

3.3 Threatened, Endangered, and Other Special Status Animal and Plant Species

Threatened, endangered, and special status (TES) species that are addressed in this section include the following: species federally listed as threatened or endangered and those that are proposed or are candidates for listing in accordance with the Endangered Species Act (ESA) of 1973 (16 USC §§ 1531–1544 as amended); species listed by the Colorado Division of Wildlife (CDOW) as threatened, endangered, or as Species of Concern under the Wildlife Commission Regulations, Chapter 10; and species included on sensitive species lists developed by Region 2 of the US Forest Service (USFS) or by the Bureau of Land Management (BLM). Additionally, species identified by the Colorado Natural Heritage Program (CNHP) are addressed in this section. CNHP collects and maps rare and endangered species information in the state and has developed categories of imperilment for those species not appearing on federal or state lists.

Tier 1 level of analysis is broad in nature and does not include surveys of TES species habitats but addresses the potential for species to be affected by project alternatives. This will focus the Tier 1 decision on the primary elements of the alternatives that may cause impacts. Direct and indirect impacts will be further addressed in Tier 2 following specific TES species surveys.

3.3.1 TES Listing Agencies and Categories Species Listed, or Considered for Federal Listing as Threatened or Endangered

The ESA provides protection to select animal and plant species and includes protection of critical habitats necessary for their continued existence. Critical habitat is defined as areas of a listed species' habitats designated as essential to the conservation of that species. A federal action that "may affect" threatened or endangered species or their critical habitat requires Section 7 consultation with the US Fish and Wildlife Service (USFWS) under the ESA. Threatened or endangered species are defined as follows:

- Endangered species are those at risk for extinction in all or a large portion of their range.
- Threatened species are those likely to be listed as endangered in the near future.
- Proposed species are those for which the USFWS has received adequate petition information for listing as either threatened or endangered under the ESA. Section 7 compliance may become necessary as soon as a species is proposed for listing or a critical habitat is proposed for designation.
- Candidates are species for which the USFWS has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposal to list, but issuance of a proposed rule is currently precluded by higher-priority listing actions. The USFWS recommends that candidate species be treated as if they are listed because an emergency or a standard listing could occur during project planning and environmental analyses.

TES Species Definitions

- Species that are federally listed as threatened or endangered, and those that are proposed or are candidates for listing as such, in accordance with the Endangered Species Act
- Species listed by the Colorado Division of Wildlife as threatened, endangered, or as species of concern
- Species included on sensitive species lists developed by Region 2 of the USFS or by the BLM
- Species identified by the Colorado Natural Heritage Program as rare or endangered
- Selected management indicator species for the Arapaho and Roosevelt National Forests and White River National Forest

State Threatened, Endangered, or Species of Special Concern

The State of Colorado designates threatened and endangered animal species under State Statute 33-2-105. CDOW has developed two categories of imperilment for these animal species. The categories are:

- Threatened: species or subspecies not in immediate jeopardy of extinction but vulnerable because of small numbers, restricted ranges, or low recruitment or survival
- Endangered: species or subspecies whose prospects for survival or recruitment within the state are in jeopardy (CNHP 1999)

Species can also be listed as Species of Concern by CDOW. These include species that have been removed from state listing within the last five years, are proposed for federal listing or as candidates, or have experienced a downward trend in numbers or distribution in the state and warrant evaluation.

Supporting Documentation

- Appendix A, Environmental Analysis and Data

Public Lands Sensitive Species

USFS-listed sensitive species are plants and animals identified by regional foresters that have population viability concerns as indicated by: (1) significant current or predicted downward trends in population numbers or density; or (2) significant current or predicted downward trends in habitat capability that would affect the existing distribution of a species. BLM-listed sensitive species occur on public lands and have been designated by the State BLM Director as those that could easily become endangered or extinct in the state (CNHP 1999). The Corridor and the surrounding area of potential effect (APE) include lands managed by the USFS and the BLM. These agencies require that projects with a federal nexus, such as interstate highway construction, identify agency-listed sensitive species and ensure that the project does not cause species to decline and subsequently require listing under the ESA. A Biological Report (BR) that follows Forest Service Manual 2670 and Region 2 manual supplement 2600-94-2 for Biological Evaluations (BE) was prepared in conjunction with the PEIS and is provided in Appendix F, Biological Resources and Wetlands Documentation. The BR describes federal species listed under the ESA, USFS-sensitive and management indicator species of the WRNF and ARNF, and other important species and their habitats determined to occur within the Corridor, and evaluates potential impacts from the proposed alternatives for each. Plant species that are recognized by the USFS as having viability issues are also addressed in this section.

CNHP Ranked Species

CNHP has developed its own ranking system to focus attention on rare and endangered species in the state, including those that are not listed on federal or state protection lists. Specific ranking categories are listed below under appropriate tables.

Key habitat means any geographic area that is necessary for the maintenance or recovery of a threatened, endangered, or sensitive species. It addresses both the geographic distribution and the characteristics or quality of the environment.

Overview of Methods and Coordination

In accordance with Section 7 of the ESA, a list of TES species that could occur along the Corridor (that is, within Garfield, Eagle, Summit, Clear Creek, and Jefferson counties) was requested from the USFWS in October 2004. The USFWS responded with a letter listing potential species in the project area on November 4, 2004 (see Appendix F). USFS-sensitive species were identified from the lists provided by the Arapaho and Roosevelt (ARNF) and White River (WRNF) National Forests. BLM-sensitive, state-listed, and other special-status species were identified by contacting the BLM and CDOW and by using CNHP occurrence records.

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A committee was formed with members of USFWS, USFS, BLM, CDOW, FHWA, and CDOT to address the barrier effect issues of the Corridor. This committee, called A Landscape Level Inventory of Valued Ecosystem Components (ALIVE), focused on designating key wildlife and Canada lynx habitat, characterizing linkage interference zones, and recommending mitigation for wildlife crossings common to both key wildlife habitats and lynx habitats. The ALIVE committee and its recommendations are discussed in section 3.2, Biological Resources.

3.3.2 Affected Environment

The area of potential effect (APE) is the area of a plant or an animal's habitat that could be affected either directly or indirectly by the proposed alternatives. The likelihood of occurrence of each TES animal species initially listed as potentially occurring in the APE was determined by the presence of suitable habitat, known distribution records, and relative abundance. Numerous TES animal species were determined to be "unlikely to occur in the APE." These are listed in Appendix F, Biological Resources and Wetlands Documentation. Because no project-related effects to these species are anticipated, no further consideration of these species will be included in the PEIS unless new information warrants further analysis.

The likelihood for each TES plant species to occur in the APE was evaluated primarily on habitat affinities and habitat distribution. In general, records of rare plants exist only in areas where a study to find that plant has been conducted. Many areas have not been surveyed; therefore, habitat distribution must be used as the primary tool for determining the possible occurrences of plant species in unsurveyed areas. However, the chances of TES plants occurring near I-70 are limited. Typically, major highway rights-of-way are subject to large amounts of disturbance during construction and subsequent maintenance-related activities that reduce habitat suitability for these species. Most rare plant species are associated with undisturbed, mature seral stage habitats that possess unique features such as certain moisture regimes, soil types, elevations, or a combination of these. However, there are also TES plants that thrive in disturbed areas (such as moonworts). TES plant species determined to be "unlikely to occur in the APE" are listed in Appendix F, Biological Resources and Wetlands Documentation.

3.3.2.1 Species Descriptions

TES animal species that are known to occur or are likely to occur along the Corridor are listed in Table 3.3-1, alphabetized by scientific name within the major classes. The species' life history, habitat requirements, and distributional information, if known, are provided in narrative form in section 3.3.2.2. USFWS included the southwestern willow flycatcher and Mexican spotted owl on their list of species potentially occurring in the project area (USFWS 2004; see Appendix F). These two species are listed in Table 3.3-1, despite a lack of element occurrence in the project area. This is a conservative approach based on the potential for suitable habitat to occur in the APE. Under Tier 2 projects, surveys would be conducted for these two species to determine the potential for actual presence and for habitat suitability. The Uncompaghre fritillary butterfly was also listed by USFWS, but further research has documented that its habitat is restricted to alpine terrain above 12,000 feet with extensive snow willow patches. This habitat type occurs above the elevational upper limit of the Corridor (11,200 feet); therefore, this species is listed as not considered likely to occur in Table 3.3-1.

TES plant species likely to occur in the Corridor are listed in Table 3.3-2. Descriptions of the plants' ecological needs, habitat characteristics, and geographic range of species are provided in section 3.3.2.3. The Colorado butterfly plant and Penland alpine fen mustard are not listed in Table 3.3-2, despite USFWS identification of their potential occurrence in the project area. Element occurrence reporting for the Colorado butterfly plant shows that it is not found near the eastern terminus of the project area within the elevation range of the species (5,000–6,400 feet), nor is it found in systems

downstream of the South Platte River or in Platte River systems (Mayo 2004). The Penland alpine fen mustard is only known from high elevation (above 12,000 feet) on the eastern slopes of the Mosquito Range in Park County. Species that are listed as threatened or endangered, but were previously extirpated from Colorado, are not included in this analysis. These include species such as grizzly bear, bison, and gray wolf. Wolves have recently been introduced into Yellowstone Park, and migrants (as evidenced by a female wolf fatality in June 2004 on I-70 near Dumont) would be expected in Colorado.

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Table 3.3-1. TES Animal Species Known to Occur or Likely to Occur Within the APE

Scientific Name	Common Name	Status
Mammals		
<i>Euderma maculatum</i>	Spotted bat	FS, BLM, S2
<i>Gulo gulo</i>	North American wolverine	SE, FS, SVC, S1
<i>Lutra canadensis</i>	Northern river otter ▲	ST, FS
<i>Lynx canadensis</i>	Canada lynx	FT, SE, FS, SVC
<i>Martes americana</i>	American marten	FS
<i>Plecotus townsendii</i>	Townsend's big-eared bat	FS, BLM, SVC, S2
<i>Sorex hoyi</i>	Pygmy shrew	FS, S2
<i>Zapus hudsonius preblei</i>	Preble's meadow jumping mouse ▲	FT, ST, S1
Birds		
<i>Accipiter gentilis</i>	Northern goshawk	FS, BLM
<i>Aegolius funereus</i>	Boreal owl	FS
<i>Amphispiza belli</i>	Sage sparrow	FS, G5, S3B
<i>Centrocercus urophasianus</i>	Sage grouse	SC, BLM, SVC
<i>Charadrius melodus</i>	Piping plover ▲	FT, ST, S1B
<i>Circus cyaneus</i>	Northern harrier	FS
<i>Contopus cooperi</i>	Olive-sided flycatcher	FS
<i>Cypseloides niger</i>	Black swift	FS
<i>Empidonax traillii extimus</i>	Southwestern willow flycatcher	FE, G5
<i>Falco peregrinus anatum</i>	American peregrine falcon	SC, FS
<i>Grus americana</i>	Whooping crane ▲	FE, SE
<i>Haliaeetus leucocephalus</i>	Bald eagle	FT, ST
<i>Lagopus leucurus</i>	White-tailed ptarmigan	FS
<i>Numenius borealis</i>	Eskimo curlew	FE, GH
<i>Otus flammeolus</i>	Flammulated owl	FS
<i>Picoides tridactylus</i>	Three-toed woodpecker	FS
<i>Spizella breweri</i>	Brewer's sparrow	FS
<i>Sterna antillarum</i>	Interior least tern ▲	FE, SE
<i>Strix occidentalis lucida</i>	Mexican spotted owl	FT, G3, S1B
Amphibians and Reptiles		
<i>Bufo boreas boreas</i>	Boreal toad	FC, SE, FS, Management Indicator Species
<i>Liochlorophis vernalis</i>	Smooth green snake	G5, S4
<i>Rana pipiens</i>	Northern leopard frog ▲	SC, FS, BLM, SVC
Fish		
<i>Gila cypha</i>	Humpback chub ▲	FE, ST, S1
<i>Gila elegans</i>	Bonytail chub ▲	FE, SE
<i>Oncorhynchus clarki pleuriticus</i>	Colorado River cutthroat trout ▲	FS, BLM, SC, S3, Management Indicator Species
<i>Ptychocheilus lucius</i>	Colorado pikeminnow ▲	FE, ST, S1
<i>Oncorhynchus clarki stomais</i>	Greenback cutthroat trout ▲	FT, ST, S2, Management Indicator Species
<i>Scaphirhynchus albus</i>	Pallid sturgeon ▲	FE
<i>Xyrauchen texanus</i>	Razorback sucker ▲	FE, SE, S1

Scientific Name	Common Name	Status
Invertebrates		
<i>Celastrina humulus</i>	Hops feeding azure (butterfly)	G2, S2
<i>Cicindela nebraskana</i>	A tiger beetle (no common name)	G4, S2
<i>Doa ampla</i>	A moth (no common name)	G*, S1
<i>Erynnis martialis</i>	Mottled duskywing	G4, S2S3
<i>Grammia</i> sp 1	A tiger moth (no common name)	G*, S*
<i>Oeneis polixenes</i>	Polixenes arctic	G5, S2
<i>Polites origenes</i>	Crossline skipper	G5, S3

Sources: CNHP 2002, USFS 1999b; Kingery 1998, BLM 2001, Fitzgerald et al. 1994, USGS 2002.

Status:

FE = on federal endangered list
 FT = on federal threatened list
 FP = proposed for federal listing
 FC = federal candidate
 FS = USFS Region 2 sensitive
 USFS Management Indicator Species
 BLM = BLM sensitive
 SC = state species of concern
 SE = state endangered
 ST = state threatened
 SVC = WRNF species of viability concern (as of 2002)

S1 = (CNHP) Critically imperiled in the state due to rarity or biological factor making it vulnerable to extirpation
 S2 = (CNHP) Imperiled in the state due to rarity or factors that affect vulnerability to extirpation
 S3 = (CNHP) Vulnerable throughout the state
 When two S-numbers are given, species falls between them.
 S#B = (CNHP) Refers to breeding season imperilment
 G# = CNHP rankings that include the letter G are their status on a global level using a similar ranking as for state, GH = presumed eliminated
 * = Exact CNHP ranking of status undetermined
 ▲ = These species may be affected by impacts on stream systems, including depletions

Table 3.3-2. TES Plant Species That May Occur in the APE

Scientific Name	Species Common Name	Status	Habitat Association
<i>Aquilegia saximontana</i>	Rocky Mountain columbine	G3/S3, LVC	Subalpine to alpine cliffs, rocky slopes, 9,000–12,3000 feet
<i>Aralia nudicaulis</i>	Wild sarsaparilla	LVC	Moist to dry woodlands, thickets, riparian areas, prairie or bog edges, sand plains, rocky ridges, canyon sides
<i>Asplenium septentrionale</i>	Forked spleenwort	G4G5/S3S4, LVC	Cracks of rocks
<i>Astragalus argophyllus</i> var. <i>martinii</i>	Meadow milkvetch	S1	Sagebrush, piñon-juniper woodlands
<i>Astragalus leptaleus</i>	Park milkvetch	FS	Sedge-grass meadows, streams, 6,600–9,500 feet
<i>Astragalus molybdenus</i>	Leadville milkvetch	G3/S2, LVC	Rocky slopes, turf hillsides usually on limestones 11,400–13,2000 feet
<i>Botrichium echo</i>	Reflected moonwort	G3/S3LVC	Forests and meadows, often where historically disturbed
<i>Botrychium hesperium</i>	Western moonwort	G3/S2, LVC	Grassy meadows, snowfields, roadside ditches with willows, sand dunes, where historically disturbed
<i>Botrychium lanceolatum</i>	Triangle moonwort	G5/S3, LVC	Cool, moist woods, forest openings, often where historically disturbed
<i>Botrychium lineare</i>	Narrow-leaved moonwort	FS, FC, S1	Edges of streamside forests, grassy slopes, often where historically disturbed, 7,900–9,500 feet
<i>Botrychium lunaria</i>	Common moonwort	G5/S3, LVC	Mossy talus, ledges; rocky hillsides, forest openings, often where historically disturbed
<i>Botrychium minganense</i>	Mingan moonwort	G4/S1, LVC	Riparian zones, old-growth, dense shade, sparse understory duff, forest openings, often where historically disturbed

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Scientific Name	Species Common Name	Status	Habitat Association
<i>Botrychium multifidum</i>	Leathery moonwort	FS, S1	Mountain meadows, streamsides
<i>Botrychium pallidum</i>	Pale moonwort	G3/S2, LVC	Open hillsides, burned or cleared areas, often where historically disturbed, 9,800–10,600 feet
<i>Botrychium pinnatum</i>	Northwestern moonwort	G4?/S1, LVC	Riparian zones, forest openings, often where historically disturbed
<i>Botrychium simplex</i>	Least moonwort	G5/S1, LVC	Dry fields, marshes, bogs, swamps, roadside ditches, montane meadows
<i>Carex concinna</i>	Low northern or elegant sedge	BLM, G4G5/S1	Cool moist forests, peaty soils, 8,800–10,500 feet
<i>Carex diandra</i>	Lesser panicled sedge	FS, S1	Swamps, sphagnum bogs
<i>Carex leptalea</i>	Bristle-stalk sedge	FS, S1	Mineral-rich fens, wetlands, 9,000–10,000 feet
<i>Carex livida</i>	Livid sedge	FS, S1	Rich fens, wetlands, 9,000–10,000 feet
<i>Comarum palustre</i>	Purple cinquefoil	G5/S1S2, LVC	Bogs, meadows, stream banks
<i>Crataegus saligna</i>	Willow hawthorn	S2	Streams, canyons
<i>Cypripedium fasciculatum</i>	Purple lady's-slipper	G4/S3LVC	Lodgepole pine, spruce-fir forest, 8,000–10,500 feet
<i>Cypripedium parviflorum</i> or <i>C. calceolus</i> ssp. <i>parviflorum</i>	Yellow lady's-slipper	FS, S2	Aspen groves, ponderosa pine/Douglas-fir forests, 7,400–8,500 feet
<i>Cystopteris montana</i>	Brittlefern	G5/S1, LVC	Moist, wet woods and mossy mountain stream banks
<i>Drosera rotundifolia</i>	Roundleaf sundew	FS, S2	Floating peat mats, ponds, fens, 9,100–9,800 feet
<i>Eriogonum exifolium</i>	Dropleaf buckwheat	FS, S2	Barren hills and plains, sagebrush
<i>Eriophorum altaicum</i> var. <i>neogaeum</i>	Altai cotton-grass	FS, S3, SVC	High fens, 9,500–14,000 feet
<i>Eriophorum gracile</i>	Slender cotton-grass	FS, S2	Fens, wet meadows, pond edges, 8,100–12,000 feet
<i>Festuca hallii</i>	Hall's fescue	FS, SH	Dry alpine tundra grasslands, 11,000–12,000 feet
<i>Goodyera repens</i>	Dwarf rattlesnake-plantain	G5/S3S4, LVC	Mixed conifer stands, stream banks
<i>Kobresia simpliciuscula</i>	Simple kobresia	FS	Moist, gravelly tundra near Continental Divide
<i>Limnorchis ensifolia</i> or <i>Platanthera sparsiflora</i> var. <i>ensifolia</i>	Canyon bog-orchid	S3	Dry woods
<i>Listera borealis</i>	Northern twayblade	BLM, G4/S2, LVC	Moist, spruce forests, 8,700–10,800 feet
<i>Listera convallarioides</i>	Broadlipped twayblade	G5/S2, LVC	Wet moss, humus in moist forests
<i>Lomatogonium rotatum</i>	Marsh felwort	LVC	Wet meadows, ditches, saline-tolerant fen-like areas, willow carrs
<i>Lycopodium</i> species, any encountered	Club-moss	LVC	Cool forests; nutrient poor, moist soils
<i>Machaeranthera coloradensis</i>	Colorado tansy-aster	FS, S2, SVC	Gravelly areas of mountain parks to rock outcrops in dry tundra, 8,500–12,500 feet
<i>Mimulus gemmiparus</i>	Weber's monkeyflower	FS, S1	Granitic seeps, spruce-fir, aspen forests, 8,500–10,500 feet
<i>Parnassia kotzebuei</i>	Kotzebue's grass-of-Parnassus	FS, S2, SVC	Wet, rocky ledges, pond edges, 10,000–12,000 feet
<i>Penstemon harringtonii</i>	Harrington's beardtongue	BLM, FS, S3, SVC	Sagebrush, oak brush, rocky soils, 6,800–9,200 feet
<i>Petasites sagittatus</i>	Colt's foot	LVC	Fresh wet meadows; bogs, fens, swampy woodlands, disturbed sites
<i>Platanthera praeclara</i>	Western prairie fringed orchid ▲	FT	Tallgrass prairie, downstream
<i>Polypodium saximontanum</i>	Rocky Mountain polypody	LVC	Moist, shaded cracks, crevices in granite or sandstone outcrops, boulders

Scientific Name	Species Common Name	Status	Habitat Association
<i>Potentilla rupicola</i> or <i>P. effusa</i> var. <i>rupicola</i>	Front Range cinquefoil	FS, S2	Granitic outcrops and soils in ponderosa and limber pine forests, 6,900–10,500 feet
<i>Ptilogrostis porteri</i>	Porter feathergrass	BLM, FS, S2, SVC	Peat hummocks, fens, willow carrs, 9,200–12,000 feet
<i>Pyrola picta</i>	Pictureleaf wintergreen	G4G5/S3S4, LVC	Occurs over gold deposits, moist Douglas-fir and ponderosa pine forests
<i>Rubus arcticus</i> var. <i>acaulis</i> or <i>Cylactis arctica</i> ssp. <i>acaulis</i>	Dwarf raspberry	FS, S1	Boggy woodlands, marshes, willow thickets, streams, 8,600–9,700 feet
<i>Salix candida</i>	Hoary willow	BLM, FS, S2	Hummocks of fens, edges of ponds, river terraces, 8,800–10,600 feet
<i>Salix serissima</i>	Autumn willow	BLM, FS, S1	Marshes, fens, 7,800–9,300 feet
<i>Selaginella selaginoides</i>	Lesser club-moss	FS, SH	Marshes, pond edges, spruce forests
<i>Senecio bigelovii</i> or <i>Ligularia bigelovii</i>	Bigelow groundsel	LVC	Moist, grassy mountain hillsides, aspen forests
<i>Sphagnum</i> species, any encountered	Sphagnum	LVC	Saturated acidic bogs
<i>Spiranthes diluvialis</i>	Ute ladies'-tresses orchid ▲	FT, S2	Wet meadows, floodplains, 4,500–6,800 feet
<i>Sullivantia hapemanii</i> var. <i>purpusii</i>	Hanging garden sullivantia	G3/S3, LVC	Wet cliffs and boulders, hanging gardens, 7,000–10,000 feet
<i>Utricularia minor</i>	Lesser bladderpod	FS	Shallow subalpine ponds, fens, bogs
<i>Viola pedatifida</i>	Prairie violet	S2	Low elevation open woodlands, 5,800–8,800 feet
<i>Viola selkirkii</i>	Selkirk violet	FS, SH	Mountain forests, moist woods, 8,500–9,100 feet

▲ Locations at downstream sites; water depletion effects

Sources: Spackman et al. 1997; USFS 1999a; CNHP 2002

FT = Federally listed as threatened

FC = Federal candidate for listing

BLM = Listed as BLM sensitive

FS = Listed as Forest Service sensitive

SVC = WRNF species of viability concern (as of 2002)

LVC = ARNF and/or WRNF species of local viability concern

CNHP Rankings (as of October 2003)

S1 = Critically imperiled in the state due to rarity or biological factors making it vulnerable to extirpation

S2 = Imperiled in the state due to rarity or factors that affect vulnerability to extirpation

S3 = Vulnerable throughout the state

SH = Historically known but not verified recently

When two S- or G-numbers are given, species falls between them.

? = Unranked, awaiting formal rarity ranking

G-ranks, similar to S-ranks but for a global or range-wide level

3.3.2.2 TES Animal Species

Life history, habitat requirements, and distributional information for each TES wildlife species that is likely to occur within the Corridor or the APE are provided below. Habitat affinities for the animal species discussed in the following text are indicated in Table 3.3-3.

Mammals

Canada Lynx

The range of the lynx encompasses boreal (northern), sub-boreal, and western forests featuring cold, snowy winters (Ruggiero et al. 2000; Reudiger et al. 2000). Most of the range is located in central Canada and Alaska, which feature large areas of northern boreal forest. Lynx populations in the lower 48 are relatively small compared to those of central Canada and Alaska because of habitat patchiness (USFWS 2000b). Colorado is the southern limit of the North American distribution of the species,

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and the population is considered isolated from those in the Northern Rockies (Andrews 1992). Lynx in Colorado are principally associated with Engelmann spruce, subalpine fir, and lodgepole pine forests, although barren subalpine and riparian habitats are also used (Table 3.3-3). In Colorado, historically documented sightings and signs (tracks, scat, and hair) of native lynx were in eastern and southern Eagle County in the late 1970s and 1980s (Thompson and Halfpenny 1989). The lynx was listed in Colorado as endangered in 1973 and as a federally listed threatened species in 2000.

In an effort to re-establish lynx in Colorado, the CDOW released 166 lynx from 1999 to 2004 into suitable habitat areas of the San Juan Mountains in southwestern Colorado (CDOW 2004). Additional augmentations of 50 lynx are planned for 2005. As of August 2004, 56 lynx were known to have died, and 85 of the remaining animals were still being tracked by CDOW staff. Most lynx are still within the core area from New Mexico north to Gunnison, west to Taylor Mesa, and east to Monarch Pass. However, some have moved into Utah, Wyoming, and New Mexico (CDOW 2004). Released lynx have been recorded near the Corridor, north of I-70 (as far as Laramie, Wyoming), and animal-vehicle collisions (AVCs) have occurred on I-70 (Shenk 2001). A lynx was killed by a vehicle on I-70 west of Bakerville, near milepost 220, in 2000. Also, two lynx have been killed by vehicles on I-70 along Vail Pass, near milepost 188, one in 2002 and one in 2004. In the spring of 2004, a total of 30 kittens in 11 dens were confirmed and located throughout Colorado, with one in Wyoming.

No critical habitat for lynx has been designated by USFWS as of this time, but the ALIVE committee identified two quality habitat areas near the Corridor including large, relatively undisturbed blocks of spruce-fir and lodgepole pine forests in the WRNF in southern Eagle County and the Flat Tops Wilderness Area in northern Eagle County at elevations between approximately 8,000 and 12,000 feet. Preliminary data on the reintroduced lynx recorded their presence along the Corridor (mileposts 218 to 221) and in both the WRNF and ARNF. Maintaining connections between prime lynx habitat areas and access to other lynx for exchange of genetic material is critical for the continued survival of lynx in Colorado (Andrews 1992). The ALIVE committee identified Red Canyon west of Wolcott (milepost 153), upper west Vail Pass (milepost 188), Laskey Gulch (mileposts 207 to 209), and Herman Gulch (mileposts 218 to 221) as likely areas for lynx to cross the Corridor.

North American Wolverine

The North American wolverine occurs in the boreal forests and tundra of Canada and the northern US. The number of wolverine in Colorado is currently unknown, but population numbers were never high (Fitzgerald et al. 1994). Wolverines prefer lowland, marshy areas within spruce forests, preying on ungulates and other mammals. They tend to avoid areas with human activity. Therefore, threats to this species include increased human activity from recreational activities associated with trail use, ski areas and other resorts, and fragmentation caused by roads and development (WRNF 2002).

American Marten

The American marten occurs in boreal forests throughout North America. In Colorado, martens primarily inhabit subalpine spruce-fir and lodgepole pine and are usually associated with older and multi-aged stands with a high degree of forest floor structure. Habitat needs include high canopy closures, usually greater than 30 percent, and coarse woody debris and other forest floor objects such as rock piles, slash, and stumps that provide denning sites and access to prey. Various prey is consumed, but voles and mice constitute the majority (Fitzgerald et al. 1994).

Townsend's Big-Eared Bat

This medium-sized bat is a WRNF indicator of cave habitats but may also use cliff crevices, abandoned buildings, and mines for day roosts. Townsend's big-eared bat occurs in several Colorado counties along the western slopes of the Rocky Mountains. CNHP indicates two elemental

occurrences within 1 mile of the existing Corridor, one at milepost 123 in Glenwood Canyon, and one at milepost 235 east of Downieville. Three maternity roosts associated with Townsend's big-eared bat have been documented in the WRNF and also in the Glenwood Canyon area (WRNF 2002).

Spotted Bat

The spotted bat is considered one of the rarest of these mammals in the US, and its range is limited to the Great Basin area of western North America. Spotted bat habitat is associated with cliffs and canyons within ponderosa pine and piñon-juniper woodlands, as well as deserts. This bat is known to inhabit four areas of Colorado, including an area near Glenwood Canyon in the WRNF (WRNF 2000).

Pygmy Shrew

The pygmy shrew occurs in a wide variety of forest types, forest edges, and wet areas. In Colorado, the range of this species is restricted to elevations above 9,600 feet, primarily in the northern half of the state. Little is known about its natural history, but like other shrews, it eats a wide variety of insects and carrion and has a voracious appetite (Fitzgerald et al. 1994).

Northern River Otter

River otters associate with riparian habitats and once ranged from semidesert shrublands to montane and subalpine forests (NDIS 2004). After near extirpation, otters have been reintroduced to several areas of their historic range, including the Colorado, Gunnison, Piedra, and Dolores rivers in Colorado. USFS records report river otters in the Blue River, which flows across the Corridor near Dillon. Their food base of fish and crustaceans are maintained by high-quality perennial streams, usually with minimum water flows of 10 cubic feet per second.

Preble's Meadow Jumping Mouse

This small subspecies of jumping mouse occurs only along Colorado and Wyoming Front Range riparian areas that contain perennial streams and a dense understory of herbaceous cover, and usually including woody overstory. In the project Corridor, Jefferson County has been included in the Preble's mouse overall range by CDOW, and those areas along Clear Creek below 7,600 feet may contain suitable habitat. The species is known to occur in the eastern portion of the Corridor; an individual was trapped near the Beaver Brook interchange (milepost 248) in June 2004.

Birds

Bald Eagle

Bald eagles were listed as endangered under the ESA in 1978 but had recovered sufficiently by 1995 to be downlisted to threatened status. This species is also state-listed as threatened (Table 3.3-1). Because of its successful recovery, there is a current proposal to delist bald eagles from the ESA, but protections would remain under the Migratory Bird Treaty Act (MBTA), and the Bald Eagle Protection Act. The USFWS is also considering strengthening habitat protections under the Bald Eagle Protection Act (Ragan 2001). Based on CDOW data (2001), there are 51 known nesting pairs in Colorado, and approximately 1,000 bald eagles winter in the state. Bald eagles depend on large roost trees that allow them a wide field of vision for prey. Food sources include fish, small mammals, waterfowl, and carrion. Known sensitive habitats in the Corridor include winter range and roost trees in the Eagle River Valley primarily west of Eagle (BLM 2001). No known bald eagle nests occur in the Corridor APE.

American Peregrine Falcon

Peregrine falcons are considered species of special concern in Colorado, after rebounding from being federally and state-listed as an endangered species. This falcon prefers foothills and steep mountain

3.3 Threatened, Endangered, and Other Special Status Animal and Plant Species

cliffs for nest sites from 4,500 to more than 9,000 feet (USFS 1981). Peregrines hunt for small- to medium-sized birds often in river gorges. Colorado Western Slope populations, in particular, are stable and increasing (CDOW 2002a). The APE contains suitable habitat for peregrine falcons and known nest sites are present on Mount Royal south of Frisco, near Gilman south of Minturn, and in Glenwood Canyon.

Northern Goshawk

In Colorado, goshawks occur in mature stands of aspen, lodgepole pine, and spruce-fir forests at elevations of 7,500 to 11,000 feet. This species requires large blocks of forest for nesting and foraging and is often associated with small (less than 1 acre) openings. Opportunistic hunters, they prey on small mammals (such as squirrels and rabbits) and birds (Nature Serve 2001). They are uncommon residents in suitable foothill and montane habitats. In Colorado, nests are often placed in mature aspen stands. While no suitable nesting habitat is present within the Corridor, there are likely potential nesting areas within the APE, and goshawks are likely to use the Corridor for hunting.

Brewer's Sparrow

The Brewer's sparrow is a common summer resident throughout the mesas and foothills of Colorado and may occur locally in the lower mountains as well. Brewer's sparrow prefers sagebrush scrub habitats but will also use other types of shrubby cover types. They are most likely breeders in the far western portion of the Corridor, west of Avon (Andrews and Righter 1992).

Sage Sparrow

The sage sparrow is dependent on large blocks of sagebrush habitat. This vegetation type is limited to northwestern Colorado with occasional pockets found elsewhere. There is at least one record of a breeding sage sparrow pair for Eagle County, between Eagle and Gypsum (CNHP 2002, Kingery 1998).

Sage Grouse

The sage grouse is an upland bird species dependent on large, contiguous sagebrush habitats between elevations of 4,700 to 9,000 feet. In Colorado, the species is limited to the northwest corner of the state, with a few populations being recorded in Eagle County. The project Corridor is encompassed by general sage grouse habitat from approximately mileposts 133 to 160. Two breeding and two wintering areas occur south of I-70, within 1 to 3 miles of the Corridor. An additional breeding area is present to the north, about 5 miles from the Corridor (NDIS 2003).

Olive-Sided Flycatcher

The olive-sided flycatcher breeds primarily in mature spruce-fir and Douglas-fir forests, montane and foothill riparian zones, and aspen forests. Suitable habitat for this species is present in various locations throughout the APE, especially the Vail Pass area. This species is an uncommon breeder throughout the existing Corridor (Kingery 1998).

Black Swift

The black swift has a restricted range because it has a very narrow nest-site preference. It requires rocky shelves and outcrops on moist cliffs, often in forests, and usually behind active waterfalls. This type of habitat is relatively rare in Colorado. Nevertheless, it has been recorded within a mile of I-70 in Glenwood Canyon (milepost 126), at the bottom of west Vail Pass (mileposts 179 to 180), and west of Georgetown (milepost 227; CNHP 2002).

Boreal Owl

In Colorado, the boreal owl occurs primarily in mature coniferous forest stands at higher elevations, usually above 9,000 feet. It is a year-round resident and uses old woodpecker cavities as nest sites. Suitable habitat for this species is present in the Vail Pass area and around the Eisenhower-Johnson Memorial Tunnels (EJMT). This species is considered to be an uncommon breeder in both locations (Kingery 1998).

Three-Toed Woodpecker

The three-toed woodpecker is a rare year-round resident in spruce-fir forests, although it may be found in any coniferous forest type during insect outbreaks that kill large numbers of trees. Suitable habitat for this species may occur in various locations throughout the APE, especially at higher elevations, and the location may vary from year to year, based on the location of insect outbreaks. This species is considered to be an uncommon local breeder in the Corridor (Andrews and Righter 1992).

Whooping Crane

The whooping crane is an uncommon migrant through the San Luis and other western valleys, preferring mudflats around reservoirs and agricultural areas (Andrews and Righter 1992). These cranes nest in Canada and winter near the Texas coast. The main migration path for the cranes is to the east of Colorado, where they use the Platte River in Nebraska (Torres et al. 1978).

Eskimo Curlew

The Eskimo curlew was once an abundant shorebird, now perhaps extinct. There have been no reliable sightings since 1987. The species utilized grasslands, pastures, plowed fields, and marshes. It roosted on beaches along the coast. The species nested in open tundra and tidal marshes in the arctic. It fed on insects, seeds, and berries. The species is not listed in Colorado, but is still listed in the neighboring states of Kansas and Nebraska (Nature Serve 2004).

Interior Least Tern

The interior least tern is uncommon as a migrant and summer resident in southeastern Colorado and is found occasionally in other parts of the state. It is known to breed at several reservoirs in the Arkansas River Valley and is considered a casual nonbreeding summer visitor in the northeastern plains. Breeding birds nest on bare sandy shorelines of islands in reservoirs, and migrants occur at reservoirs, lakes, and rivers with bare sandy shorelines in the Platte River drainages in Nebraska. Nesting success varies year-to-year depending on water levels (Andrews and Righter 1992).

Piping Plover

The piping plover is a very rare migrant in eastern Colorado and breeds in the southeast part of the state and the Platte River system in Nebraska. It prefers mudflats and shorelines of reservoirs and lakes, and breeding birds are found on sandy, open shorelines with pebbles. The number of this species has declined sharply in North America due to development of their beach-nesting habitat. Numbers of piping plovers and nesting success vary greatly year-to-year due to water fluctuations that affect whether suitable habitat is available (Andrews and Righter 1992; Kingery 1998).

Northern Harrier

This raptor species inhabits (native and non-native) grasslands, shrublands, agricultural areas, and marshes, and is also observed on alpine tundra in the fall. Harriers prefer relatively open habitats characterized by tall, dense vegetation for nesting and foraging. Breeding harriers appear to be declining in the Central and Western regions, especially in the Southwest and Northern Plains subregions, most likely due to loss of grasslands and wetlands. Northern harriers occur throughout the

lower elevations of Colorado, usually near some source of water. Northern harrier presence in the Corridor is limited because they tend to be associated with lower elevation eastern and western counties in the state (Kingery 1998). They are known to have nested in wet meadows of the WRNF on the lower Flattops.

White-tailed Ptarmigan

The white-tailed ptarmigan is found exclusively in alpine tundra, especially in rocky areas with sparse vegetation. Summer habitats in the Rocky Mountains consistently include moist, low-growing alpine vegetation, and nests in rocky areas or sparsely vegetated, grassy slopes. Ptarmigans tend to search for vacant territory for natal areas and show a high fidelity to breeding territory in successive years (Andrews and Righter 1992, NatureServe 2004). Year-round Colorado residents of mountainous areas, these upland birds move from tundra several hundred feet lower down for the winter to feed on buds of willows. Lack of information makes it difficult to assess population size and trends, but reservoir and recreation development and overgrazing of willows by elk and livestock in the state are believed to have had an impact (Kingery 1998).

Mexican Spotted Owl

Region 6 USFWS (Mountain-Prairie Region) lists this species and/or its habitat as potentially occurring in Jefferson, Clear Creek, Garfield, and Summit counties. No element occurrence data were identified to support species occurrence in or near the APE; however, suitable habitat may exist. Mexican spotted owl habitat in Colorado is thought to consist of rocky canyons with mature, unevenly-aged, structurally complex stands of mixed conifer forest. Nesting is typically on cliff edges or in caves. Roosting takes place most commonly in Douglas-fir trees (NatureServe 2004).

Flammulated Owl

This cavity-nesting owl prefers open, often ponderosa pine forests for hunting insects and brush or dense foliage for roosting (Kingery 1998). Flammulated owls also have been known to use flicker cavities drilled in aspen for nesting. In Colorado, the migratory flammulated owls show strong preference for old-growth ponderosa pine and Douglas-fir, and sometimes aspen forests for nesting cavities, foraging, mating, and territorial calling. Loss and fragmentation of mature forest habitat suggest that populations may be declining. Data are not sufficient to track trends or model population dynamics, but in the northern Rockies, the few available data indicate population declines (NatureServe 2004).

Southwestern Willow Flycatcher

Region 6 USFWS (Mountain-Prairie Region) does not list this species and/or its habitat as potentially occurring in Jefferson, Clear Creek, Eagle, Garfield, or Summit counties. No element occurrence data were identified to support species presence in or near the APE; however, suitable habitat may exist. USFWS did list the southwestern willow flycatcher in their letter for species potentially occurring in the project area. Therefore, it is included here in an effort to remain conservative in evaluating affected environment. The southwestern willow flycatcher prefers habitat dominated by cottonwood-willow riparian communities near open water. They nest in dense vegetation of swampy thickets featuring willows or other dense vegetation.

Reptiles and Amphibians

Boreal Toad

Southern Rocky Mountain boreal toad populations have declined dramatically over the last 15 years. The boreal toad is a subspecies of the western toad that is geographically isolated and occurs in high-elevation forested habitat in several western states. Boreal toads breed in quiet shallow water in lakes, ponds, marshes, bogs, wet meadows, along streams, and even roadside ditches in elevations ranging

from 7,000 to 12,900 feet. Young toads seem to be restricted in movement and distribution by available moist habitat and tend to stay near where they hatch; adults, however, range widely, and may move miles from suitable breeding habitat. Boreal toads go into hibernation in refugia from September to mid-May.

During the late 1980s and the 1990s, boreal toad populations started to decline throughout Colorado. Reasons for these declines have not been clearly identified but may be attributed to new or more virulent strains of pathogens, the effects of toxins in water, acidification of water, habitat disturbance, or a combination of factors, leading to stress-induced immune system suppression (Loeffler 1999). Disturbances to habitats have resulted from logging, livestock grazing, pesticides, and/or possibly ozone depletion allowing increased ultraviolet radiation (Carey 2002). Any changes or effects to wetlands or ponds can negatively affect breeding habitat for boreal toads.

The Boreal Toad Conservation Plan and Agreement for the southern Rocky Mountains has an objective to recover the species to a secure level that will allow delisting in Colorado and New Mexico and avoid the need for federal listing. To delist this species, there must be at least two viable breeding populations in at least 9 of the 11 historic geographic areas (Loeffler 1999). In the APE, several sites have records of recent populations, but not all were subsequently relocated (for example Bethel slide, approximate milepost 217; Herman Gulch, approximate milepost 218). Other areas in the APE or adjacent areas are recognized by CDOW as boreal toad Potential Conservation Areas along North Tenmile, Upper Clear, Hoop, Meadow, and Upper Woods creeks primarily in Clear Creek and Summit counties, but CDOW does not reveal their precise locations because this species is sensitive to disturbance and illegal collection. CDOT has also identified Clear Creek near Watrous Gulch as a potential habitat site.

Northern Leopard Frog

Although once common, the northern leopard frog, like many amphibian species, is declining in numbers. In Colorado, the northern leopard frog occurs in various habitats near permanent water sources. Typical habitats include wet meadows and the bank of shallows of marshes, ponds, glacial kettle ponds, beaver ponds, lakes, reservoirs, streams, and irrigation ditches. Usually, leopard frogs are found at the water's edge, but they may roam far from permanent water in wet meadows or during mild wet weather (Hammerson 1999). Suitable northern leopard frog habitat occurs throughout the APE around ponds, lakes, and streams.

Smooth Green Snake

The smooth green snake prefers damp, grassy areas between streams, meadows and rocky areas (Stebbins 1966). Little is known about current distribution of this reptile within Colorado, but CNHP has at least one record of the snake in the vicinity of the APE; therefore, it could occur in other suitable habitats along the Corridor.

Fish

Many of the TES fish species occur at downstream locations from the Corridor and, therefore, have the potential to be affected by water depletions if water usage is required as part of the construction. The exceptions are the Colorado River cutthroat trout and greenback cutthroat trout, which occur in Corridor streams.

Colorado Pikeminnow

This big-river species uses low to medium gradient river reaches and pools as an adult, including deep, turbid waters. The young prefer small, quiet backwaters. Present distribution is drastically

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reduced from the original range, occurring only in Upper Colorado River basin, mainly in the Green River in Utah, and in the Yampa and Colorado rivers in Colorado and portions of Utah (NDIS 2003).

Razorback Sucker

This large-river species does not occur in small streams and headwaters. Historically found throughout the Colorado River drainage, the razorback sucker currently occurs only in the lower mainstem Colorado River, as well as the lower Gunnison and Yampa rivers. It occurs in backwaters, as well as areas with strong currents (NDIS 2003).

Bonytail Chub

Historically, this species has occurred throughout the Colorado River drainage. The bonytail chub currently has a limited distribution in Utah, and the last Colorado specimen was taken in 1984 from the Black Rocks area of the Colorado River, west of Grand Junction. Although little is known about the bonytail chub, it does prefer eddies and pools, rather than locations with swift currents (NDIS 2003).

Humpback Chub

This big-river fish occurs in river reaches with deep, swift, turbid water but chooses slower eddies and pools within these reaches. Historically, this species has ranged throughout the mainstem Colorado River basin, including the Yampa, Gunnison, and Green rivers. Currently, the humpback chub is most common in Colorado Black Rocks area, downstream of Grand Junction (NDIS 2003).

Pallid Sturgeon

Pallid sturgeon are an ancient species resembling prehistoric creatures, with long snouts and bony plates. They evolved as a bottom dweller in large, free-flowing rivers characterized by turbid water, braided channels, sandbars, and extensive backwater habitats. Pallid sturgeon once occurred throughout the Missouri River system, as well as the Mississippi River. They have suffered severe population declines due to changes in their river habitats and hydrology. This species occurs in the Platte River system, of which Clear Creek is part.

Greenback Cutthroat Trout

The greenback cutthroat trout is adapted to clear, cold, well-oxygenated streams that are devoid of introduced trout. Streams with moderate gradient, abundant riparian vegetation, and rocky to gravelly substrates are excellent trout habitat. The decline of pure populations of greenback trout was caused by massive introductions of non-native trout, which have contaminated the genetic strains of this species. Originally it inhabited the colder waters of the South Platte and Arkansas River drainages (Torres et al. 1978). Recent results from the cooperative program among the USFWS, USFS, and CDOW have shown that there are populations along the Corridor in Dry Gulch (milepost 217), a tributary of Clear Creek, and an area of Clear Creek at milepost 216, near where US 6 branches off toward Loveland Pass (Rosenlund 2004).

Colorado River Cutthroat Trout

This fish species is known only in the Colorado River drainage and requires running water with enough dissolved oxygen for spawning to be successful. This trout evolved from the rainbow trout and became separated geographically in mountainous areas over geologic time. This species is threatened by competition and hybridization with non-native fish, whirling disease, and development near streams that affects water quality. Information from the USFS (2000) indicated that, although core conservation populations do not occur in the Corridor, individuals have been recorded at locations near the Corridor in Berry Creek, Black Gore Creek, Gore Creek (Eagle River watershed), Polk Creek, Meadow Creek, and Dillon Reservoir. Other Colorado River cutthroat records within

1 mile of the Corridor occur at Miller Creek (Upper Gore Creek watershed), Booth Creek, and Pitkin Creek (Middle Gore Creek watershed).

Invertebrates

CNHP considers all of the TES invertebrates (butterflies, moths, tiger beetle) that may potentially occur within the APE as imperiled within the state to some degree (refer to Table 3.3-2 for specifics). All have been recorded in the APE vicinity in limited studies that have been conducted before 2002 (CNHP 2002). Habitat information, when known, for most rare insects includes grassland, meadow, and shrubby areas (refer to Table 3.3-3 for habitat information). In general, most invertebrates prefer undisturbed habitats that include several species of native grasses and forbs to use as food sources for adults and larva (USGS 2002).

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Table 3.3-3. TES Animal Species Known to Occur or Potentially Occur Within the APE by Vegetation-Habitat Type Preferences

Species	Ag	AM	Asp	Bar	BL	Dev	DF	GF	LP	MF	MS	PJ	PP	RF	RS	SR	SS	SF	WG
Mammals																			
Canada lynx				X					X						X			X	
North American wolverine		X																X	X
American marten		X		X					X						X			X	X
Northern river otter																X			
Townsend's big-eared bat				X								X	X	X				X	
Spotted bat				X								X	X		X			X	
Preble's meadow jumping mouse														X	X	X			X
Pygmy shrew		X					X											X	
Birds																			
Bald eagle							X							X					X
American peregrine falcon	X			X			X					X	X						X
Sage grouse																	X		
Olive-sided flycatcher			X				X							X				X	
Three-toed woodpecker																		X	
Boreal owl									X									X	
Mexican spotted owl							X			X									
Black swift			X				X							X		X		X	
Brewer's sparrow											X				X			X	
Sage sparrow															X				
Eskimo curlew	X							X								X			X
Whooping crane	X																X		X
Interior least tern																X			X
Piping plover																			X
Northern goshawk			X						X	X									X
Northern harrier								X							X	X			
Southwestern willow flycatcher														X	X				
White-tailed ptarmigan		X													X				
Flammulated owl			X				X			X			X						
Fish																			
Colorado pikeminnow																X			
Razorback sucker																X			
Bonytail chub																X			
Humpback chub																X			
Pallid sturgeon																X			
Greenback cutthroat trout																X			

Species	Ag	AM	Asp	Bar	BL	Dev	DF	GF	LP	MF	MS	PJ	PP	RF	RS	SR	SS	SF	WG
Colorado River cutthroat trout																X			
Amphibians and Reptiles																			
Boreal toad		X													X			X	X
Northern leopard frog		X												X	X				X
Smooth green snake		X						X						X	X				
Invertebrates																			
Hops feeding azure														X			X		
A tiger beetle ^a								X											
A moth ^a								X											
Mottled duskywing								X				X							
A tiger moth ^a																			
Polixenes arctic		X																	
Crossline skipper	X							X											
All aquatic invertebrates																X			X

Sources: Fitzgerald et al. 1994; Kingery 1998; Torres et al. 1978; USGS 2002; <http://www.platterriver.org/backgr/sturg.htm>.

Ag = Agricultural
 AM = Alpine Meadows-Krummholtz
 Asp = Aspen Forest
 Bar = Barren
 BL = Bristlecone-Limber Pine Forest
 Dev = Developed
 DF = Douglas-fir Forest
 GF = Grass-Forb Meadow
 LP = Lodgepole Pine Forest
 MF = Mixed Forest
 MS = Mountain Shrubland
 PJ = Piñon-Juniper Woodland
 PP = Ponderosa Pine Forest
 RF = Riparian Forest
 RS = Riparian Shrub
 SR = Streams, Rivers
 SS = Sagebrush Shrubland
 SF = Spruce-Fir Forest
 WG = Wetland General-Lakes, Ponds

^a No common names and no specific habitat information available at this time

3.3.2.3 TES Plant Species

Threatened and Endangered Plants

According to CNHP records (2002) and personal knowledge of USFS botanists, the following TES plant species occur within 1 mile of the Corridor or have suitable habitat within the area of influence, including downstream locations for water-dependent species. Thorough searches have not been conducted for TES plant species that may occur in the APE. If habitat is known within the APE that may support the species, the plant was considered as present until further information is gathered from specific project surveys during Tier 2 studies. Plant surveys will be conducted before individual project designs are finalized to avoid rare and sensitive plant species whenever possible.

Federally Listed or Candidate Plants

Narrow-leaved Moonwort

Moonworts are small, inconspicuous members of the fern family. This particular species is known to occur in only three Colorado counties. It prefers grassy slopes along the edges of forests with streams between 7,500 and 9,500 feet in elevation (Spackman et al. 1997). At least two populations are known to occur in Clear Creek County east of the EJMT (milepost 217) and along upper Clear Creek (mileposts 220 to 221).

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Western Prairie Fringed Orchid

The western prairie fringed orchid is federally listed as threatened and occurs in tallgrass prairie remnants that are moist and contain calcareous or subsaline soils, including sedge meadows. The species tolerates flooded conditions during 1 to 2 weeks per year (NatureServe 2004). It is pollinated only by hawkmoths and threatened by cropland conversion and development, as well as invasion and shading of habitat by trees, shrubs, and noxious weeds. This orchid remains as scattered occurrences in tallgrass prairie existing in states adjacent to Colorado (Nebraska and Kansas). Because of the possibility of downstream effects, this orchid is analyzed here for potential project impacts.

Ute Ladies'-tresses Orchid

The Ute ladies'-tresses orchid occurs primarily in three Colorado Front Range counties. Suitable habitat includes sub-irrigated soils along streams and open wet meadows in floodplains (Spackman et al. 1997). In the Corridor APE, this federally listed orchid has been recorded to occur in two locations of Jefferson County along Clear Creek — one population near Golden and another to the west of Golden, both are within 1 mile of the Corridor (CNHP 2002).

Forest Service Sensitive Plants

Park Milkvetch

This forb occurs in sedge-grass meadows, swales, and turf hummocks on the edge of meandering brooks; it is also present along streamside willows. Habitats range from 6,600 to 9,500 feet (Cunningham et al. 2003). Park milkvetch has been recorded in Summit County below Green Mountain Reservoir in the WRNF, north and upstream of the Corridor APE.

Leathery Moonwort

This moonwort is rare, but generally well distributed over range. It occurs in mountain meadows, fields, and open, grassy places. It prefers acidic, often sandy, soils.

Lesser Panicked Sedge

Lesser panicked sedge occurs in swamps, sphagnum bogs, lake margins, and wet, often calcareous meadows at moderate elevations. The species is circumboreal in distribution. In Colorado, this sedge occurs in willow carrs in subalpine areas (Weber and Wittmann 2001a). It has been documented on WRNF on the Garfield/Rio Blanco County line (outside Corridor APE).

Bristle-stalk sedge

The bristle-stalk sedge grows in mineral-rich fens and wetlands in elevations from 9,000 to 10,000 feet. Occurrence records for this sedge exist from montane wetlands east of the EJMT (mileposts 216 to 218) within 1 mile of the Corridor (CNHP 2002).

Livid Sedge

Livid sedge occurs in rich fens and grass-dominated mineral-rich wetlands between elevations of 9,000 and 10,000 feet (Spackman et al. 1997). This species has distribution across the northern states and Canada and south more sporadically through California. In Colorado, the livid sedge has been recorded in Jackson, Larimer, and Park counties, none of which is in the Corridor.

Yellow Lady's-slipper

This orchid species occurs in aspen groves and ponderosa pine/Douglas-fir forests at elevations from 7,400 to 8,500 feet (Spackman et al. 1997), primarily in the Front Range area, and in Colorado, the plant occurs in 16 counties. The largest populations occur in El Paso and Larimer counties, but scattered patches have been recorded in Clear Creek and Jefferson counties in the Corridor APE (CNPS 1997).

Roundleaf Sundew

Roundleaf sundew, a carnivorous plant, occurs on floating peat mats and on the margins of acidic ponds and fens (Spackman et al. 1997). Its distribution includes Eurasia, the northeast US, and several western states from elevations of 9,100 to 9,800 feet. In Colorado, the roundleaf sundew has been recorded in Gunnison and Jackson counties, but suitable habitat may exist in the Corridor in fens.

Dropleaf Buckwheat

Dropleaf buckwheat occurs on barren hills and plains to sagebrush flats and is an endemic of North and Middle Parks in Colorado (Weber and Wittman 2001a). Much habitat of this type occurs on the Western Slope of the Corridor and provides suitable habitat for the buckwheat.

Altai Cotton-grass

Altai cotton-grass, a grass-like forb, is also a WRNF Species of Viability Concern (SVC) and has been recorded in six counties in Colorado, including Eagle County (in the Corridor), and several locations on the WRNF (Cunningham et al. 2003). It is described as occurring in high fens of the Elk and San Juan Mountains in Colorado (Weber and Wittmann 2001a) usually at elevations of 9,500 to 14,000 feet.

Slender Cottongrass

This grass-like species occurs in fens, wet meadows, and on pond edges at elevations of 8,100 to 12,000 feet (Cunningham et al. 2003). The plant prefers calcareous soils and can form large uniform stands. The WRNF records distribution of this cotton-grass as only in Park County. CNHP includes Jackson and Las Animas counties, and Weber and Wittman (2001a, 2001b) lists the Elk and San Juan Mountains, none of which are in Corridor.

Hall's Fescue

This grass occurs in alpine tundra and dry subalpine grasslands at elevations of 11,000 to 12,000 feet. Its distribution includes the northern Rocky Mountains and Canada. Hall's fescue reaches its southern limit in Colorado and is known only in Larimer County as of 1997 (Spackman et al.). This population occurs in patches on mature soils of relatively dry, but peaty tundra (CNPS 1997). A historical population occurred in Park County in South Park but was never relocated.

Simple Kobresia

Simple kobresia prefers moist gravelly tundra near the Continental Divide of the Front Range area of Colorado (Weber and Wittman 2001b), a habitat that occurs above the EJMT.

Colorado Tansy-aster

Colorado tansy-aster occurs on gravelly areas in mountain parks, slopes, and rock outcrops to dry tundra of elevations from 8,500 to 12,000 feet (Spackman et al. 1997). Soils are usually made up of limey-sandstone or shaley-gypsum. The Colorado tansy-aster has been recorded in nine counties in Colorado, including Pitkin County on the WRNF.

Weber's Monkeyflower

Weber's monkeyflower prefers granitic seeps, slopes, and open sites in alluvium within spruce-fir and aspen forests at elevations from 8,500 to 10,500 feet. It is endemic to four counties in Colorado, including Jefferson (in Corridor) and Grand (just outside Corridor) (Spackman et al. 1997). Because surveys have not been widely conducted, this plant could occur within the Corridor.

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Kotzebue's Grass-of-Parnassus

This grass-like forb (also a SVC) occurs on subalpine and alpine wet, rocky ledges, moss mats, in sandy soil at the edges of lakes, ponds, and streams (Spackman et al. 1997). It prefers high-elevation conditions, occurring only from 10,000 to 12,000 feet. In Colorado, the Kotzebue's grass-of-Parnassus occurs in a few, scattered populations in several counties including Clear Creek in the Corridor APE. The WRNF has documented the species in Summit County, west of Hoosier Pass.

Front Range Cinquefoil

The Front Range cinquefoil is endemic to Clear Creek and three other counties in Colorado and grows on granitic outcrops or thin, gravelly granitic soils with western or northern exposure (Spackman et al. 1997). It can often be found in ponderosa or limber pine forests at elevations between 6,900 and 10,500 feet and has been recorded at milepost 232).

Porter Feathergrass

Porter feathergrass (also a SVC) prefers peat hummocks in fens and willow carrs between elevations of 9,200 and 12,000 feet in Colorado, where it is an endemic (Spackman et al. 1997). It occurs primarily in flat valleys exposed to the south and east (CNPS 1997). Porter feathergrass has been recorded in Summit County on the northwest side of South Park, and suitable fen habitat occurs in the Corridor.

Dwarf Raspberry

This small shrub prefers boggy woodlands and marshes at elevations of 7,000 to 9,000 feet (Wyoming Field Guide 1994). It also occurs in mossy willow thickets along mountain streams (Weber and Wittmann 2001a, 2001b). The plant tolerates a wide variety of soils from sandy to clay but requires moist conditions. Its range of distribution includes Alaska to Canada and Minnesota, and the Rocky Mountains from Montana to Colorado.

Autumn Willow

This shrub occurs in marshes or fens with other willow species and sedges between elevations of 7,800 and 9,300 feet (Spackman et al. 1997). Distribution includes Canada to New England to the northern Rocky Mountain states. In Colorado this willow is known from Larimer, Park, and Routt counties. Suitable habitat occurs in fens and fen-like areas of the Corridor near Vail Pass.

Lesser Club-moss

This fern-ally is a creeping plant that occurs in marshy places including the mossy banks of beaver ponds and in wet subalpine spruce forests (CNPS 1997). Its principal distribution is in Canada, but populations have been recorded in Wyoming and one in Colorado, a site that has not been relocated, but suitable habitat still exists along the Corridor.

Lesser Bladderpod

Lesser bladderpod occurs in and near subalpine ponds in several northern states and California, primarily on the Eastern Slope of Colorado, including the Boulder watershed. It is a perennial aquatic herb that prefers shallow waters and wet soil. Habitats include fens, open bogs, sedge meadows, and marshes; often in calcium-rich soils.

Selkirk Violet

The Selkirk violet is known to occur from British Columbia east to Greenland, and south into the US from Washington to New Mexico in cold mountain forests, moist woods, and thickets from 8,500 to 9,100 feet in elevation (Spackman et al. 1997). In Colorado, occurrence records exist for El Paso and

Larimer counties. Extensive surveys for this violet have not been conducted, and suitable habitat may exist in forested areas along the Corridor.

Hoary Willow

The hoary willow, also listed as USFS-sensitive, occurs on hummocks in nutrient-rich fens, in thickets at the edges of moderately high-elevation ponds and on river terraces from elevations of 8,800 to 10,600 feet (Spackman et al. 1997). Co-dominant plants include other willows and sedges, and distribution includes several northern states, Alaska, and Canada. Colorado is the known southern limit of this willow, and several counties have recorded the species, although none within the Corridor (Spackman et al. 1997). Suitable habitat in fens exists along the Corridor where the species may be found with intensive surveys.

Other USFS Species with Viability Concerns

Many species may occur in the project area that are of concern to USFS botanists that may not have enough information collected to date to warrant listing as USFS-sensitive, but that have viability issues and threats (in Table 3.3-2 as SVC and LVC). What is known about these species suggests that suitable habitat may occur along the Corridor; surveys will be required for these plants in conjunction with specific projects at the Tier 2 level. These plant species include:

- Bigelow groundsel
- Brittlefern
- Broadlipped twayblade
- Club-moss
- Colt's foot
- Common moonwort
- Dwarf rattlesnake-plantain
- Forked spleenwort
- Hanging garden sullivantia
- Leadville milkvetch
- Least moonwort
- Marsh felwort
- Mingan moonwort
- Northwestern moonwort
- Pale moonwort
- Pictureleaf wintergreen
- Purple cinquefoil
- Purple lady's-slipper
- Reflected moonwort
- Rocky Mountain columbine
- Rocky Mountain polypody
- Sphagnum
- Triangle moonwort
- Western moonwort
- Wild Sarsaparilla

The moonwort species occurs in similar habitats as the rarest narrow-leaved moonwort, a federal candidate for listing as threatened or endangered. Protection of these species with a viability issue is an objective of the USFS to prevent the need for listing as threatened or endangered.

BLM Sensitive Plants

Low Northern or Elegant Sedge

This sedge species grows in cool, moist forests in association with mosses on rich, peaty soils between 8,800 and 10,500 feet in elevation (Spackman et al. 1997). This species has been recorded in Clear Creek County within 1 mile of the Corridor east of the EJMT (milepost 218).

Northern Twayblade

Colorado is the southernmost region of the distribution for the northern twayblade. This orchid occurs in moist, spruce forests at elevations between 8,700 and 10,800 feet and has been recorded within

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1 mile of the Corridor in Eagle County on West Vail Pass (milepost 184), in Summit County near Frisco (milepost 200), and in Clear Creek County near Silver Plume (milepost 226).

Harrington Beardtongue

Harrington beardtongue, which is also listed as USFS-sensitive, grows in association with middle elevation (6,800 to 9,200 feet) sagebrush, oak brush, and other mountain shrub habitats including lower-elevation piñon-juniper woodlands, on level or slightly sloping sites, but can also occur on steep slopes. It prefers rocky loam and rocky clay loam soils derived from coarse calcareous parent materials (Spackman et al. 1997). This species can tolerate sparsely vegetated sites, exposed ridges, and disturbances such as livestock grazing and road cuts (USFS 1999a). Suitable habitat occurs on Colorado's Western Slope, including in Eagle County along the Corridor, and in the Eagle River valley, usually on BLM-managed and private lands (USFS 1999a). Harrington beardtongue has been recorded within 1 mile of the Corridor in several locations between Gypsum and Avon.

Rare, Imperiled, and Declining Plant Species

CNHP has developed a ranking system for plants to focus attention on rare, imperiled, or declining species in the state, including those that are not listed on federal or state protection lists. These ranking categories include S1, a plant that is critically imperiled in the state because of rarity or because of some factor of its biology making it especially vulnerable to extinction; S2, a plant imperiled within Colorado because of rarity or because of other factors that are affecting vulnerability to extinction throughout its range; or S3, a plant that is vulnerable throughout its range or found locally in a restricted range (CNHP 1999).

Four plant species identified within a 1-mile corridor on each side of I-70 throughout the Corridor area are categorized by CNHP in these three groups. They include:

- S1 plants
 - Meadow milkvetch
- S2 plants
 - Willow hawthorn
 - Prairie violet
- S3 plant
 - Canyon bog-orchid

Most of these rare plant species occur in specific habitat types. The meadow milkvetch occurs in sagebrush and piñon-juniper woodland habitats on the western end of the Corridor. The willow hawthorn is endemic only to the Gunnison River and upper Colorado River basins (Weber and Wittmann 2001). Prairie violet occurs in lower elevations (between 5,800 and 8,800 feet) in open woodlands, forest openings, and other prairie settings on rocky soils (Spackman et al. 1997). Records occur north of I-70 between milepost 256 and 260. Contrary to its common name, the canyon bog-orchid occurs in relatively dry woods (Weber and Wittmann 2001) and has been located south of Avon within several miles of the Corridor (CNHP 2002).

3.3.3 Environmental Consequences

This section discusses potential impacts on the TES species known to occur or that may occur along the Corridor, and that were identified and discussed in section 3.3.2. The TES species considered included federally and state listed species, USFS and BLM sensitive species, and CNHP designated species. Impacts on animal and plant species are discussed separately.

3.3.3.1 General Impact Types and Effects

Highway and transit-related impacts on TES animal species would be the same as those discussed for wildlife in general, in section 3.2, Biological Resources. However, the negative effects of some impacts, such as habitat fragmentation and roadkill mortality, would be magnified for species with small populations, which is characteristic of most TES species.

As addressed in the general wildlife section, three broad direct impact types were considered, consisting of habitat loss, the barrier effect of the alternatives, and the impact created by the road effect zone (REZ). The indirect effect of induced growth and the downstream effects are also considered. The potential for each of these impacts to affect different classes of species is discussed in detail below. Species are grouped differently, depending on the impact type being discussed. Summaries of the impacts on each TES animal species follow, and Table 3.3-4 identifies the most important impact on each species.

Direct Impacts

Habitat Loss

Loss of habitat would result in a loss of foraging, nesting, resting, or denning areas for threatened and endangered species. Loss of habitat could also result in lower prey densities, affecting all area carnivores, but especially threatened and endangered species.

For low-mobility species, even minor losses of habitat could have substantial negative impacts if that habitat is critical to their life cycle. Low-mobility TES species in the APE include the pygmy shrew, sage grouse, reptiles, amphibians, and invertebrates. Because they move slowly or are restricted to a certain type of habitat, it may not be possible for these species to access new habitat areas if their home ranges are affected. Fish are also considered in this category. Although some fish may be highly mobile within aquatic ecosystems, they cannot leave these habitats to escape a negative impact.

Barrier Effect

The barrier effect has the greatest impact on species that need to move freely between various habitats to fulfill their life-cycle requisites (Forman et al. 2003). The existing Corridor, as well as associated communities and adjacent roadways, currently constitute a major source of habitat fragmentation, disrupting wildlife movements through this area (USFS 2002). Impacts related to the barrier effect are discussed below by three broad groups of species: mobile species that must physically navigate the roadway to cross it (large mammals and forest carnivores), mobile species that can fly over the roadway to cross it (birds and bats), and low-mobility species (pygmy shrew and herpetiles) that are unlikely to attempt to cross the Corridor.

Large Mammals

Barrier effects from the Corridor that could potentially affect this group include direct mortality from colliding with vehicles, behavioral avoidance of the area from high levels of visual and noise disturbance, and the physical barrier created by project infrastructure and traffic. These impacts would be common to all alternatives, and impacts from the barrier effect on large mammals without additional crossing structures and wildlife fencing would be considered substantial (ALIVE Group Memoranda 2003). Alternatives that would increase the roadway surface and/or traffic volume would create greater opportunities for AVCs, and alternatives that would add safety barriers (such as "jersey barriers"), security-safety fencing, and/or elevationally split alignments would increase the likelihood that animals will become trapped on the pavement when they attempt to cross, or cannot cross at all.

Visual and noise disturbance is expected to increase from additional traffic volume and transit facility operations. Forest carnivores travel widely and may have little opportunity to acclimate to highway-related disturbance and, therefore, may avoid the Corridor altogether. All the alternatives would increase the physical barrier of the Corridor through the addition of roadway width (lanes), vertically split alignments, transit facilities, and/or safety barriers/security fencing or a combination thereof. The addition of below-grade crossing structures within the linkage interference zones identified by the ALIVE process would improve crossing opportunities in certain key locations (see section 3.2, Biological Resources, for a discussion of these linkage interference zones) and would prevent the Corridor from becoming a complete barrier to animal movement. Reports in the literature suggest that some local resident carnivores would learn to use crossing structures regularly (mountain lion, Beier and Loe 1992; Florida panther and bobcat, Foster and Humphrey 1995). However, estimating the efficacy of wildlife crossing structures to maintain habitat function and gene flow for wide-ranging mammal populations as a whole would be difficult because little research has been conducted on this topic (Barnum 2002, unpublished CDOT report).

Birds and Bats

Impacts on birds and bats from the barrier effect are generally expected to be negligible. Barrier effects from the Corridor that could potentially affect flyers would include direct mortality from colliding with vehicles, behavioral avoidance of the area due to high levels of disturbance, or behavioral avoidance of open areas. None of the species in question are known to be averse to flying across open spaces. Raptors are known to be sensitive to disturbance, but they would be capable of flying well above the Corridor if necessary. The potential for direct mortality to affect flyers would depend on their in-flight behavior. While most of the species in this group tend to fly well above the ground when traveling from place to place, sage grouse, Brewer's sparrow, and sage sparrow all tend to fly in short bursts, low to the ground. Therefore, these species would have a greater potential to suffer direct mortality from collisions with vehicles. Construction activity would have the potential to affect peregrine falcons; however, the nearest nest site is next to Frisco, but in close proximity to a high-density, developed area. Therefore, impacts from implementation of alternatives would be within the context of a highly active urban area.

Low-Mobility Species

Low-mobility species consists of the reptiles, amphibians, and pygmy shrew. Barrier effects from the Corridor that could potentially affect these species include the physical barrier created by project infrastructure and traffic, and direct mortality from colliding with vehicles. The current configuration of the highway probably already presents a complete barrier to these species, creating essentially separate populations on either side of the highway. Increasing the barrier effect of the highway would probably not add any new impacts on this species. Local individuals that live next to underpass structures may use these structures to cross, potentially allowing for some gene flow between populations. Because of their low mobility, vehicles would probably be a small mortality source for all these species except possibly the boreal toad. Although they move slowly, boreal toads are known to range widely into upland habitats after the breeding season and could reasonably be expected to occur on the road surface.

Indirect Impacts

Road Effect Zone

The REZ (Forman and Alexander 1998) is the area into which various effects generated by roadway operations penetrate. These effects include disturbance such as noise and visual stimuli, as well as physical impacts such as sediment and contaminated runoff from the roadway's surface, and introduction of noxious weeds into habitats. Species vary in their reaction to disturbances, and the

distances that disturbances extend into adjacent areas also vary depending on topography and vegetation.

Disturbance Effects

No research regarding the impact of REZ-related disturbance on TES species likely to occur in the Corridor has been conducted. However, studies of other species indicate that day-to-day road operations can cause permanent disturbance effects on wildlife. Research (van der Zande et al. 1980, Reijnen et al. 1995, Reijnen et al. 1996) indicates that breeding bird densities are reduced near roads, with the effect being greater for heavy traffic and reaching farther in open habitats (up to 6,500 feet) as compared with forested habitats (up to 5,000 feet). In Colorado, both mule deer and elk were shown to avoid areas within 650 feet of a road, with this effect appearing stronger in shrub cover types, as compared with forested habitats (Rost and Baily 1979). Studies also indicate that various carnivores, including grizzly bears (McLellan and Shackleton 1988), wolves (Thiel 1985, Mech et al. 1988), and bobcats (Lovallo and Anderson 1996) avoid habitats adjacent to roads. Alternatives that would create increased highway capacity would increase both noise and visual stimuli as traffic volumes increase. The Transit alternatives would also increase disturbance, especially if trains, AGS, or buses run intermittently because animals are less likely to habituate to unpredictable visual and noise disturbances.

Runoff

Highways are widely documented to have substantial impacts on water quality due to inputs of sediment, heavy metals, salts, and nutrients associated with road systems. In winter, deicing compounds and traction materials are major contributors of these chemical inputs, while pollutants created by vehicle operations contribute year-round (Trombulak and Frissell 2000). In addition to inundating downstream habitats and affecting plants and animals directly, changes in hydrological regime and water quality can cause secondary impacts by changing plant dispersal and survival over time, leading to shifts in plant communities and habitats (Findlay and Bourdages 2000). Species dependent on wetlands, riparian zones, and aquatic habitats—including reptiles, amphibians, and fish—are susceptible to both the primary and secondary impacts of contaminated roadway runoff.

Induced Growth

Based on long-range planning, development in the counties surrounding the Corridor is expected to increase. Upgrading the access that I-70 provides to Clear Creek, Summit, and Eagle counties is anticipated to accelerate this growth (as discussed in section 3.10, Land Use). Increasing the amount of development in the Corridor is likely to negatively affect habitat availability, quality, and connectivity for all species. Both development and recreational use are projected to increase regardless of whether action alternatives are implemented or not (No Action alternative). Transit alternatives would likely induce growth in existing urban centers. Alternatives that expand highway capacity would likely induce additional development in rural areas and dispersed recreation.

Currently, most development in the APE is concentrated near the existing network of highways, magnifying their barrier effect, and fragmenting habitats into smaller parcels defined by the development and associated highway-road networks. The development has centered on many of the valleys and primarily has affected TES species habitat connectivity.

Western Eagle County and eastern Clear Creek County contain a substantial amount of privately held land that is platted for low-density development. The impact of induced growth in these two areas could increase fragmentation or cause loss of habitat, depending on the alternative chosen. Transit alternatives would more likely promote growth in the existing developed area that they would serve. Alternatives that increase traffic volumes would more likely promote development in rural areas, as more people would be able to easily drive their personal vehicles to the area. Increased influx of

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people into these areas would likely increase recreation in public areas and displace TES species (such as forest carnivores) from some habitats.

Downstream Water Depletion

All water depletions from the upper Colorado River basin “may affect” five Colorado River watershed TES fish species: the Colorado pikeminnow, razorback sucker, humpback chub, bonytail chub, and Colorado River cutthroat trout. Therefore, Section 7 consultation is required for all federal actions that cause or authorize a water depletion to the basin. The 1999 *Colorado River Programmatic Biological Opinion* addresses water depletions in the Colorado River and its tributaries above its confluence with the Gunnison River. Recovery actions outlined in the *Programmatic Biological Opinion* provide measures to avoid the likelihood of jeopardy and adverse modification of critical habitat. To offset the cost of implementing recovery actions, a one-time fee is required for new depletions greater than 100 acre-feet/year (the fee for 2004 is \$15.93/acre-foot). Other provisions of the *Programmatic Biological Opinion* are that nonfederal water users are required to sign a Recovery Agreement and federal agencies are requested to retain discretionary authority in the event that consultation is reinitiated. There is no fee for historic depletions (prior to 1988) or depletions less than 100 acre-feet/year. So long as sufficient progress is being made toward achievement of program objectives, no additional mitigation obligations are imposed.

According to the USFWS, any depletion to the Platte River basin (roughly defined as the Palmer Divide north and the Continental Divide east in Colorado) constitutes an action that may affect, and is likely to adversely affect, TES species that depend on the river for their existence.

TES species downstream along the central and lower Platte River and Missouri River include the whooping crane, Eskimo curlew, interior population of the least tern, piping plover, bald eagle, western prairie fringed orchid, and pallid sturgeon. Additionally, various recovery teams have agreed that depletions to the Platte River system that are greater than 25 acre-feet/year are likely to jeopardize the continued existence of these species. If a project with a federal nexus will consume more than 25 acre-feet/year, the reasonable and prudent alternative provided by the USFWS will include one or more of the following, depending on whether there are new and/or historic water depletions: (a) replace the water on a 1:1 basis; (b) improve or create habitat in essential areas; (c) pay an annual fee that will allow the USFWS and their partners to acquire water and improve or create habitat for these species until such time as a satisfactory three-state cooperative program between Nebraska, Wyoming, and Colorado is in place for their recovery. For depletions less than or equal to 25 acre-feet/year, a one-time fee will be assessed as an interim measure. Once the three-state cooperative recovery program is in place (now estimated to be 2005), ESA compliance for all historic and most/all new water depletions will be provided by the program. In Colorado, other listed species potentially affected by depletions include those that are dependent on riparian systems near the Corridor such as the threatened Preble’s meadow jumping mouse, Ute ladies’-tresses orchid, and the Colorado butterfly plant.

Any project-related depletions to the Colorado or Platte River systems that have not been previously consulted on by the USFWS will be addressed when individual quantities of water uses for specific projects are known during Tier 2 and analysis required for NEPA documentation.

3.3.3.2 Impacts on TES Animal Species

As stated in the introduction to this section, at this Tier 1 level of analysis, surveys of most TES species habitats were not available; therefore, the quantification of the impacts was not completed for TES species habitats. TES surveys will be conducted as appropriate at the Tier 2 level of analysis.

The discussion below addresses the potential for individual species to be affected by project alternatives based on currently available data.

Resource mapping was conducted for certain TES species habitats: boreal toad habitat, Colorado River and greenback cutthroat trout habitat, as well as lynx linkage areas. Specific acreages of potential impacts can, therefore, be identified for these habitats and linkage areas. For all other species, qualitative discussions of potential affect are provided.

Each species name listed below is followed by abbreviations specifying its TES status according to federal and state agencies. Varying levels of protection are afforded to each species depending on its respective status. Refer to the footnote to Table 3.3-1 for full status names.

Mammals

Canada Lynx (FT, SE, FS, SVC)

The I-70 Corridor traverses through important lynx habitat, especially along Vail Pass; many areas above 8,000 feet along the Corridor are considered lynx habitat, which could be affected by the implementation of project alternatives.

However, the primary source of negative effects to lynx would be increasing the I-70 barrier effect either from the physical presence of Highway and Transit alternatives or from noise and visual disturbance, as discussed earlier (Table 3.3-4). The extent to which lynx will approach and cross under a busy highway is unpredictable, depending on numerous circumstances at the crossing structure, such as noise, as well as individual animal characteristics (Beier and Loe 1992; Forman et al. 2003). Combination Highway/Transit alternatives would pose the most potential to increase barrier effect because of the additional lanes and structures on the roadway surface. AGS, which would be a completely elevated system, would present somewhat less of an impediment than other alternatives that contain on-grade facilities.

Lynx linkage areas are areas of movement opportunities. They exist on the landscape and can be maintained or lost by management activities or developments. They are not “corridors” which imply only travel routes; they are broad areas of habitat where animals can find food, shelter and security.

The Canada Lynx Conservation Assessment Strategy (LCAS) defines linkage areas as:

“Habitat that provides landscape connectivity between blocks of habitat. Linkage areas occur both within and between geographic areas, where blocks of lynx habitat are separated by intervening areas of non-habitat such as basins, valleys, agricultural lands, or where lynx habitat naturally narrows between blocks. Connectivity provided by linkage areas can be degraded or severed by human infrastructure such as high-use highways, subdivisions or other developments. (LCAS revised definition, Oct. 2001).

The identification and mapping of potential lynx linkage areas and connective shrubsteppe habitats for lynx in Colorado and Wyoming was agreed to in the Conservation Agreement (#00-MU-11015600-013, 2/07/2000), between the USFS and USFWS, and by the BLM under a different Conservation Agreement. This mapping effort was initiated in January 2002, by an interagency team, and further refined at the local level by including consideration of local information and conditions.

The interagency team consisted of representatives from USFS, BLM, USFWS, US Park Service, CDOW, FHWA, CDOT, and the Colorado State Forest Service. The National Lynx and Wolverine Interagency Steering Committee reviewed them in October 2002.

Lynx linkage areas are shown on Map 3.3-1 in the Resource Maps section. Those linkage areas that fall in the I-70 Corridor were assessed for potential disturbance by alternatives, and the resulting data are available on the Impact Data Table in Appendix A, Environmental Analysis and Data. Potential impacts on lynx linkage areas from project alternatives, including the alternative footprint, construction disturbance zone, and sensitivity zone, would range from 118.0 acres (Minimal Action) to 426.9 acres (Combination Six-Lane Highway with Rail and IMC).

Minimal Action, Bus in Guideway, and Highway alternatives would have among the least impacts on lynx linkage areas relative to other alternatives. The Combination Six-Lane Highway with Bus in Guideway alternatives and Rail with IMC alternative would result in intermediate impacts on these areas. The greatest impacts on lynx linkage areas would result from the Combination Six-Lane Highway with AGS and Combination Six-Lane Highway with Rail and IMC alternatives.

Impacts may be mitigated by wildlife crossing structures that are planned as part of the alternatives, which would improve connectivity in lynx linkage areas (for example, in linkage interference zones 3, 6b, 7, 9a, and 10; see section 3.2, Biological Resources, for descriptions and a discussion of these zones. Linkage interference zones are not the same as, but may overlap, lynx linkage areas).

Induced growth in the area would also lead to an increase in uses of areas during winter, resulting in expansion of ski areas, snowshoeing, and snowmobile use, all of which compact snow and increase the frequency of human presence. Increased snow compaction provides other carnivores (coyotes, mountain lions) an advantage over lynx for winter foraging. REZ-related disturbance and habitat fragmentation due to induced growth would also likely affect lynx. These impacts could potentially have population-wide effects, as well as affect individuals.

Indirect impacts would be expected to increase with the No Action alternative from increased traffic volumes and growth already occurring, and from the lack of opportunities to install additional crossing structures in linkage interference zones that arise with other alternatives (see section 3.2, Biological Resources, for a discussion of linkage interference zones).

North American Wolverine (SE, FS, SVC, S1)

Little to no rare or key wolverine habitat would be affected by any of the alternatives. In general, key habitats for wolverine include mature forest stands and/or secluded areas. In general, preferred habitat for wolverine includes tundra, high-elevation marshy areas and especially high-elevation forest stands. Potential effects from the Minimal Action auxiliary lane component in this area would be similar to that noted for lynx. The primary source of negative alternative-related effects for wolverine would be from the barrier effect of the highway (Table 3.3-4). REZ-related disturbance and habitat fragmentation from induced growth also would affect wolverine. Alternative-specific impacts on wolverine would essentially be the same as those discussed for lynx because of their similar habits. Wolverine would also be sensitive to impacts occurring in lynx linkage areas because these zones represent connections between large blocks of undeveloped forest habitat, which is important to both species. These impacts could potentially have population-wide effects, as well as affect individuals.

American Marten (FS)

Impacts on marten from the alternatives would be similar to those noted for lynx and wolverine. REZ-related disturbance and habitat fragmentation caused by induced growth would also affect this species. Marten would likely be sensitive to impacts occurring in lynx linkage areas because these zones often represent connections between large blocks of undeveloped forest habitat, which is important to both species. Impacts could potentially have population-wide effects, as well as affecting individuals.

Townsend's Big Eared Bat (BLM, FS, SVC, S2)

The loss of a small amount of general habitat would be unlikely to affect this species. Within the Corridor, numerous areas of rocky cliffs and outcropping could potentially serve as roost sites, especially in Clear Creek County. The loss of day, maternity, or hibernation roosts from construction would constitute a serious impact because these resources are rare. However, there are no known roosts within the Corridor (ARNF 1997; CNHP 2002), but a closer analysis of the habitat and/or a roost survey by a bat expert would be required to estimate the potential for impacts on these resources. Loss of natural habitat from increased growth could be offset by man-made habitat because this species is known to roost in man-made structures and could benefit from water sources created by landscaping ponds (such as on golf courses).

Spotted Bat (BLM, FS, S2)

For this species, the loss of general habitat from the alternatives is not expected, and as indicated for Townsend's big-eared bat, numerous areas along the Corridor could serve as roost sites. However, there are no known roosts within the Corridor (ARNF 1997; CNHP 2002), and a closer analysis of the habitat and/or a roost survey by a bat expert would be required to determine the potential for impacts on these resources on a project-specific basis.

Pygmy Shrew (FS, S2)

This species appears to occur only in forested habitats at elevations above 9,600 feet in Colorado. Alternatives that would consume habitat above that elevation would likely displace some individuals. Therefore, construction of alternatives on either side of the EJMT and on Vail Pass could affect habitat of this species. However, because little is known about the distribution of pygmy shrews in Colorado (Fitzgerald et al. 1994), it is difficult to estimate the impact of habitat loss at population levels. REZ-related impacts such as noise and the barrier effect of the highway would not appreciably affect this species, and most induced development should occur below 9,600 feet in elevation. Road effects that include runoff contamination could affect some downgradient forest habitats.

Northern River Otter (ST, FS)

The known otter populations in the Colorado River and Blue River have the potential to be affected by downstream project effects. The Combination Six-Lane Highway with Rail and IMC and Combination Six-Lane Highway with AGS alternatives would have the most direct impact on streams and riparian areas from construction footprint and support activities. Increased inputs of contaminated runoff, sedimentation, and winter maintenance substances into aquatic habitats may have a negative impact on all water-dependent species in downstream habitats. Induced growth that affects wetlands and aquatic habitats may also potentially degrade these habitats.

Preble's Meadow Jumping Mouse (PMJM) (FT, ST, S1)

Habitat for the PMJM includes dense vegetation of riparian areas along running streams in the Front Range of Colorado and Wyoming. Because this mouse species inhabits areas of Jefferson County and suitable habitat and an individual was found near the Beaver Brook interchange of I-70 (approximate mileposts 247.5 to 248.0; Michael 2004), there would be the potential to affect either individuals or suitable habitat. Impacts to wetlands and other riparian areas would be minimized as much as possible, but temporary downstream effects that would affect PMJM habitat may occur.

Birds

Bald Eagle (FT, ST)

The primary impact source for this species would be REZ-related, including construction disturbances and habitat loss due to induced growth. Loss of roost trees or primary foraging areas due to induced growth may potentially have population-level effects. There are documented roosts and winter range

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in the Eagle River Valley, and these areas could be negatively affected by additional development that is platted in this portion of the APE. An increase in human impacts in the area could lead to a decrease in aquatic habitat quality and, in turn, a decline in fish and waterfowl that bald eagles use as prey.

American Peregrine Falcon (SC, FS)

The primary impact source for this species would be REZ-related and construction disturbance to foraging habitats. Induced growth and development may also affect historic nest sites south of Minturn and Frisco. Because these falcons hunt for miles around nest sites, additional noise and human presence may reduce foraging in the Corridor area and have population-level effects. Project construction disturbances would not directly affect nest sites because of their distance from the Corridor, although loud construction noise (for example, blasting) could temporarily reduce their use of the Corridor as a hunting area.

Northern Goshawk (FS, BLM)

Existing databases (CNHP 2002; ARNF 1997) indicate that there are no known nest sites for goshawks in the Corridor. Therefore, the loss of forest habitats adjacent to the current highway from project construction would not be expected to adversely affect this species. The primary impact source for this species would be REZ-related disturbance and loss of nesting or foraging habitat due to induced growth, which may potentially have population level effects.

Sage Grouse (SC, BLM, SVC)

Habitat loss due to construction and induced development would be the effects most likely to affect this species, although there is no known key grouse habitat within the proposed construction footprints (NDIS 2003). Highway and Combination alternatives would cause the most losses to sagebrush habitat. Additionally, I-70 may act as a barrier to sage grouse, as this species is not a strong flyer, and grouse habitat occurs on both sides of the highway between Eagle (milepost 147) and Avon (milepost 167). Loss of key habitat, substantial losses of general habitat, and the inability to move freely between habitat areas, which could occur as development continues in Eagle County, could potentially have population-wide effects on this species.

Olive-Sided Flycatcher (FS)

Forest and riparian habitat loss, either directly or from induced growth, and an increase in REZ-related disturbance would be the effects most likely to affect this species. Because of the large amount of habitat available in the APE, however, these impacts are expected to be relatively small. Although some individuals may be displaced, population-wide effects would be unlikely.

Three-Toed Woodpecker (FS)

Spruce-fir habitat loss, either directly or due to induced growth, and an increase in REZ-related disturbance would be the effects most likely to affect this species. Because of the large amount of habitat available in the APE, however, these impacts are expected to be relatively small. Although some individuals may be displaced, population-wide effects would be unlikely.

Boreal Owl (FS)

Lodgepole pine and spruce-fir habitat losses, either directly or from induced growth, and an increase in REZ-related disturbance would be the effects most likely to affect this species. Because of the large amount of habitat available in the APE, however, these impacts are expected to be relatively small. Although some individuals may be displaced, population-wide effects are unlikely.

Black Swift (FS)

The primary impact source for this species would be the potential loss of rare habitats (nest sites) due to construction and/or induced growth, especially in aspen, Douglas-fir, riparian forest, and spruce-fir habitats. However, no nest sites, the loss of which could affect this population, are known to occur adjacent to the I-70 right-of-way.

Brewer's Sparrow (FS)

Mountain shrubland, riparian forest, and shrub habitat losses from construction and induced development would be the effects most likely to affect this species. Additionally, I-70 may act as a barrier to Brewer's sparrow because this species tends to fly low to the ground, and there is sagebrush habitat on both sides of the highway in areas between Eagle and Avon. Substantial losses of sagebrush habitat and the inability of this species to move freely between habitat areas could potentially have population-wide and individual impacts on this species.

Sage Sparrow (FS)

Sagebrush and riparian shrub habitat losses from construction and induced development would be the effects most likely to affect this species (Table 3.3-4). Additionally, I-70 may act as a barrier affecting sage sparrows in a manner similar to the impacts identified for Brewer's sparrow.

Whooping Crane (FE, SE), Eskimo Curlew (FE), Interior Least Tern (FE, SE), Piping Plover (FT, ST, S1B)

These bird species would be affected if there are water depletion or water quality changes that affect downstream locations along the Platte River into Nebraska. The effects of road construction would depend on the particular requirements of each construction project for portions of the Corridor and will be considered in the Tier 2 studies. These bird species occur primarily in the larger, slower moving reaches of the Platte River and in other areas on the eastern plains. Therefore, impacts would be associated with instream flow reductions and influx of material that would affect water quality. Any depletion to the Platte River basin would need to be mitigated according to USFWS requirements. As areas develop along the Corridor, the potential for water quality to be affected by increased runoff from paved surfaces, disturbed construction sites, and landscaping chemicals (such as used on golf courses, residential and commercial areas) becomes greater.

Northern Harrier (FS)

Northern harrier presence in the Corridor is limited because they tend to be associated with lower elevation eastern and western counties in the state (Kingery 1998). This hawk has been recorded to nest in wet meadows of the WRNF on the lower Flattops. Project impacts may be limited to downstream effects from increased contaminant and sediment runoff and if water depletions occur to the drainages that these raptors use.

White-Tailed Ptarmigan (FS)

The proposed action is expected to have little impact on this species, as it would affect only a very small amount of habitat at treeline. Because of the large amount of habitat available in the state, these impacts are expected to be negligible. Additionally, ptarmigan habitat is primarily located on federally protected lands, which reduces the potential for induced development. Improved highway access may contribute to increased levels of dispersed recreational activity, however, which could potentially disturb some nesting birds.

Mexican Spotted Owl

As described in the Affected Environment section for this species, there is no element occurrence data for this species in the project area. Further survey work would need to be undertaken to determine whether suitable habitat may be affected by the project. Impacts on habitat would result from

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destruction of rocky cliff faces or cave locations in mature mixed conifer forest. Other effects may include habitat avoidance due to construction noise. Douglas-fir trees are the preferred roost trees in Colorado, and their locations within the APE would also need to be considered. Direct impacts on Douglas-fir forests from alternative footprints were estimated to range from two (numerous alternatives) to six (Six-Lane Highway 65 mph) acres.

Flammulated Owl (FS)

Habitat loss, either directly or due to induced growth, and an increase in REZ-related disturbance would be the effects most likely to affect this species. Because old-growth habitat would be unlikely to be directly affected in the APE, these impacts are expected to be minor. Although some individuals may be displaced, population-wide effects would be unlikely.

Southwestern Willow Flycatcher (FT)

No element occurrence for this species was documented for the project area. Its strict habitat requirement of dense cottonwood-willow communities in riparian areas may exist in the APE. Further survey work and consultation with cooperating agencies would be required to document occurrence of the species and/or its habitat. Potential habitats that occur in riparian areas could be affected by all of the alternatives, with direct footprint impacts ranging from 4.1 acres Dual-Mode or Diesel Bus in Guideway) to 10.6 acres (Six-Lane Highway with Rail and IMC).

Amphibians and Reptiles

Boreal Toad (FC, SE, FS, Management Indicator Species)

This toad species would be susceptible to impacts from habitat loss, an expanded REZ including downstream effects to habitats, and induced growth.

Habitat loss would potentially be a serious effect, as there are five known breeding locations in the Straight Creek (milepost 209) and upper Clear Creek areas (Loveland Ski Area, Herman Gulch, Dry Gulch, and drainage across from Mount Bethel) that could be directly affected by an expanded construction disturbance zone. The Combination alternatives would have the most potential to affect the habitat of this species. Data on acreages of disturbance of boreal toad habitat are available in the Impact Data Tables in Appendix A, Environmental Analysis and Data.

The No Action, Minimal Action, and AGS alternatives are expected to have no impact on boreal toad habitat. Potential impacts on boreal toad from other project alternatives, including the alternative footprint, construction disturbance zone, and sensitivity zone, would range from 0.1 acres (Bus in Guideway) to 0.7 acres (Combination Six-Lane Highway with Rail and IMC). The Rail with IMC and the Highway alternatives are anticipated to have an intermediate impact on boreal toad habitat. The greatest impacts would result from the Combination alternatives.

Increased inputs of contaminated runoff and sediment into aquatic habitats may also have a substantial negative impact on boreal toads in the Corridor. Impacts to wetlands and other riparian areas would be minimized as much as possible, but temporary downstream effects may occur. Even though primarily USFS land, induced growth that brings additional people into those areas for recreation could also affect this species.

Northern Leopard Frog (SC, FS, BLM, SVC)

This species would be susceptible to impacts from habitat loss, an expanded REZ, and induced growth. The Combination Six-Lane Highway with Rail and IMC and Combination Six-Lane Highway with AGS alternatives would have the most direct impact on streams and riparian areas from construction footprint and support activities. Increased inputs of contaminated runoff into

aquatic habitats may have a substantial negative impact on leopard frogs. Induced growth that affects wetlands and aquatic habitats may potentially also affect this species.

Smooth Green Snake (G5, S4)

This species would be susceptible to impacts from habitat loss, as discussed for leopard frogs, as well as from an expanded REZ, and induced growth. Increased inputs of contaminated runoff into riparian habitats may have a substantial negative impact on smooth green snakes. Induced growth that affects wetlands and riparian habitats may potentially also affect this species.

Fish

Data on acreages of disturbance of the habitats of the Colorado River and greenback cutthroat trout are available on the Impact Data Tables in Appendix A, Environmental Analysis and Data. Because the distribution of these species was not separated according to drainage systems, the impacts were combined into a single category.

The No Action alternative is anticipated to have no impact on Colorado River cutthroat or greenback cutthroat trout. Also in the least category for impacts on these fish habitats would be the Minimal Action, the Bus in Guideway alternatives alone or in combination, and the Highway alternatives. These alternatives are anticipated to affect these trout habitats in a range from 0.5 to 0.6 acre.

The AGS alternative is anticipated to have an intermediate impact on Colorado River and greenback cutthroat trout habitat, potentially affecting 1.0 acre.

The greatest impacts are anticipated to result from the Combination Six-Lane Highway with AGS (1.2 acres) or with Rail and IMC (1.5 acres) alternatives.

The greenback cutthroat trout (FT, ST, S2, Management Indicator Species) in the Corridor at Dry Gulch and the less viable Clear Creek population may be affected by construction or REZ impacts. However, the healthy Dry Gulch trout populations occur upstream of I-70, which minimizes the potential for direct impacts. The Clear Creek population is unlikely to be reproducing, may already be affected by heavy metal contamination, and may exist due to trout migrating from Dry Gulch (B. Rosenlund, USFWS, personal communication.)

Four other fish species would be affected if there are water depletion or water quality changes downstream in the Colorado or Platte River systems. The effects of road construction would depend on the particular requirements of each construction project for portions of the Corridor and will be considered in the Tier 2 studies. The primary effects of all the alternatives on the Colorado River species, including Colorado pikeminnow (FE, ST, S1), razorback sucker (FE, SE, S1), bonytail chub (FE, SE), and humpback chub (FE, ST, S1) would involve the potential for water flows and quality to be affected at downstream locations in the Colorado River. These fish species occur primarily in the larger, slower moving reaches of the Colorado River west of Grand Junction. In addition, the Colorado River cutthroat trout (FS, BLM, SC, S3, Management Indicator Species) may be affected by impacts on the Dillon Reservoir, Upper Gore Creek, or the Eagle River. TES fish impacts would primarily be associated with instream flow reductions and influx of material that would affect water quality. Any reductions in this drainage basin would need to be compensated according to USFWS requirements. As areas develop along the Corridor, the potential for water quality to be affected by increased runoff from paved surfaces, disturbed construction sites, and landscaping inflows (such as golf courses, home, and commercial areas) becomes greater. Similar considerations would apply to depletions downstream in the Missouri River for the pallid sturgeon (FE).

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Invertebrates

Background information on invertebrate species along the Corridor is sparse, as few studies have been conducted to date that provide location data. The low-mobility species require specific habitats and particular plant species that would not be common on or adjacent to the I-70 right-of-way. Thus, it would be unlikely that these species would be appreciably affected by the alternatives. The most likely species affected by habitat losses would include the tiger beetle (G4, S2) from ponderosa pine habitat that would be affected the most by the Rail with IMC alternative (approximately 19 acres in the construction disturbance zone); and the mottled dusky wing (G4, S2S3) from losses of mountain shrubland that would be affected the most by the Combination Six-Lane Highway with Rail and IMC alternative (approximately 21 acres in the construction disturbance zone) and the Combination Six-Lane Highway with AGS alternative (approximately 22 acres in the construction disturbance zone). Other species that would unlikely be affected by the alternatives occur in the habitat: the hops feeding azure butterfly (G2, S2) is associated with vegetation on steep ravines along the area from Floyd Hill to C-470 that would unlikely be appreciably affected by construction. Butterflies and moths would likely be affected to some degree by collisions with vehicles as they cross the Corridor, which would increase as traffic volumes increase. The general trend for development to increase noxious weed and non-native plant invasions, which replace native species, would be detrimental to these species in general.

TES Animal Impacts Summary

Table 3.3-4 summarizes the principal impacts that were identified as likely to affect each of the TES species discussed in section 3.3.3.2.

Table 3.3-4. Impacts from the Alternatives Most Likely to Affect TES Animal Species

Species	Direct Habitat Loss	Barrier Effect	Road Effect Zone (Roadway Runoff Contamination, Noise, Noxious Weed Increase)	Water Depletions
Canada lynx	X	X		
North American wolverine		X		
American marten		X		
Northern river otter			X	X
Townsend's big-eared bat	X			
Spotted bat				
Preble's meadow jumping mouse			X	
Pygmy shrew	X			
Bald eagle			X	
American peregrine falcon			X	
Northern goshawk	X			
Sage grouse	X	X		
Sage sparrow	X	X		
Brewer's sparrow	X	X		
Olive-sided flycatcher	X			
Three-toed woodpecker	X			
Boreal owl	X			
Black swift	X			
Whooping crane				X

Species	Direct Habitat Loss	Barrier Effect	Road Effect Zone (Roadway Runoff Contamination, Noise, Noxious Weed Increase)	Water Depletions
Eskimo curlew				X?
Interior least tern				X
Piping plover				X
Northern harrier			X	
White-tailed ptarmigan	X?			
Mexican spotted owl	X?		X?	
Flammulated owl	X?			
Southwestern willow flycatcher	X?	X?	X?	
Boreal toad	X	X	X	X
Northern leopard frog	X		X	X
Smooth green snake	X		X	X
Colorado pikeminnow			X	X
Humpback chub			X	X
Bonytail chub			X	X
Razorback sucker			X	X
Pallid sturgeon				X
Colorado River cutthroat trout			X	X
Greenback cutthroat trout			X	X
Hops feeding azure		X	X	
A tiger beetle	X		X	
A moth		X	X	
Mottled dusky wing	X	X	X	
A tiger moth		X	X	
Polixenes arctic		X	X	
Crossline skipper		X	X	

X? = Unknown effect

3.3.3.3 Impacts on TES Plant Species

Identifying specific locations of TES plant species in the Corridor requires in-depth field surveys of appropriate habitats. Such surveys would occur in conjunction with specific construction plans during Tier 2 studies to avoid areas containing these species. Most of the habitats containing TES species occur in undisturbed areas some distance from the I-70 right-of-way; thus, direct impacts from all of the alternatives are expected to be low. Also, special effort was made to map and avoid high-altitude fens, which are important habitat for several TES plant species. REZ-related effects are most commonly expected and can occur from roadway runoff, contaminant movements into habitats, and weed invasions that displace native plants.

Induced development and recreation may have negative effects on TES plants that occur in habitats within the APE. In addition to habitat alterations and loss, impacts would include trampling, picking, and collecting. Alternatives that increase highway capacity would likely induce the greatest amount of rural development and dispersed recreation activity. However, because of the lack of TES plant location information, it is difficult to estimate the relative magnitude of impacts from alternatives on

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TES plants in the APE. The principal impacts likely to affect plant species are summarized in Table 3.3-5.

Table 3.3-5. Impacts from the Alternatives Most Likely to Affect TES Plant Species

Species Common Name	Direct Suitable Habitat Loss	REZ Effects	Water Depletions
Rocky Mountain columbine	X?		
Wild sarsaparilla		X	X
Forked spleenwort	X?		
Meadow milkvetch	X	X	
Park milkvetch	X	X	X
Leadville milkvetch	X?		
Reflected moonwort	X		
Western moonwort	X	X	
Triangle moonwort	X	X	
Narrow-leaved moonwort		X	X
Common moonwort	X		
Mingan moonwort	X	X	X
Leathery moonwort		X	X
Pale moonwort	X		
Northwestern moonwort	X	X	X
Least moonwort	X	X	X
Low northern or elegant sedge		X	
Lesser panicled sedge		X	X
Bristle-stalk sedge		X	X
Livid sedge		X	X
Purple cinquefoil		X	X
Willow hawthorn		X	X
Purple lady's-slipper	X		
Yellow lady's slipper	X		
Brittlefern	X	X	X
Roundleaf sundew		X	X
Dropleaf buckwheat	X		
Altai cotton-grass		X	X
Slender cotton-grass		X	X
Hall's fescue	X?		
Dwarf rattlesnake-plantain	X	X	X
Simple kobresia	X?		
Canyon bog-orchid	X	X	
Northern twayblade	X?	X	
Broadlipped twayblade	X	X	
Marsh felwort	X	X	X
Club-moss	X	X	

Species Common Name	Direct Suitable Habitat Loss	REZ Effects	Water Depletions
Colorado tansy-aster	X		
Weber's monkeyflower		X	X
Kotzebue's grass-of-Parnassus	X		
Harrington's beardtongue	X	X	
Colt's foot		X	X
Western prairie fringed orchid			X
Rocky Mountain polypody	X		
Front Range cinquefoil	X	X	
Porter feathergrass		X	X
Pictureleaf wintergreen	X	X	
Dwarf raspberry		X	X
Hoary willow	X	X	X
Autumn willow		X	X
Lesser club-moss		X	X
Bigelow groundsel	X	X	X
Sphagnum		X	X
Ute ladies'-tresses orchid		X	X
Hanging garden sullivantia		X?	
Lesser bladderpod		X	X
Prairie violet	X	X	
Selkirk violet	X	X	

X? = unknown effect

3.3.4 Mitigation Measures

Informal Section 7 consultation with the USFWS was initiated through a letter requesting the species expected to occur in the project area (Appendix F, Biological Resources and Wetlands Documentation). Also, field inspections were conducted to identify fens and old-growth forest to be avoided by project alternatives. Habitat loss of TES species would be minimized by placing the new facilities (such as lanes or structures) in the right-of-way and avoiding rare habitats where possible. Impacts on biological resources would be minimized where possible through alignment shifts and structural adjustments away from sensitive habitats.

Habitat loss of TES species would be minimized by placing the new facilities (such as lanes or structures) in the right-of-way and avoiding rare habitats where possible. Impacts on biological resources would be minimized where possible through alignment shifts and structural adjustments away from sensitive habitats, using elevated segments in critical areas such as Idaho Springs, and through the use of walls to minimize cut-and-fill slopes.

Adding wildlife crossing structures and improving existing structures, as recommended by the ALIVE committee, would reduce the barrier effect of I-70 through the Corridor in areas that are especially important linkages and identified as linkage interference zones. Wildlife fencing would need to be established, extended, or repaired in these areas as well to reduce animal-vehicle collisions.

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Road effect zone impacts related to sedimentation and contaminated runoff would be reduced through construction of sedimentation ponds to capture runoff and through the use of other CDOT best management practices to reduce erosion and road runoff. When projects reach the Tier 2 level, weed management plans would be included (per CDOT regulations) to curtail the spread of noxious weeds into habitats.

Intensive surveys of TES species habitats will be required as part of specific project development, and this information will be incorporated in project design to avoid affecting such species to the extent possible. The analysis of impacts on TES species has been coordinated with the USFWS at this Tier 1 level of study and will continue in Tier 2 studies. A Biological Assessment according to ESA requirements and USFWS guidelines will document such actions, and a Biological Evaluation per USFS guidelines for TES species and management indicator species has been developed for this project. Protection measures for TES and management indicator species will be addressed during the project design and during implementation in Tier 2 for this project.