impacts from rail operations related to wildfire. However, any trains operating on downline segments would be subject to the same federal regulations as the proposed rail line for rail transportation, including regulations related to fire safety and the transportation of crude oil by rail, which would minimize potential wildfire impacts.

Accidental Spills of Hazardous Materials

Oil could spill from a tanker car onto vegetation should a train accident or derailment occur. Section 3.4.3.1, *Impacts Common to All Action Alternatives, Wildlife*, 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 vegetation would be minimized. However, some permanent and temporary vegetation impacts could occur during cleanup, which could result in the loss of vegetation and establishment and spread of noxious and invasive weeds. The Coalition has proposed voluntary mitigation measures to minimize potential impacts related to spills of crude oil. These measures include a commitment to preparing a hazardous materials emergency response plan; complying with applicable regulations and tribal ordinances related to the safe and secure transportation of hazardous materials; and notifying appropriate federal, state, and tribal environmental agencies as required under federal, state, and tribal law in the event of a reportable spill (VM-11, VM-12, VM-13, VM-14, VM-15).

Special Status Species

Construction

The types of construction-related impacts on special status species would be the same as those described previously for wildlife, fish, and vegetation in general. These potential impacts include individual injury or mortality, habitat loss or alteration, wildlife displacement, and barriers to movement.

Endangered Species Act-Listed Species

Construction of the proposed rail line could affect 10 federally listed species: Barneby ridge-cress, Pariette cactus, Uinta Basin hookless cactus, Ute ladies'-tresses, Canada lynx, Mexican spotted owl, bonytail, Colorado pikeminnow, humpback chub, and razorback sucker. OEA is currently conducting ESA Section 7 consultation with USFWS to assess the potential effects of the proposed rail line on ESA-listed species and has prepared a ~~Draft~~ Biological Assessment that discusses those potential effects (Appendix I, ~~*Draft*~~ *Biological Assessment*). The ~~Draft~~ Biological Assessment concludes that construction and operation of any of the Action Alternatives would be likely to adversely affect Colorado pikeminnow, humpback chub, bonytail, razorback sucker, Pariette cactus, Uinta Basin hookless cactus, and Ute ladies-tresses. Depending on the Action Alternative, construction and operation of the proposed rail line would also be likely to adversely affect Barneby ridge-cress. The ~~Draft~~ Biological Assessment also concludes that construction and operation of any of the Action Alternatives would be not likely to adversely affect Canada lynx and Mexican spotted owl. To minimize impacts on federally listed threatened and endangered species, OEA is recommending mitigation requiring the Coalition implement all terms and conditions of USFWS' Biological Opinion (BIO-MM-9).

Bald and Golden Eagles

Eagles have been observed in the study areas for all Action Alternatives. During field surveys, the Coalition did not observe any eagle nests in the study areas. Suitable nesting, perching, and foraging habitat exists in the study areas and immediate vicinity. While golden eagles are common throughout Utah and habitat is found throughout the study area, bald eagles primarily winter in Utah for a few months out of the year. The Utah GAP Analysis (1999) modeled potential bald eagle habitat in Utah and very little breeding habitat was identified. In the event an eagle nest is observed in or near construction sites prior to or during construction, OEA is recommending mitigation requiring the Coalition comply with the Bald and Golden Eagle Protection Act and to follow the USFWS *National Bald Eagle Management Guidelines* (USFWS 2007), which may include contacting USFWS to coordinate efforts to avoid or minimize disturbance of eagle nests (BIO-MM-8). Such efforts might include the following.

- Maintaining a distance between the construction activity and the nest (distance buffers).
- Maintaining forested (or natural) areas between the construction activity and around nest trees (landscape buffers).
- Avoiding disruptive (loud) activities during the breeding season.

If take[9] of an eagle or eagle nest cannot be avoided, the Coalition would obtain a permit from USFWS. To minimize potential impacts on eagles, OEA is recommending mitigation requiring the Coalition abide by the reasonable requirements of all appropriate federal and state permits to possess, relocate, or disassemble a bald or golden eagle nest, and/or work within 0.5 mile of a bald eagle or golden eagle nest, regardless of whether the nest is active or inactive (BIO-MM-11). OEA is recommending the Coalition also follow the guidelines for avoiding and minimizing impacts set out

[9] The Bald and Golden Eagle Protection Act defines take as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." Disturb means "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

in the *Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances* for the protection of bald and golden eagles, as applicable (BIO-MM-11). OEA expects that construction-related impacts on eagles would be insignificant if OEA's recommended mitigation measures are implemented.

Sensitive Species

The types of construction-related impacts on BLM- and Forest Service-sensitive species would be the same as those described previously for wildlife, fish, and vegetation in general, including potential injury or mortality, habitat loss or alteration, wildlife displacement, and barriers to movement. If individual sensitive plant species are located in the project footprint, they could be permanently removed or temporarily disturbed during construction. If sensitive fish or wildlife species are encountered during construction, they could be injured or killed. However, given the mobility of the sensitive wildlife species that might be present during construction, OEA expects injury or mortality of a sensitive wildlife species would be rare. Those species that depend on habitats that are permanently removed would be displaced and forced to use similar adjacent habitat. The large areas of suitable habitats around the Action Alternatives would be sufficient to allow for wildlife movement and dispersal. OEA consulted with the Forest Service and developed a Biological Evaluation (Appendix H, *Biological Evaluation*) to assess the potential effects on Forest Service-designated sensitive species. The Biological Evaluation concludes that operation of the proposed rail line would have little or no impact on Forest Service-designated sensitive species within Ashley National Forest. To address construction-related impacts on sensitive species, OEA is recommending mitigation requiring the Coalition implement the requirements of land management agencies that would issue rights-of-way across public lands, including BLM and the Forest Service, as appropriate (LUR-MM-3, LUR-MM-4). These requirements would include appropriate measures to minimize impacts on BLM- and Forest Service-designated sensitive species.

Greater Sage-Grouse

In general, development activities adversely affect greater sage-grouse populations due to habitat loss, presence of humans and infrastructure, and noise (Aldridge and Boyce 2007; Aldridge 2005; Doherty et al. 2008; Holloran 2005; Lyon and Anderson 2003; Walker et al. 2007). There is also evidence suggesting that greater sage-grouse avoid noise from human activities independent of disturbance, associated infrastructure, and habitat fragmentation and that intermittent noise, such as traffic noise, has a larger effect on greater sage-grouse than continuous noise (Blickley et al. 2012).

Any of the Action Alternatives would cross greater sage-grouse habitat, including breeding, nesting, brood-rearing, and wintering habitat, and would result in the permanent removal of and temporary disturbance to that habitat (Table 3.4-~~9~~ 12 and Table 3.4-~~10~~13). Disturbed areas in the temporary footprint would be reclaimed and revegetated following construction; however, affected sagebrush habitat in the temporary footprint would take many years to be restored to pre-construction conditions due to the difficulty in reestablishing this type of habitat (Meyer 1992). Greater sage-grouse could also be killed or injured by collisions with construction equipment, workers' vehicles, and project-related infrastructure (fences and communications towers). Noise from construction equipment and the presence of people in construction areas could displace greater sage-grouse and cause them to disperse into habitat areas further away from the rail line (Appendix J, *Bureau of Land Management Greater Sage-Grouse Resource Management Plan Compliance*). There are also several greater sage-grouse leks in the vicinity of all three Action Alternatives within the Carbon SGMA

(Figure 3.4-1). The habitat removal and noise associated with construction of the proposed rail line could cause greater sage-grouse to avoid or abandon those leks, especially if construction were to take place during the breeding season.

Because the Indian Canyon Alternative and the Wells Draw Alternative would cross mapped greater sage-grouse PHMAs on BLM-administered lands, construction of the proposed rail line would need to comply with the BLM *Utah Greater Sage-Grouse Approved Resource Management Plan Amendment* (BLM 2015a) for BLM to be able permit either of these Action Alternatives. OEA is recommending mitigation requiring the Coalition abide by the requirements of that plan and BLM's other reasonable requirements related to construction impacts on greater sage-grouse if the Board were to authorize either the Indian Canyon Alternative or the Wells Draw Alternative (BIO-MM-13). Because the Whitmore Park Alternative would not cross BLM-administered lands, mitigation related to the BLM plan would not be necessary. OEA is also recommending mitigation requiring the Coalition follow the reasonable requirements of the *Utah Conservation Plan for Greater Sage Grouse* (State of Utah~~UDWR~~ 2019~~e~~) during project-related construction for any of the Action Alternatives (BIO-MM-13). Section 3.4.3.2, *Impact Comparison between Action Alternatives*, describes how these plans relate to each of the Action Alternatives. In addition, the Coalition's voluntary mitigation states that the Coalition will execute a Mitigation Agreement with UDWR (Appendix K, *Greater Sage-Grouse Mitigation Strategies Memorandum*) to address impacts within the Carbon SGMA. That agreement will specify the actions that the Coalition would take to avoid and minimize impacts on greater sage-grouse habitat during construction and operation of the proposed rail line, as well as strategies for compensatory mitigation (VM-35).

Operations

The types of operations-related impacts on special status species would be the same as those described previously for wildlife, fish, and vegetation in general. These potential impacts include individual injury or mortality, habitat fragmentation and degradation, wildlife displacement, barriers to movement, and affects from accidents and spills of hazardous materials.

Endangered Species Act-Listed Species

Operation of the proposed rail line could affect 10 federally listed species: Barneby ridge-cress, Pariette cactus, Uinta Basin hookless cactus, Ute ladies'-tresses, Canada lynx, Mexican spotted owl, bonytail, Colorado pikeminnow, humpback chub, and razorback sucker. OEA is currently conducting ESA Section 7 consultation with USFWS to assess the potential impacts of the proposed rail line on ESA-listed species and has prepared a ~~Draft~~ Biological Assessment discussing those potential impacts (Appendix I, ~~*Draft*~~ *Biological Assessment*). The ~~Draft~~ Biological Assessment concludes that construction and operation of any of the Action Alternatives would be likely to adversely affect Colorado pikeminnow, humpback chub, bonytail, razorback sucker, Pariette cactus, Uinta Basin hookless cactus, and Ute ladies'-tresses. Depending on the Action Alternative, construction and operation of the proposed rail line would also be likely to adversely affect Barneby ridge-cress. The ~~Draft~~ Biological Assessment also concludes that construction and operation of any of the Action Alternatives would be not likely to adversely affect Canada lynx and Mexican spotted owl. To minimize impacts on federally listed threatened and endangered species, OEA is recommending mitigation requiring the Coalition implement all terms and conditions of USFWS' Biological Opinion (BIO-MM-9).

In response to comments received on the Draft EIS, OEA considered impacts from rail operations along existing rail line segments downline of the proposed rail line for some biological resources,

including impacts on ESA-listed species. OEA notes that the existing UP rail line between Kyune and Denver crosses critical habitat for the Colorado pikeminnow and razorback sucker in the Green River and closely parallels critical habitat for the Colorado pikeminnow, razorback sucker, humpback chub, and bonytail in the Colorado River. Because the existing UP rail line is an active rail line that has been in operation for many years, impacts from rail operations on ESA-listed fish species and critical habitat along that rail line have occurred and would continue to occur, and the addition of up to 9.5 additional trains per day, on average, would not substantially change the severity of those impacts. Along any active rail line, including the existing UP rail line, minor leaks or drips of fuel or lubricants from locomotives, maintenance vehicles, or rail cars may occur during rail operations and, if those substances were to be deposited into waterways, impacts on aquatic organisms, including fish, would occur. However, the proposed rail line would not introduce a new potential source of pollution along the existing UP rail line because that rail line is already an active rail line that has been in operation for many years. OEA notes that, if a large release of crude oil were to occur on a downline segment that crosses or is immediately adjacent to critical habitat for ESA-listed fish species, adverse impacts on those fish would occur. However, as discussed in Section 3.1, *Rail Operations Safety*, the probability of a large spill of crude oil is very low and such an outcome is not reasonably foreseeable. Because the Coalition does not and would not operate any existing rail lines downline of the proposed rail line, the Board cannot impose mitigation on the Coalition that would address potential downline impacts from rail operations on the Colorado pikeminnow, razorback sucker, humpback chub, and bonytail. However, any trains operating on downline segments would be subject to the same federal regulations as the proposed rail line for rail transportation, including regulations for the transportation of crude oil by rail, which would minimize potential impacts on ESA-listed species and critical habitat.

Bald and Golden Eagles

As discussed previously, OEA expects that a noise level of 100 dBA SEL from rail operations would disturb wildlife. This level of noise could occur in areas up to 350 feet from the rail line for wayside noise and 460 feet from the rail line for horn noise. If eagles nested within these distances from the rail line, train operation and noise, as well as noise from maintenance activities, could disturb nesting eagles, potentially resulting in failed nesting attempts or mortality to young. While there is some evidence that eagle nests are more successful when located farther away from highways and rail lines, (Mundahl et al. 2013), eagles are known to successfully nest near disturbances that they do not directly associate with humans (Mundahl et al. 2013; Peterson 1986). Because wildlife-disturbing noise impacts from rail operations would primarily occur within 350 to 460 feet of the proposed rail line, OEA does not anticipate significant impacts on eagles if the Coalition's voluntary mitigation measures and OEA's additional recommended mitigation measures are implemented (BIO-MM-8, BIO-MM-11).

Train operation could injure or kill individual eagles due to collisions with trains. Eagles feed on carrion (flesh of dead animals), and dead animals along the rail line from train strikes could attract eagles where they would be susceptible to train strikes, which could result in eagle injury or death. The maximum speed for a loaded train would be 10 to 20 miles per hour, which would likely be slow enough for large and medium sized animals, including eagles, to see and hear the train in advance of a potential strike, allowing animals 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 animal strikes, including eagles feeding on carrion. OEA is recommending mitigation requiring the Coalition ensure that rail employees engaged in routine rail line inspections remove any carcasses observed

along the rail line in order to minimize potential eagle strikes and record and submit data on carcass observations to UDWR (BIO-MM-12).

Sensitive Species

The types of operations-related impacts on BLM- and Forest Service-designated sensitive species would be the same as those described for common species, including potential injury or mortality, habitat fragmentation and degradation, wildlife displacement, and barriers to movement. Train operations would likely result in long-term avoidance of the area near the proposed rail line by greater sage-grouse. OEA consulted with the Forest Service and developed a Biological Evaluation (Appendix H, *Biological Evaluation*) to assess the potential effects to Forest Service-designated sensitive species. The Biological Evaluation concludes that operation of the proposed rail line would have little or no impact on Forest Service-designated sensitive species on Forest Service lands. To address operations-related impacts on sensitive species, OEA is recommending mitigation requiring the Coalition implement the requirements of land management agencies that would issue rights-of-way across public lands, including BLM and the Forest Service, as appropriate (LUR-MM-3, LUR-MM-4). These requirements would include appropriate measures to minimize impacts on BLM- and Forest Service-designated sensitive species.

Greater Sage-Grouse

During rail operations, any of the Action Alternatives would result in noise impacts on greater sage-grouse habitat and leks, but the severity of these impacts would vary between the three Action Alternatives (Section 3.4.3.1, *Impact Comparison between Action Alternatives*). As discussed previously, noise from human activities, and especially intermittent noise, can affect greater-sage grouse behavior. The introduction of new noise sources near leks during the breeding season could cause greater sage-grouse to avoid or abandon the leks. If the Board were to authorize the Indian Canyon Alternative or the Wells Draw Alternative (both of which would cross PHMA on BLM-administered lands), OEA is recommending mitigation requiring the Coalition ensure that rail operations would comply with the BLM *Utah Greater Sage-Grouse Approved Resource Management Plan Amendment* (BLM 2015a) (BIO-MM-13). OEA is also recommending mitigation requiring the Coalition ensure that rail operations would comply with the *Utah Conservation Plan for Greater Sage Grouse* (State of Utah~~UDWR~~ 2019~~e~~) for any of the Action Alternatives (BIO-MM-13). Section 3.4.3.2, *Impact Comparison between Action Alternatives*, describes how these plans relate to each of the Action Alternatives. In addition, the Coalition's voluntary mitigation states that the Coalition will execute a Mitigation Agreement with UDWR to address impacts within the Carbon SGMA. That agreement will specify the actions that the Coalition would take to avoid and minimize impacts on greater sage-grouse habitat during construction and operation of the proposed rail line, as well as strategies for compensatory mitigation (VM-35).

In response to comments received on the Draft EIS, OEA considered impacts from rail operations along existing rail line segments downline of the proposed rail line for some biological resources, including impacts on greater sage-grouse. OEA does not expect that increased rail traffic on existing rail lines would adversely affect greater sage-grouse because greater sage-grouse using habitat along those existing rail lines would have already become habituated to intermittent train noise due to exposure to such noise on a regular basis over the many years that the existing rail lines have been in operation. Because the Coalition does not and would not operate any existing rail lines downline of the proposed rail line, the Board cannot impose mitigation on the Coalition that would address potential downline impacts from rail operations on greater sage-grouse. However, any

trains operating on downline segments would be subject to the same federal regulations as the proposed rail line for rail transportation, including regulations establishing speed and noise limits for rail operations, which would minimize potential impacts on greater sage-grouse.

3.4.3.2 Impact Comparison between Action Alternatives

This subsection compares the potential environmental impacts from construction and operation on wildlife, fish, vegetation, and special status species between the three Action Alternatives.

Wildlife

Construction and Operations

Construction and operation of any of the Action Alternatives would affect wildlife habitat. The most important factor for comparing impacts on wildlife between the Action Alternatives is the amount of habitat that would be permanently removed. In general, a greater amount of habitat removed would result in more severe impacts, such as impacts from displacement of wildlife, fragmentation of habitat, and blocking wildlife movement.

Table 3.4-~~11~~ 14 shows the area of big-game habitat (bighorn sheep, elk, moose, mule deer, and pronghorn antelope) that construction of each Action Alternative would permanently remove or temporarily disturb. The Wells Draw Alternative would permanently remove the greatest area of all big-game habitats, followed by the Whitmore Park Alternative and the Indian Canyon Alternative. However, the Whitmore Park Alternative would permanently remove the greatest area of big game crucial habitat (2,723.5 acres), followed by the Indian Canyon Alternative (2,406.3 acres) and Wells Draw Alternative (2,367.9 acres). Notably, there is significant overlap of big game habitats for the different big game species (see Appendix G *Biological Resources Figures* for big game habitats along the Action Alternatives), and the permanent and temporary habitat impacts affect multiple big game species in those areas of habitat overlap. Of the big-game species with habitat in the study areas, the Action Alternatives would affect mostly elk and mule deer habitat. Table 3.4-15 shows the percent of crucial habitat that construction of each Action Alternative would disturb (combined permanent and temporary removal) within each big game species' UDWR management unit. The percent area of crucial big game habitat affected in each management unit compared to all crucial habitat available in the management unit is less than 1 percent for all big game species for all management units. In addition, the habitat in the temporarily disturbed areas would be restored, resulting in a lesser percent area of crucial habitat impact than what is shown in Table 3.4-15 once restoration is complete. This small percent area of crucial habitat impact across all Action Alternatives is anticipated to have minimal indirect effects on big game populations and is not anticipated to affect the management and sustainability of big game populations within the available big game habitats in the UDWR management units. Table 3.4-16 shows the number of big game movement corridor crossings for each Action Alternative. The total number of affected movement corridors is similar between the Action Alternatives, with the Wells Draw Alternative having the smallest number. However, the Wells Draw Alternative would affect the greatest number of high importance movement corridors compared to the Indian Canyon Alternative and Whitmore Park Alternative.

Table 3.4-~~11~~14. Permanent Removal of and Temporary Disturbance to Big-Game Habitat (acres)

Species	Permanent Removal			Temporary Disturbance		
	Indian Canyon	Wells Draw	Whitmore Park	Indian Canyon	Wells Draw	Whitmore Park
Bighorn sheep (*Ovis canadensis*)~~264.7571.0264.7333.01,201.8332.9~~						
Crucial habitat	264.7	32.9	264.7	333.0	63.8	332.9
Substantial habitat	-	538.2	-	-	1,138.1	-
Elk (*Cervus canadensis*)~~1,017.02,111.11,107.21,579.73,957.32,199.6~~						
Crucial habitat[a]	693.8	691.1	878.1	1,041.4	1,309.5	1,740.7
Substantial habitat[a]	323.3	1,419.9	229.0	538.3	2,647.7	458.9
Moose (*Alces alces*)	**~~681.9~~**	**~~1,126.7~~**	**~~748.6~~**	**~~1,045.6~~**	**~~1,758.1~~**	**~~1,556.4~~**
Crucial habitat[b]	457.5	776.8	524.2	750.1	1,272.4	1,261.3
Substantial habitat[b]	224.4	349.9	224.5	295.5	485.7	295.1
Mule deer (*Odocoileus hemionus*) ~~1,171.62,163.11,261.82,089.84,114.22,709.7~~						
Crucial habitat[c]	841.3	520.1	907.5	1,295.7	844.0	1,807.1
Substantial habitat[d]	330.4	1,643.0	354.3	794.1	3,270.2	902.6
Pronghorn antelope (*Antilocapra americana*) ~~286.4365.7380.5572.3928.8850.0~~						
Crucial habitat	149.0	347.0	149.0	362.6	874.9	362.6
Substantial habitat	137.4	18.8	231.5	209.6	53.9	487.4
~~Total~~	**~~3,421.86~~**	**~~6,337.76~~**	**~~3,762.8~~**	**~~5,620.3~~ ~~4,803.9~~**	**~~11,960.2~~ ~~10,712.6~~**	**~~7,648.66,~~ ~~342.6~~**

Notes:

[a] Includes summer, winter, and year-long habitats.

[b] Includes winter and year-long habitats.

[c] Includes year-long, winter, and summer habitats.

[d] Includes year-long and winter habitats.

Sources: Coalition 2020a; UDWR 2019b

Table 3.4-15. Percent Removal of All Big Game Crucial Habitats in UDWR Management Units

UDWR Management Unit	Percent Removal of All Crucial Habitats in Management Unit[a]		
	Indian Canyon	Wells Draw	Whitmore Park
Bighorn sheep (*Ovis canadensis*)			
Nine Mile Unit 11	0.07	0.01	0.06
Wasatch Mountains Unit 17	<0.01	0[b]	<0.01
Elk (*Cervus canadensis*)			
Central Mountains Unit 16	<0.01	<0.01	<0.01
Nine Mile Unit 11	0.17	0.23	0.26
South Slope Unit 9	0.01	0[b]	0.01
Wasatch Mountains Unit 17	0.05	0.05	0.08
Moose (*Alces alces*)			
Nine Mile Unit 11	0.38	0.97	0.59
Wasatch Mountains Unit 17	0.04	0.04	0.05

UDWR Management Unit	Percent Removal of All Crucial Habitats in Management Unit[a]		
	Indian Canyon	Wells Draw	Whitmore Park
Mule deer (*Odocoileus hemionus*)			
Central Mountains Unit 16	<0.01	<0.01	<0.01
Nine Mile Unit 11	0.25	0.12	0.30
South Slope Unit 9[b]	0	0	0
Wasatch Mountains Unit 17	0.04	0.04	0.06
Pronghorn antelope (*Antilocapra americana*)			
Central Mountains Unit 16[b]	0	0	0
Nine Mile Unit 11	0.13	0.31	0.13

Notes:

[a] The percentage is based on the project footprint, which includes both the rail line footprint and temporary footprint.

[b] A zero means the project enters that UDWR management unit, but does not cross crucial habitat within that management unit.

Sources: Coalition 2020a; UDWR 2015, 2017a, 2017b, 2018, 2019b, 2019d, 2021a

Table 3.4-16. Big Game Movement Corridors Crossed by the Action Alternatives

Species	Number of Big Game Movement Corridor Crossings[a]		
	Indian Canyon	Wells Draw	Whitmore Park
Bighorn sheep (*Ovis canadensis*)	6(H)	N/A	6(H)
Elk (*Cervus canadensis*)	6(L), 3(M), 5(H)	1(L), 3(M), 14(H)	6(L), 1(M), 3(H)
Mule deer (*Odocoileus hemionus*)	9(M)	6(M)	11(M)
Pronghorn antelope (*Antilocapra americana*)	3(M), 4(H)	7(H)	3(M), 4(H)
Total	**36** 6(L), 15(M), 15(H)	**31** 1(L), 9(M), 21(H)	**34** 6(L), 15(M), 13(H)

Notes:

Source: UDWR 2021b

[a] Does not include any big game movement corridors that cross above proposed tunnels; L=low importance movement corridor; M=medium importance movement corridor; H = high importance movement corridor

N/A = not applicable because there are no bighorn sheep movement corridors along the Wells Draw Alternative

In addition to big-game habitat, OEA calculated the temporary and permanent impacts on other wildlife habitat types. The Wells Draw Alternative would permanently remove the greatest area of vegetation/land cover (Table 3.4-~~12~~17) that provides habitat for wildlife, followed by the Whitmore Park Alternative and Indian Canyon Alternative. The Indian Canyon Alternative would permanently remove the greatest area of riparian vegetation (Table 3.4-~~13~~18), which provides high-value wildlife habitat, followed by the Whitmore Park Alternative and Wells Draw Alternative.

Table 3.4~~12~~-17. Permanent Removal of and Temporary Disturbance to Vegetation Communities (acres)

Vegetation Communities by Land Cover Type	Permanent Removal			Temporary Disturbance		
	Indian Canyon	Wells Draw	Whitmore Park	Indian Canyon	Wells Draw	Whitmore Park
Agriculture/Altered Land Cover Type						
Agriculture	84.0	12.3	83.7	125.7	48.8	126.0
Developed, Medium – High Intensity	0.7	--	0.7	3.4	--	3.4
Developed, Open Space – Low Intensity	--	--	--	--	0.7	--
Disturbed, Oil Well	--	2.3	--	--	11.9	--
Recently Chained Pinyon-Juniper Areas	--	2.6	--	--	3.7	--
Subtotal	**84.7**	**17.2**	**84.4**	**129.1**	**65.1**	**129.4**
Badland/Bedrock Land Cover Type						
Colorado Plateau Mixed Bedrock Canyon and Tableland	13.2	123.6	13.8	34.3	248.1	34.5
Inter-Mountain Basins Shale Badland	55.8	19.8	55.8	152.9	43.0	152.9
Rocky Mountain Cliff and Canyon	12.1	188.2	8.0	21.1	314.6	25.4
Subtotal	**81.1**	**331.6**	**77.6**	**208.3**	**605.7**	**212.8**
Forest/Woodland Land Cover Type						
Colorado Plateau Pinyon-Juniper Woodland	109.4	799.9	122.2	186.7	1,597.6	230.4
Inter-Mountain West Aspen-Mixed Conifer Forest and Woodland Complex	0.004	0.04	--	0.8	1.5	0.8
Invasive Southwest Riparian Woodland and Shrubland	--	1.3	--	--	2.0	--
Rocky Mountain Aspen Forest and Woodland	41.5	36.2	15.3	69.2	59.8	29.4
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	34.6	4.3	34.0	51.2	10.0	49.8
Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland	33.0	51.7	24.2	61.9	84.2	59.5
Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland	4.0	15.9	3.1	21.4	25.0	16.2
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	--	--	--	0.8	0.8	0.8
Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland	--	16.8	--	4.9	13.6	4.9
Subtotal	**222.5**	**926.1**	**198.8**	**396.9**	**1,794.5**	**391.8**
Meadow/Grassland Land Cover Type						
Inter-Mountain Basins Semi-Desert Grassland	14.3	25.8	14.4	20.6	64.5	21.2
Invasive Annual Grassland	2.3	5.4	2.0	5.2	9.0	5.5

Vegetation Communities by Land Cover Type	Permanent Removal			Temporary Disturbance		
	Indian Canyon	Wells Draw	Whitmore Park	Indian Canyon	Wells Draw	Whitmore Park
Rocky Mountain Alpine-Montane Wet Meadow	51.1	10.9	42.0	37.9	9.3	31.8
Southern Rocky Mountain Montane-Subalpine Grassland	16.6	49.8	26.3	19.5	86.5	43.5
Subtotal	**84.3**	**91.9**	**84.7**	**83.2**	**169.3**	**102.0**
Open Water Land Cover Type	**0.7**	**0.1**	**0.7**	**3.8**	**2.3**	**3.8**
Shrubland Land Cover Type						
Colorado Plateau Mixed Low Sagebrush Shrubland	129.4	166.3	131.8	211.0	441.2	239.1
Colorado Plateau Pinyon-Juniper Shrubland	51.7	41.4	66.7	83.9	103.2	144.9
Inter-Mountain Basins Big Sagebrush Shrubland	170.4	204.8	175.6	255.4	410.4	346.9
Inter-Mountain Basins Greasewood Flat	44.9	40.0	42.6	113.8	104.1	110.6
Inter-Mountain Basins Mat Saltbush Shrubland	1.2	10.5	1.2	16.7	20.3	16.7
Inter-Mountain Basins Mixed Salt Desert Scrub	149.4	218.4	152.0	425.6	540.4	431.6
Inter-Mountain Basins Montane Sagebrush Steppe	240.5	451.1	344.3	380.3	710.4	794.5
Inter-Mountain Basins Semi-Desert Shrub Steppe	35.0	34.1	35.2	86.5	80.3	86.6
Rocky Mountain Gambel Oak–Mixed Montane Shrubland	44.7	26.4	34.9	73.3	48.5	77.2
Subtotal	**867.2**	**1,193.0**	**984.3**	**1,646.5**	**2,458.8**	**2,248.1**
Total	**1,340.5**	**2,559.9**	**1,430.5**	**2,467.8**	**5,095.7**	**3,087.9**

Notes:
Sources: Coalition 2020a; USGS 2004

Fish

Construction and Operations

Construction and operation of any of the Action Alternatives would affect surface waters and, thus, fish habitat. The primary factors in differentiating potential fish impacts between the Action Alternatives include the area and/or linear distance of surface waters affected, the number of surface waters crossed, ~~and~~ the amount of riparian vegetation that would be permanently removed, and the number and distance of realigned streams. A greater number or area of surface waters affected and a greater amount of riparian vegetation removed generally indicates a greater potential for more severe impacts on fish.

Section 3.3, *Water Resources,* Table 3.3-11, shows the linear feet and area of surface water that would be disturbed by construction of the proposed rail line. The Wells Draw Alternative would affect the greatest area of surface waters and linear distances of streams, followed by the Whitmore

Park Alternative and Indian Canyon Alternative. Section 3.3, *Water Resources*, Table 3.3-12, shows the number of surface water crossings by structure type and the number of stream realignments for the Action Alternatives. The Wells Draw Alternative would cross the most surface waters and have the greatest number of crossing structures, followed by the Whitmore Park Alternative and Indian Canyon Alternative. Appendix F, *Water Resources Figures,* shows the streams crossed by the Action Alternatives. Section 3.3, *Water Resources*, Table 3.3-12 also shows the number of stream realignments and the distance of stream realignment impact (i.e., stream channel filled). The Indian Canyon Alternative and Whitmore Park Alternative would involve a similar number of stream realignments and would affect similar total distances of stream channel, while the Wells Draw Alternative would require the fewest stream realignments and would affect the smallest distance of stream channel. The Indian Canyon Alternative would permanently remove the greatest area of riparian vegetation (Table 3.4-~~13~~18), followed by the Whitmore Park Alternative and Wells Draw Alternative. All temporary riparian habitat disturbances would be reclaimed and revegetated following construction.

Another factor for comparing impacts on fish between the Action Alternatives is the area of erosive soils along each Action Alternative. A greater area of soil susceptible to water and wind erosion would increase the potential for sedimentation and turbidity impacts in surface waters during construction and operations and would thus result in a greater potential to affect fish. However, as discussed in Section 3.5, *Geology, Soils, Seismic Hazards, and Hazardous Waste*, only a small portion of the study areas for each Action Alternative is rated as having high risk to wind and water erosion. Based on soil erosion ratings, all Action Alternatives would have similar areas of susceptibility to wind erosion and water erosion. Therefore, OEA concludes that all of the Action Alternatives would have the same potential to result in minimal impacts from wind and water erosion that could degrade fish habitat.

Vegetation

Construction and Operations

The most important factors for differentiating impacts on vegetation between the Action Alternatives are the amount of vegetation that would be permanently removed; the amount of affected land that is likely to support invasive and noxious weeds; and the amount of land assigned a high WHP along the Action Alternatives.

Table 3.4-~~12~~ 17 shows the amount of vegetation that would be permanently removed or temporarily disturbed by construction of the rail line. The Wells Draw Alternative would permanently remove the greatest area of vegetation/land cover, followed by the Whitmore Park Alternative and Indian Canyon Alternative. Among the different types of land cover in the study area, shrublands (particularly the Colorado Plateau Mixed Low Sagebrush Shrubland vegetation community) and woodlands (particularly the Colorado Plateau Pinyon-Juniper Woodland vegetation community) would be most affected by any of the Action Alternatives.

Invasive and noxious weeds are associated with the Invasive Southwest Riparian Woodland vegetation community, the Shrubland land cover type, and the Invasive Annual Grassland land cover type. Invasive and noxious weeds are also generally associated with the Agriculture/Altered Land Cover type because of the disturbed conditions that are likely to support these species. A greater disturbance to these land cover types generally indicates a greater potential for the invasive and noxious weed impacts described in Section 3.4.3.1, *Impacts Common to All Action Alternatives*. OEA

expects that the Indian Canyon Alternative and Whitmore Park Alternative would involve the greatest potential for impacts related to invasive and noxious weeds because these Action Alternatives would affect a much greater area of land cover types associated with invasive and noxious weeds than the Wells Draw Alternative.

Table 3.4-~~13~~ 18 shows the amount of riparian vegetation that would be permanently removed or temporarily disturbed by construction of the rail line. The Indian Canyon Alternative would permanently remove the greatest area of riparian vegetation, followed by the Whitmore Park Alternative and Wells Draw Alternative.

Table 3.4-~~13~~18. Permanent Removal of and Temporary Disturbance to Riparian Vegetation (acres)

Action Alternative	Permanent Removal	Temporary Disturbance
Indian Canyon	36.5	57.1
Wells Draw	22.6	40.0
Whitmore Park	27.6	54.0

Notes:
Source: Coalition 2020a~~USGS 2004~~

As shown in Table 3.4-~~6~~8, the study areas for the Wells Draw Alternative contain the most amount of land assigned as high WHP, indicating that this alternative crosses through more area with high risk of wildfire compared to the other Action Alternatives. As discussed above, the probability of a train-induced wildfire is low, and OEA considers the potential for any of the Action Alternatives to result in wildfire unlikely if OEA's recommended mitigation measures are implemented. Under any of the Action Alternatives, the proposed rail line would act as a potential wildfire break (i.e., a gap in vegetation type that slows or stops a fire) if there was a wildfire in the area. Large portions of the Indian Canyon Alternative and Whitmore Park Alternative are located next to a highway, which already acts as a fire break. Thus, the potential added benefit of creating a new fire break in the landscape would be greatest for the Wells Draw Alternative compared to the other two Action Alternatives.

Special Status Species

Construction and Operations

Endangered-Species Act Listed Species

Construction and operation of any of the Action Alternatives would affect ESA-listed species. The primary factors in differentiating impacts between the Action Alternatives are the amount of potential and suitable habitat for each of the ESA-listed plant species that would be affected and the amount of potentially suitable snowshoe hare habitat (Canada lynx proxy habitat) that would be permanently removed. Although the snowshoe hare is not an ESA-listed species, it is an important prey animal for the Canada lynx, so the extent of snowshoe hare habitat can be used to estimate the extent of potentially suitable habitat for Canada lynx.

Table 3.4-~~14~~ 19 shows the amount of potential and suitable habitat for federally listed plant species that would be permanently removed or temporarily disturbed. The Whitmore Park Alternative would permanently remove the greatest total area of suitable habitat for federally listed plant species, followed by the Indian Canyon Alternative and Wells Draw Alternative. A greater amount of habitat removed generally indicates a more severe impact on the species in the study areas.

Table 3.4-~~14~~19. Permanent Removal of and Temporary Disturbance to Federally Listed Plant Species Suitable Habitat (acres)

	Permanent Removal			Temporary Disturbance[b]		
Plant Species	**Indian Canyon**	**Wells Draw**	**Whitmore Park**	**Indian Canyon**	**Wells Draw**	**Whitmore Park**
Barneby ridge-cress Pinyon-juniper habitat	20.0	0	34.3	46.0	0	97.3
Barneby ridge-cress white shale habitat	3.4	0	6.6	5.4	0	14.1
Pariette cactus	140.7	153.5	140.7	364.0	396.5	364.0
Pariette cactus/ Uinta Basin hookless cactus[a]	20.9	--	20.9	39.6	--	39.6
Uinta Basin hookless cactus	140.7	153.5	140.7	364.0	396.5	364.0
Ute's ladies'-tresses	1.5	<0.1	1.5	2.8	0.1	2.7

Notes:

[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] OEA considers temporary disturbance to federally listed plant species habitat to be a permanent impact even if revegetation were to occur.

Sources: USFWS 2011, 2019

Table 3.4-~~15~~ 20 shows the amount of potentially suitable snowshoe hare habitat (i.e., Canada lynx proxy habitat) that would be permanently removed or temporarily disturbed. The Wells Draw Alternative would permanently remove the greatest area of potentially suitable snowshoe hare habitat, followed by the Indian Canyon Alternative and the Whitmore Park Alternative. However, as stated in Table 3.4-~~8~~11, potentially suitable Canada lynx habitat in the study areas is marginal and is not considered sufficient to support a breeding female Canada lynx, and there are no historic lynx locations anywhere in or around the study area (Christensen and Groves pers. comm). 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 (USFWS 2017). Historical and future occurrences in Utah most likely represent occasional dispersing lynx (USFWS 2017). Therefore, Canada lynx are not likely to be present in the study area and OEA concludes that construction and operation of any of the Action Alternatives would not affect Canada lynx.

Table 3.4-~~15~~20. Permanent Removal of and Temporary Disturbance to Snowshoe Hare Habitat (acres)

Action Alternative	Permanent Removal	Temporary Disturbance
Indian Canyon	163.4	302.7
Wells Draw	165.2	263.3
Whitmore Park	83.7	203.7

Notes:

Habitat includes crucial year-long and substantial year-long habitats

Source: UDWR 2006

Table 3.4-~~16~~ 21 shows the amount of potentially suitable Mexican spotted habitat that would be permanently removed or temporarily disturbed. As stated in Table 3.4-~~8~~11, 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 impact any moderate quality habitat, while the Wells Draw Alternative would permanently and temporary impact a very small area of moderate quality habitat.

Table 3.4-~~16~~21. Permanent Removal of and Temporary Disturbance to Mexican Spotted Owl Habitat (acres)

	Permanent Removal		Temporary Disturbance	
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:
Habitat defined as high quality during Mexican spotted owl habitat surveys was not observed along any Action Alternative.
Source: Coalition 2020d

Forest Service Species

As described in Section 3.4.2.4, *Special Status Species*, Forest Service-sensitive wildlife species are unlikely likely to occur in the study areas or have little or no likelihood of being negatively affected by the Indian Canyon Alternative and Whitmore Park Alternative. Appendix H, *Biological Evaluation*, provides the details on this conclusion. The Wells Draw Alternative would not cross Forest Service land and would, therefore, not affect Forest Service sensitive species on Forest Service land.

BLM Sensitive Species

The Indian Canyon Alternative and Wells Draw Alternative would affect BLM-listed sensitive species on BLM-administered land. The Indian Canyon Alternative would permanently displace 46.3 acres of habitat on BLM-administered land and would temporarily affect 72.8 acres of habitat on BLM-administered land, while the Wells Draw Alternative would permanently displace 1,571.1 acres and temporarily affect 3,246.2 acres of habitat on BLM-administered land. Within these habitat areas on BLM-administered lands, the Coalition identified potentially suitable habitat for 14 BLM sensitive plants and three BLM sensitive plants along the Wells Draw Alternative and Indian Canyon Alternative, respectively (Coalition 2020a: Table 5-3). The Wells Draw Alternative would affect two Areas of Critical Environmental Concern on BLM-administered land that contain valuable habitat for BLM-designated sensitive species. Section 3.11, *Land Use and Recreation*, describes potential impacts related to construction and operation of the proposed rail line on those areas.

Tribal Species

Species of importance to the Ute Indian Tribe inhabit a range of habitats within the study area. In general, OEA expects that the Wells Draw Alternative would have the greatest impact on species of tribal importance because that Action Alternative would affect the greatest area of habitat in all categories of land cover (Table 3.4-~~12~~17). However, the Wells Draw Alternative would not affect habitat for species of tribal importance on Tribal trust land because it would not cross Tribal trust

lands. The Indian Canyon Alternative would permanently displace 121.2 acres of habitat on Tribal trust lands and would temporarily affect 257.3 acres of habitat on Tribal trust lands, while the Whitmore Park Alternative would permanently displace 118.4 acres and temporarily affect 254.9 acres of habitat on Tribal trust lands. To minimize potential impacts on species of importance to the Ute Indian Tribe, OEA is recommending mitigation requiring the Coalition implement the ~~reasonable~~ requirements of the Ute Indian Tribe for minimizing impacts on wildlife, fish, and vegetation on Tribal trust lands (BIO-MM-10, EJ-MM-1).

Greater Sage-Grouse

Any of the Action Alternatives would affect habitat for greater sage-grouse. Table 3.4-~~17~~ 22 shows the amount of UDWR-defined greater sage-grouse habitat that construction of each Action Alternative would permanently remove or temporarily disturb. The Whitmore Park Alternative would permanently remove the greatest area of UDWR-defined habitat and opportunity areas for greater sage-grouse.

Table 3.4-~~17~~22. Permanent Removal of and Temporary Disturbance to UDWR-defined Greater Sage-Grouse Areas (acres)

	Permanent Removal			Temporary Disturbance		
Type of Area	**Indian Canyon**	**Wells Draw**	**Whitmore Park**	**Indian Canyon**	**Wells Draw**	**Whitmore Park**
Habitat	275.8	275.8	377.8	413.7	413.7	869.0
Nonhabitat	8.6	8.6	74.8	9.4	9.4	218.3
Opportunity	10.1	10.1	30.1	36.7	36.7	36.3
Total	**294.5**	**294.5**	**482.8**	**459.8**	**459.8**	**1,123.6**

Notes:
Source: UDWR 2019b

Table 3.4-~~18~~23 shows the amount of BLM-defined greater sage-grouse habitat that would be permanently removed or temporarily disturbed. The Whitmore Park Alternative would permanently remove the greatest area of BLM-defined habitat for greater sage-grouse, followed by the Indian Canyon Alternative and Wells Draw Alternative.

Table 3.4-~~18~~23. Permanent Removal of and Temporary Disturbance to BLM-defined Greater Sage-Grouse Habitat (acres)

	Permanent Removal			Temporary Disturbance		
Type of Habitat	**Indian Canyon**	**Wells Draw**	**Whitmore Park**	**Indian Canyon**	**Wells Draw**	**Whitmore Park**
Priority	276.0	276.0	378.0	413.9	413.9	869.5
General	84.4	52.3	108.4	130.1	174.1	177.5
Total	**360.3**	**328.3**	**486.4**	**544.0**	**588.0**	**1,047.0**

Notes:
Source: BLM 2015b

Although the Whitmore Park Alternative would affect the largest total area of mapped greater sage-grouse habitat, OEA concludes that the Whitmore Park Alternative would minimize impacts on greater sage-grouse in the Carbon SGMA relative to the Indian Canyon Alternative and the Wells Draw Alternative. This conclusion is based on OEA's consultation with UDWR, BLM, and other

agencies involved through the inter-agency working group that OEA convened to study impacts on greater sage-grouse, as well as OEA's independent analysis. Compared to the other Action Alternatives, the Whitmore Park Alternative would be located farther away from most sage-grouse leks and associated summer brood-rearing habitat within the Carbon SGMA and would, therefore, result in less noise impacts on those areas. For example, Table 3.4-~~19~~24 shows the distance between each Action Alternative and the closest leks in the Carbon SGMA (Appendix L, *Noise and Vibration Analysis Methods*, provides more detail on predicted train noise). Each lek can be several acres in size, so the distances reported in Table 3.4-~~19~~24 are measured between the Action Alternatives and the center of the lek. The Indian Canyon Alternative and Wells Draw Alternative would each pass through or immediately adjacent to the Cabin Spring and Matt's Summit leks and would also pass within approximately 850 feet of the Horse Creek lek. The closest lek to the Whitmore Park Alternative would be more than 900 feet away from the rail centerline and all other leks would be more than 3,000 feet away.

Table 3.4-~~19~~24. Predicted Train Noise at the Closest Greater Sage-Grouse Leks in the Carbon Sage-Grouse Management Area

	Indian Canyon Alternative		Wells Draw Alternative		Whitmore Park Alternative	
Lek	Distance[a] (feet)	Train Noise[b] (dBA)	Distance (feet)	Train Noise (dBA)	Distance (feet)	Train Noise (dBA)
Antone Creek	22,665	37	22,664	37	5,141	49
Cabin Spring	167	79	168	79	3,751	52
Horse Creek	850	65	851	65	3,900	52
Matt's Summit	321	73	322	73	3,924	52
Moynier Meadow	1,928	58	1,927	58	3,099	54
Whitmore Park	5,820	48	5,819	48	905	64

Notes:

[a] Distance is measured from the rail line to the center point of the lek.

[b] The noise metric is equivalent sound level (Leq).

dBA = A-weighted decibels

Table 3.4-~~19~~24 also shows the estimated equivalent sound level (Leq) from wayside train noise that could occur at the center of each lek, measured in dBA. The Leq is equivalent to the total sound energy generated as a train passes by. As the table shows, the Leq from train noise could exceed 66 dBA at the Cabin Spring and the Matt's Summit leks under either the Indian Canyon Alternative or the Wells Draw Alternative. Although OEA did not conduct ambient noise monitoring in the Emma Park area, ambient noise elsewhere in the study area ranged from 33 dBA to 56 dBA, which suggests that those two leks could experience an increase in noise of at least 10 dBA and potentially as high as 43 dBA. A lek that experiences a 10-dBA increase in noise above ambient conditions is considered to potentially have significant impacts on leks under the BLM *Utah Greater Sage-Grouse Approved Resource Management Plan Amendment* (ARMPA) and the *Utah Conservation Plan for Greater Sage-Grouse* (State Plan) (State of Utah 2019).

The Indian Canyon Alternative and Wells Draw Alternative would cross BLM-administered lands in the Carbon SGMA. Therefore, in order for BLM to permit the proposed rail line, construction and

operation of either of those Action Alternatives would need to comply with the BLM ARMPA.[10] OEA consulted extensively with BLM greater sage-grouse experts and management plan administrators to determine which ARMPA management actions would apply by reviewing land ownership, greater sage-grouse habitat types and locations, greater sage-grouse lek locations, proposed rail line facilities (e.g., communications towers), and proposed rail line construction ground disturbance and operational noise disturbance for each Action Alternative. Table 3.4-~~20~~25 summarizes the ARMPA management actions that would apply under the 2015 and 2019 ARMPAs for each of the Action Alternatives; details of each management action are provided in Appendix J, *Bureau of Land Management Greater Sage-Grouse Resource Management Plan Compliance.* OEA determined that the Whitmore Park Alternative would not be subject to either the 2015 or 2019 ARMPAs because it does not cross BLM-administered lands. In contrast, certain management actions of the 2015 and 2019 ARMPAs would apply to the Indian Canyon Alternative and the Wells Draw Alternative because both would cross BLM-administered lands that are within PHMA in the Emma Park area (Table 3.4-~~20~~25).

Table 3.4-~~20~~25. Applicable ARMPA Management Actions by Action Alternative

Applicable BLM Management Actions[a]		Indian Canyon Alternative		Wells Draw Alternative		Whitmore Park Alternative	
2015 Plan	**2019 Plan**	**2015 Plan**	**2019 Plan**	**2015 Plan**	**2019 Plan**	**2015 Plan**	**2019 Plan**
MA-LR-1	MA-LR-1	Yes	Yes	Yes	Yes	No	No
MA-LR-2	MA-LR-2	Yes	Yes	Yes	Yes	No	No
MA-LR-7	N/A	No	No	Yes	No	No	No
MA-SSS-3	MA-SSS-3	Yes	Yes	Yes	Yes	No	No
MA-SSS-5	N/A	No	No	Yes	No	No	No
MA-SSS-6	N/A	No	No	Yes	Yes	No	No

Notes:

[a] Details on each management action are provided in Appendix J, *Bureau of Land Management Greater Sage-Grouse Resource Management Plan Compliance*.

MA-LR = Management Action - Lands and Realty; MA-SSS = Management Action – Special Status Species; N/A = not Applicable (management action in 2015 ARMPA has been removed in the 2019 ARMPA)

Management action MA-SSS-3 in both the 2015 and 2019 ARMPAs includes three elements that can be quantified and can aid BLM in determining if the proposed rail line would result in the need to amend the BLM Price and Pony Express Regional Management Plans (RMP):[11] exceedance of a 3-percent disturbance cap[12] of PHMA; noise exceedance of 10 decibels above ambient conditions

[10] The recent 2019 ARMPA for Utah (among other states) was suspended by a preliminary injunction issued by a U.S. District Court (Case No. 1:16-CV-83-BLW); as a result, the 2015 ARMPA is in effect until the injunction is lifted.

[11] The Emma Park area is covered by the BLM Price and Pony Express RMPs. Because the ARMPA amends BLM's greater sage-grouse management actions for all Utah BLM RMPs, BLM would need to amend the Price and Pony Express RMPs and not the ARMPA.

[12] The disturbance cap applies to PHMA within 1) PHMA associated with a greater sage-grouse population area, and 2) the project authorization scale. Therefore, there are two separate disturbance cap calculations that BLM considers. The disturbance caps stipulate~~s~~ that BLM cannot permit activities on BLM lands that would result in temporary or permanent disturbances to more than 3 percent of the total habitat in the PHMA, regardless of land ownership. In the PHMA, discrete anthropogenic disturbances (temporary or permanent) must be managed so they cover less than 3 percent of PHMA associated with a greater sage-grouse population area. If either of the 3-percent caps are~~is~~ exceeded, then no further disturbances are permitted by BLM in the PHMA until the disturbance has been reduced to less than the cap.

around known leks; and disturbance within a 3.1-mile buffer around known leks. Table 3.4-~~21~~26 summarizes the effects of the Action Alternatives in the context of these three elements.

Table 3.4-~~21~~26. Quantifiable Elements of Management Action MA-SSS-3

MA-SSS-3 Management Action Element	Indian Canyon Alternative	Wells Draw Alternative	Whitmore Park Alternative
Ground disturbance exceeds 3% disturbance cap associated with population area in PHMA?[a]	No	No	N/A[e]
Ground disturbance exceeds 3% disturbance cap at project authorization scale?[b]	Yes	Yes	N/A[e]
Noise levels exceed 10 decibels above ambient conditions at leks during breeding season?	Yes	Yes	N/A
Number of leks within 3.1-mile buffer[b~~c~~]	5	8[d]	N/A

Notes:

[a] There is no exceedance of the 3% disturbance cap under any Action Alternative. Indian Canyon Alternative = 2.45% and Wells Draw Alternative = 2.45%.

[b] The 3% disturbance cap is exceeded under both Action Alternatives: Indian Canyon Alternative = 3.1% and Wells Draw Alternative = 3.1%.

[~~b~~c] The distance for which anthropogenic land use and activity has observed effects found in the scientific literature for linear features (e.g., rail lines) (USGS 2014).

[d] The Wells Draw Alternative would be located within 3.1 miles of five leks in the Carbon SGMA and within 3.1 miles of three leks in the Anthro Mountain area.

[e] The Whitmore Park Alternative's impact on PHMA, while not subject to the ARMPA, would still be taken into consideration for any future BLM disturbance cap calculation needed for the approval of future actions that could occur on BLM lands in the PHMA.

PHMA = Priority Habitat Management Areas; N/A = not applicable (the ARMPA is not applicable to the Whitmore Park Alternative)

Because the project authorization scale disturbance caps would exceed 3 percent, OEA concludes that, as currently proposed, the Indian Canyon Alternative and Wells Draw Alternative would not be in compliance with the ARMPA or the BLM Price and Pony Express RMPs. In addition, ~~Because~~ rail operations would likely result in noise levels at leks that would be more than 10 dBA above ambient levels during the breeding season, and OEA concludes that, as currently proposed, the Indian Canyon Alternative and Wells Draw Alternative would not be in compliance with the ARMPA or the BLM Price and Pony Express RMPs. Therefore, for BLM to permit the Indian Canyon Alternative or the Wells Draw Alternative across BLM-administered lands, the ARMPA and/or the Price and Pony Express RMPs may need to be amended. Amendments to those BLM plans would not be necessary if the Board were to authorize the Whitmore Park Alternative because this alternative would not cross BLM-administered lands.

Construction and operation of any of the Action Alternatives would need to comply with the State Plan. Unlike the BLM ARMPA, the State Plan applies regardless of land ownership, and, therefore, applies to all activities that affect SGMAs.[13] However, the State Plan management actions and mitigation practices are voluntary and not required or regulated under state law. The State Plan recommends considering similar elements as the ARMPA in assessing greater sage-grouse and lek impacts, including the same 3-percent disturbance cap, the same 10-decibel noise threshold around leks during breeding season, and a buffer around leks for permanent disturbances (although smaller

[13] The State Plan's SGMAs largely coincided with BLM's PHMA. The only SGMA affected by the Action Alternatives would be the Carbon SGMA, which is located in the Emma Park area.

than the ARMPA) at 1 mile. For both the Indian Canyon Alternative and Wells Draw Alternative, the 10-decibel threshold would be exceeded for at least two leks and could be exceeded for up to five leks, depending on current ambient noise levels. There are four leks in the 1-mile buffer for the Indian Canyon Alternative and four~~seven~~ leks in the 1-mile buffer for the Wells Draw Alternative, and the 3-percent disturbance cap would not be exceeded for these Action Alternatives (Table 3.4-20~~2~~25).[14] For the Whitmore Park Alternative, the 3-percent disturbance cap would not be exceeded (2.66 percent)~~,~~; the 10-decibel noise threshold could be exceeded for at least one lek and potentially up to six leks, depending on current ambient noise levels~~,~~; and there are six leks within the 1-mile buffer.

As discussed previously, the Coalition has committed to executing a Mitigation Agreement with UDWR that will specify the actions that the Coalition would take to avoid and minimize impacts on greater sage-grouse habitat during construction and operation of the proposed rail line, as well as strategies for compensatory mitigation (VM-35). Compensatory mitigation could take the form of restoring wet meadow habitat in the Carbon SGMA. Wet meadows provide grasses, forbs and insects critical for meeting dietary needs of sage-grouse broods, especially during summer. In addition, OEA is recommending mitigation requiring the Coalition avoid construction in the Carbon SGMA during the nesting and breeding season (BIO-MM-19). Based on consultation with BLM, UDWR, and other agencies, as well as OEA's independent analysis, OEA concludes that, if the Board authorizes the Whitmore Park Alternative and if the Coalition's voluntary mitigation measures and OEA's additional recommended mitigation measures are implemented, impacts on greater sage-grouse from construction and operation of the proposed rail line would not be significant.

3.4.3.3 No-Action Alternative

Under the No-Action Alternative, the Coalition would not construct and operate the proposed rail line and there would be no impacts on biological resources.

3.4.4 Mitigation and Unavoidable Environmental Effects

Any of the Action Alternatives would result in impacts on biological resources, including the temporary and permanent disturbance of habitat; impacts on wildlife and fish movement; the spread of noxious and invasive weeds; and impacts related to noise, wildfires, fugitive dust emissions, water and soil quality, and the interaction of wildlife and rail-related features. Among the three Action Alternatives, the Wells Draw Alternative would generally result in the most impacts on wildlife, fish, and vegetation because it would affect the largest total area of land. Because of its longer length and larger footprint, the Wells Draw Alternative would temporarily and permanently disturb more habitat than the other Action Alternatives for most land cover types (Table 3.4-~~12~~17). However, the Indian Canyon Alternative would disturb the greatest area of riparian vegetation, which is a particularly important habitat type in the study area for wildlife and fish.

The Wells Draw Alternative would disturb the largest area of big game habitat, but the Whitmore Park Alternative would disturb the largest area of big game crucial habitat. The Wells Draw Alternative would~~and would also~~ result in the most impacts on fish movement due to the greater number of water crossings associated with that alternative. The Wells Draw Alternative would disturb the largest area of ~~potentially~~ suitable habitat for the ESA-listed Pariette cactus and the

[14] The State Plan requires that only the population area disturbance cap be calculated. Unlike BLM's ARMPA, the State Plan does not require calculation of the project authorization scale disturbance cap.

Uinta Basin hookless cactus, but would disturb the smallest area offor suitable habitat for the Barneby ridge-cress and Ute ladies'-tresses. The Wells Draw Alternative would not disturb any Pariette cactus or Uinta Basin hookless cactus Core 2 Conservation Areas, but the Indian Canyon Alternative and Whitmore Park Alternative would each result in impacts on Core 2 Conservation Areas in the same amount. The Whitmore Park Alternative would affect the greatest area of mapped greater sage-grouse habitat but would minimize impacts on greater sage-grouse because it would be located further away from most leks and from summer brood-rearing habitat than the Wells Draw Alternative or the Indian Canyon Alternative.

Due to the large number of species, including ESA-listed and other special status species, as well as the largely undisturbed condition of the study area, OEA concludes that impacts on biological resources related to habitat disturbance and noise would be significant under any of the Action Alternatives. If implemented, the Coalition's voluntary mitigation measures and OEA's additional recommended mitigation measures related to biological resources would lessen impacts of construction and operation on animal and plant species, including ESA-listed species (Chapter 4, *Mitigation*). Some significant impacts, however, including the permanent loss of existing habitat in the rail line footprint, would be unavoidable.