WILDLIFE TECHNICAL REPORT

NORTH I-25 EIS
ADAMS, BOULDER, BROOMFIELD, DENVER, LARIMER, AND WELD COUNTIES, COLORADO

October 2008

Prepared for
Colorado Department of Transportation
Region 4

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OCTOBER 2008

Introduction

The Colorado Department of Transportation (CDOT) is preparing an Environmental Impact Statement (EIS) for alternatives to improve transportation facilities in an area known as the North I-25 EIS regional study area (regional study area).

This Wildlife Technical Report has been prepared in support of the North I-25 EIS to address issues related to the potential effects on wildlife of state concern, migratory birds, and other wildlife resources in the project area. This report includes a description of the proposed project, existing conditions in the project area, a description of impacts of the project, and proposed mitigation measures. This Wildlife Technical Report will be used to identify wildlife resources in the project area, and provides a comparison for conditions under the proposed alternatives. An analysis of potential impacts resulting from the project to wildlife and wildlife habitat, and a description of conservation measures is also included in this document.

The proposed project consists of highway and transit improvements in the area from Fort Collins south to Denver. The project includes two packages of alternatives, Package A and Package B.

Package A would include:

- adding lanes to I-25,
- upgrading interchanges on I-25 from State Highway (SH) 14 south to E-470,
- constructing a commuter rail line from Fort Collins south to connect with the proposed North Metro Corridor,
- adding commuter bus service on U.S. 85 from Greeley south to Denver, and
- constructing commuter bus and rail stations along the commuter rail alignment and along U.S. 85.

Package A would include nine commuter rail stations located in Fort Collins (three stations), Loveland (two stations), Berthoud (one station), Longmont (two stations), and Erie (one station). Five commuter bus stations would be located on U.S. 85, including Greeley (two stations), Evans (one station), Platteville (one station), and Fort Lupton (one station). Queue jumps (bus-only lanes) would be added at several locations on U.S. 85 and U.S. 34.

Package B would include:

- adding new managed toll lanes to I-25 and upgrading interchanges on I-25,
- adding bus rapid transit service with feeder bus service, and
- constructing bus stations along I-25 and at other locations.

Package B would include 12 bus rapid transit stations located in Fort Collins, Harmony Road at Timberline Road, I-25 at Harmony Road, I-25 at Highway 392, I-25 at Crossroads Boulevard, Highway 34 at Highway 257, Highway 34 at 83rd Street, Greeley, I-25 at Highways 56 and 60, I-25 at Highway 119, I-25 at Highway 52, and I-25 at Highway 7.

Each package would include either a bus or transit maintenance area.

Regional Study Area and Project Area

The North I-25 EIS regional study area (regional study area) is bounded generally by U.S. Highway 287 (U.S. 287) on the west, U.S. 85 on the east, Wellington on the north, and Denver on the south (see Figure 1). The regional study area is located primarily in Adams, Boulder, Larimer, and Weld counties; and includes small sections within Broomfield and Denver counties. The regional study area includes all areas that were addressed during initial screening of alternatives.

The draft EIS will address two packages of alternatives, Package A and Package B, as well as a No Action Alternative. The project area is defined as the areas used by wildlife that could be affected by the proposed project under either Package A or Package B, including sections of I-25 proposed for widening, proposed rail alignment, proposed transit stations and queue jumps, and proposed maintenance area.

Along I-25, the project would mostly affect land within the CDOT right-of-way. The median would be used where widening is needed in the southern one-third of the project area, between SH 7 and SH 66. Land within the CDOT right-of-way and median consists mostly of mowed grasslands with riparian trees and shrubs along major drainages. Outside of the CDOT right-of-way, surrounding land is mostly privately owned irrigated cropland, nonirrigated cropland, and commercial development. The transit stations would be primarily located on agricultural or vacant lands.

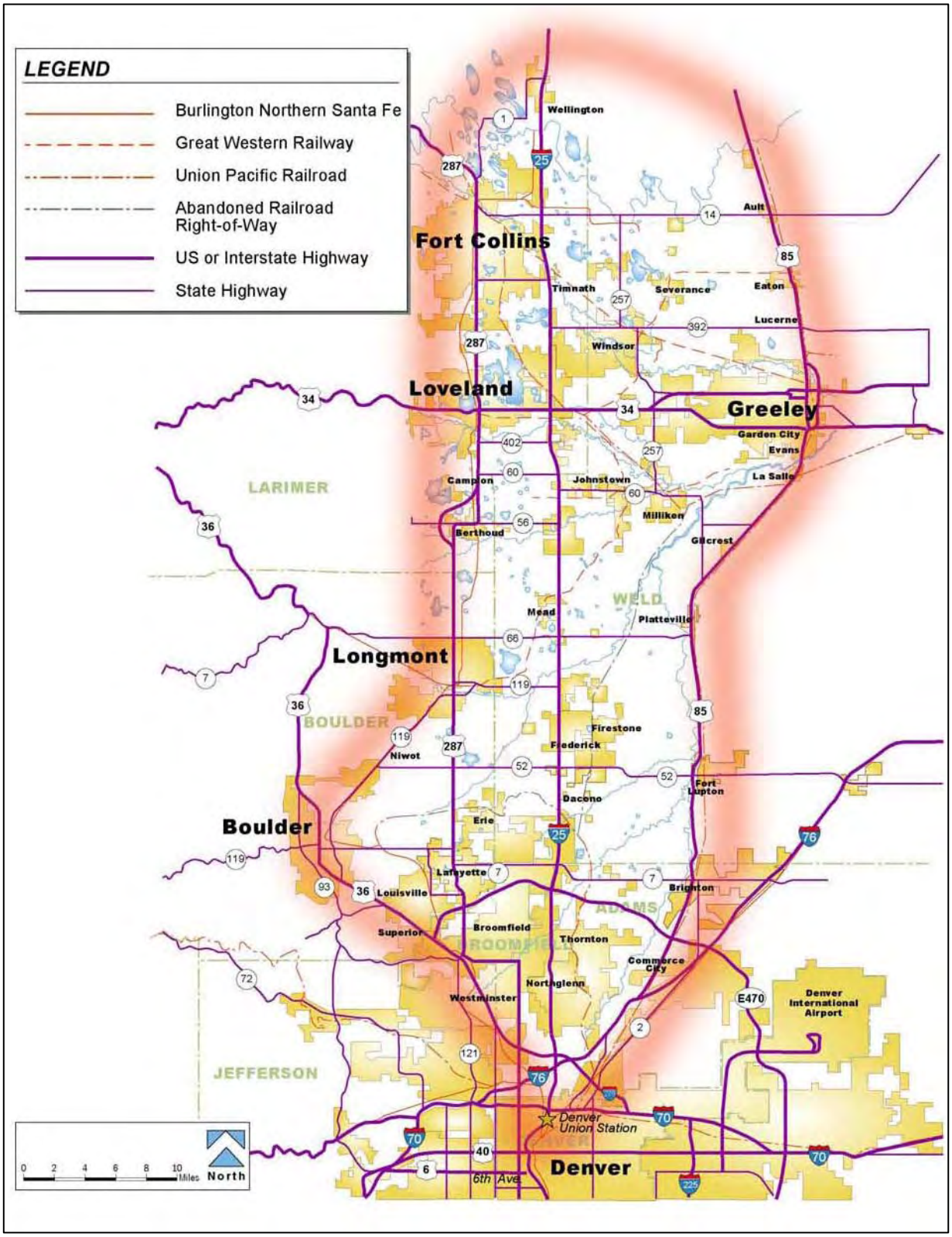
The commuter rail line would primarily affect land within the Burlington Northern Santa Fe (BNSF) railroad right-of-way between Fort Collins and Longmont or within the abandoned Union Pacific Railroad (UP) right-of-way from about Weld County Road 10 to the connection

with the proposed North Metro Corridor. Between Longmont and Weld County Road 10, the commuter rail line would follow SH 119 east, and would then turn south to follow Weld County Road 7. Land within the BNSF and UP rights-of-way consists mostly of unmowed grasslands with riparian trees and shrubs at crossings of major rivers and streams. Land use surrounding the commuter rail alignment is mostly agricultural, with residential development in Fort Collins, Longmont, and other communities along the alignment. Land along SH 119 consists of a mixture of publicly owned open space and private land that is mostly developed. The transit stations would be primarily located on agricultural or vacant lands.

Some species of wildlife are more mobile than others, so the width of the project area varies depending on the species. For most wildlife species, the project area extends ½ mile from the center line of either I-25 or from the center line of the proposed rail alignment. For bald eagles, the project area extends 1 mile from the center line of I-25 or the proposed rail alignment. For less-mobile species, such as prairie dogs and most invertebrates, the project area extends 150 feet from the center line of I-25 or the proposed rail alignment.

Major drainages in the project area run in an easterly direction and include, from north to south, the Cache la Poudre River, Fossil Creek, Big Thompson River, Little Thompson River, St. Vrain Creek, Little Dry Creek, Big Dry Creek, and South Platte River.

Figure 1. North I-25 EIS Regional Study Area.



Regulatory Framework

CDOT projects must comply with federal, state, and local laws and regulations protecting wildlife species including:

- The Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.);
- The Fish and Wildlife Coordination Act of 1934, as amended (16 U.S.C. 661-667e);
- The Bald and Golden Eagle Protection Act of 1940, as amended (16 U.S.C. 668-668d);
- The Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703-712);
- Executive Order 13186;
- Colorado State Statute 33 (Colo. Rev. Stat. Ann. §§ 33-2-102-106);
- Senate Bill 40 (SB40)

CDOT also has a prairie dog policy that applies to all CDOT projects. In addition, a portion of the project area is covered by the City of Fort Collins' The Fossil Creek Reservoir Area Plan. All of these federal and state laws and CDOT policies area described below.

Federal Endangered Species Act

Federally listed threatened and endangered species are protected under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.). Potential effects on a federally listed species or its habitat resulting from a project with a federal action require consultation with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the ESA. Projects that may result in adverse modification of designated critical habitat for a federally listed species also require consultation with the USFWS. No regulations require consultations for effects to candidate species; however, if a species were to become listed during project planning or construction, consultation with the USFWS would be required. Upon final selection of an alternative package for the Final Environmental Impact Statement (FEIS), a Biological Assessment and formal Section 7 consultation (if necessary) would be undertaken.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act of 1934, as amended (16 U.S.C. 661-667e) provides that whenever the waters or channel of a body of water are modified by a department or agency of the U.S., the department or agency first shall consult with the USFWS and with the head of the agency exercising administration over the wildlife resources of the state where construction will occur, with a view to the conservation of wildlife resources.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act provides for the protection of the bald eagle and the golden eagle by prohibiting the taking, possession, and use of these two species for commerce except under certain specified conditions. The definition of "take" includes to: pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb. In 2007, the term disturb was defined to mean "to agitate or bother a bald or golden eagle to a degree that causes, injury to an eagle, a decrease in productivity, or nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior" (72 Fed. Reg. 31332).

Migratory Bird Treaty Act

Originally passed in 1918, the Migratory Bird Treaty Act (MBTA) protects raptors and other migratory birds and their active nest sites. The MBTA provides that it is unlawful to pursue, hunt, take, capture, or kill; attempt to take, capture, or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried, or received any migratory bird, part, nest, egg, or product, manufactured or not. In Colorado, most birds, except for the European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), rock dove (*Columbia livia*) (pigeon), and grouse/pheasant species (Order *Galliformes*), are protected under the MBTA (§§ 703-712).

The MBTA stipulates that it is unlawful to destroy an active migratory bird nest, nestling, or eggs. The USFWS allows vacant nests to be destroyed, but active nests with birds, their young, or eggs must be left undisturbed (USFWS 2003a). For most migratory bird species, the active nesting season is between March and August. Under the MBTA, the USFWS may issue Nest Depredation Permits, which would allow a permittee to remove an active nest. The USFWS, however, issues very few Nest Depredation Permits, and only under specific circumstances.

Executive Order 13186

Executive Order 13186, signed by President Clinton in 2001, directs federal agencies to take certain actions to implement the MBTA, including avoiding and minimizing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions (86 FR 3853).

Colorado State Statute 33

According to Colorado law (Colo. Rev. Stat. Ann. §§ 33-2-102-106), the state must maintain a list of species determined to be endangered or threatened within the state. State-listed wildlife species that are not already protected under federal law (i.e., ESA) are protected under State Statute 33, which is regulated by the Colorado Division of Wildlife (CDOW). Colorado Revised Statute 33 states that it is unlawful for any person to take, possess, transport,

export, process, sell or offer for sale, or ship and for any common or contract carrier to knowingly transport or receive for shipment any species or subspecies of wildlife appearing on the state list of threatened and endangered wildlife (CRS Ann. §§33-2-105). Also under State Statute 33, the Colorado Wildlife Commission (Commission) issues regulations and develops management programs for Colorado species that are implemented by CDOW.

SB40

SB40 (33-5-101-107, C.R.S. 1973, as amended) requires any agency of the state to obtain wildlife certification from CDOW when the agency plans construction in any stream or its bank or tributaries. CDOT has developed a Memorandum of Agreement, in cooperation with CDOW, for SB40 wildlife certification (CDOT 2003).

Fossil Creek Reservoir Area Plan

Land use within the area around Fossil Creek Reservoir is guided by the policies and principles presented in the Fossil Creek Reservoir Area Plan (Fossil Creek Plan) adopted in 1998, amended in 1999, and amended again in 2000 (City of Fort Collins and Larimer County 1998) and the Resource Management and Implementation Plan for Fossil Creek reservoir regional Open Space (EDAW 2003). The Fossil Creek Plan establishes natural area buffers ranging from 100 to 1,320 feet. Buffers for bald eagles in the Fossil Creek Plan, as recommended by the CDOW, include buffers around bald eagle winter roost sites (1,320 feet) and bald eagle hunting and feeding sites (660 to 1,320 feet). The Fossil Creek Plan establishes colonial nesting sites for great blue herons and black-crowned night herons (825 feet) and for waterfowl, shorebird, or wading bird production areas, wintering areas, or feeding areas (300 feet).

CDOT Prairie Dog Policy

CDOT adopted an Impacted Prairie Dog Policy on March 4, 2005 (see Appendix A). The policy consists of a series of steps that include avoiding prairie dog colonies and minimizing impacts, relocating prairie dog towns if feasible and if avoidance is not possible (for colonies greater than 2 acres in size), donating prairie dogs to raptor rehabilitation facilities or the USFWS black-footed ferret reintroduction program, and humanely euthanizing prairie dogs in construction areas if no other options are available. The policy also requires contacting CDOW's District Wildlife Manager before manipulation of prairie dogs or their colonies begins (CDOT 2005).

Methods

Regional Study Area

Wildlife resources in the regional study area were reviewed during initial screening of alternatives using existing information from readily available sources. Existing information was reviewed and special concerns related to the project were identified through coordination and consultation with the USFWS, CDOW, Colorado Natural Heritage Program (CNHP), and local open space management agencies. CDOT requested input from CDOW and USFWS during meetings that were held to discuss the project on May 2, 2006, June 19, 2006, and September 18, 2006. CNHP also provided data on rare species in the project area. Most wildlife distribution data came from CDOW's Natural Diversity Information Source (NDIS). Habitat types and sensitive natural resources in the regional study area were identified based on existing documentation, aerial photo interpretation, and limited field confirmation. Only reconnaissance-level surveys and fortuitous observations of rare species were conducted within the regional study area. No site-specific presence-absence surveys were conducted during initial review of the regional study area.

Project Area

Once the project area was identified, more detailed habitat evaluations were performed within the project area based on fieldwork and additional review of existing information:

- Preble's meadow jumping mouse habitat was evaluated in the field and USFWS Preble's trapping data for potential crossings of major drainages were reviewed.
- Bald eagle nest and roost location data was updated with more site-specific information obtained from field reconnaissance and from the Rocky Mountain Bird Observatory (RMBO).
- Black-tailed prairie dog colonies were initially mapped based on information provided by CDOW (CDOW 2002). Prairie dog mapping was updated within ½ mile of the north I-25 corridor and the proposed commuter rail alignment based on aerial photograph interpretation with field verification. Prairie dog colonies within proposed transit station sites were also mapped based on aerial photography with field verification.
- Stick nests that were confirmed or suspected to be used by raptors were mapped in the field within ½ mile of the north I-25 corridor and the proposed commuter rail alignment. Raptor nest mapping occurred primarily in April 2005 and April 2006.

- Potential wildlife crossing areas were identified based on CDOW input, road mortality data from CDOT and the Colorado State Patrol, and field review. Identification of potential wildlife crossings focused on areas in the proposed alignment right-of-way, vacant lots, drainage ditches, floodplains and floodways, parks, golf courses, open space, and other landscape features conducive to wildlife movement.

It is expected that more detailed surveys would be conducted prior to construction of any build alternative. The field team did not attempt to identify natural resources within residential and commercial developments, and did not access private land to conduct the inventory with the exception of railroad rights-of-way along the proposed commuter rail alignment.

Existing Conditions

Federally Listed Threatened, Endangered, and Candidate Species

Federally listed threatened, endangered, and candidate wildlife species that potentially occur in the regional study area are shown in Table 1. Correspondence with USFWS indicated that these species should be addressed in the EIS (USFWS 2005a).

Table 1. Federally listed threatened and endangered wildlife species potentially occurring in the regional study area (USFWS 2005a).

Common Name	Latin Name	Status
Black-footed ferret	*Mustela nigripes*	Endangered
Preble's meadow jumping mouse	*Zapus hudsonius preblei*	Threatened
Mexican spotted owl	*Strix occidentalis lucida*	Threatened

Table 2 lists species that could potentially be affected by water depletions in the Platte River system (USFWS 2005a). Species on this list could be adversely affected by water depletions associated with a variety of project elements including detention ponds and dust-abatement activities. Species listed in Table 2 are unlikely to occur in the regional study area and will not be addressed further in this Wildlife Technical Report. Potential impacts to Platte River system species will be addressed, if necessary, in a Biological Assessment to be prepared at a later date as part of consultation with the USFWS.

Table 2. Federally listed wildlife species with potential to be affected by depletions to the Platte River system (USFWS 2005a).

Common Name	Scientific Name	Federal Status
Whooping crane	*Grus Americana*	Endangered
Least tern	*Sterna antillarum*	Endangered
Eskimo curlew	*Numenius borealis*	Endangered
Piping plover	*Charadrius melodus*	Threatened
Pallid sturgeon	*Scaphirhynchus albus*	Endangered

The following sections provide a description of habitat requirements for each species and an assessment of the potential for habitat in the regional study area to support the species.

Black-footed Ferret

Species Background, Habitat Requirements, and Distribution

The black-footed ferret is listed as endangered under the ESA. Black-footed ferrets are associated with black-tailed prairie dog (*Cynomys ludovicianus*) colonies where they depend on this species for food and shelter (Fitzgerald et al. 1994). Prior to the discovery of a population of black-footed ferrets in 1981 at Meeteetse, Wyoming, it was believed that this species was extinct. The widespread practice of poisoning prairie dogs during settlement of the west is thought to have been a major factor in the black-footed ferret's demise (CDOW 2006a). Currently, black-footed ferrets are known to exist only in the Shirley Basin of Wyoming, in captive breeding facilities in various locations across the country, and in various sites where captive reared ferrets have been reintroduced into the wild (Fitzgerald et al. 1994; CDOW 2006a).

The last official record of a black-footed ferret in Colorado was near Buena Vista in 1943 (CDOW 2006a). Despite considerable search time in western Colorado and on the eastern plains by various state and federal agency staff, no naturally occurring populations of black-footed ferrets have been found in Colorado (Fitzgerald et al. 1994). Since 2001, two black-footed ferret populations have been established in Colorado at Coyote Basin and at the Wolf Creek Management Area, both in the northwestern part of the state (CDOW 2006a).

Potential Habitat

In 1989, the USFWS published black-footed ferret survey guidelines stating that black-tailed prairie dog towns or complexes of greater than 80 acres are considered potential black-footed ferret habitat (USFWS 1989). However, no new populations of black-footed ferrets

have ever been discovered in Colorado using these methods. No critical habitat has been designated for this species.

In July 2007 the Service published a map of "Block-cleared Areas for Black-Footed Ferret Surveys in Colorado" (USFWS 2007). In designating a block clearance zone, the Service eliminated the need for individuals or agencies to coordinate with the Service prior to conducting activities in habitats that otherwise would be deemed to have potential to support the black-footed ferret.

Because the entire project area is within a block clearance zone, the black-footed ferret is assumed to be absent from the project area and the potential occurrence of this species in the project area or impacts to this species will not be addressed further in this Wildlife Technical Report.

Preble's Meadow Jumping Mouse

Species Background, Habitat Requirements, and Distribution

Preble's meadow jumping mouse (Preble's) was listed as a threatened species on May 13, 1998 under the ESA of 1973, as amended (63 FR 66777 [December 3, 1998]). In March 2004, the USFWS initiated a status review of Preble's based on two petitions to remove Preble's from federal protection under the ESA (USFWS 2004a). On February 2, 2005, the USFWS proposed to delist Preble's (70 FR 5405). On February 17, 2006, the USFWS announced a 6-month extension of the time required to make the decision on whether to delist Preble's. Until a final determination of Preble's status under the ESA in 2007 is made, the USFWS will continue to manage Preble's as a threatened species in accordance with existing laws and policies.

Typically, Preble's occurs in low undergrowth consisting of grasses and forbs, in open wet meadows, riparian corridors, or where tall shrubs and low trees provide adequate cover (USFWS 2004c; Meaney et al. 1997). Preble's occurs below 7,600 feet in elevation, generally in lowlands with medium to high moisture along permanent or intermittent streams (USFWS 2004c; CNHP 1996; Ryon 1996). Research by CDOW has suggested that habitat quality for Preble's can be predicted by the amount of shrub cover available at a site (White and Shenk 2000).

Potential Habitat

A number of riparian areas in the project area have potential habitat for Preble's, including the Cache la Poudre River, Spring Creek, Fossil Creek, Big Thompson River, Dry Creek, Little

Thompson River, St. Vrain River, and South Platte River. ERO Resources Corporation (ERO) evaluated the project area for Preble's habitat during site visits on April 18, April 22, and August 31, 2005. ERO also reviewed trapping records maintained by the USFWS. Trapping records show that trapping surveys have been conducted on all of the major drainages in the project area (Table 3). Trapping surveys have found Preble's in riparian habitat near the Big Thompson and Little Thompson rivers east of I-25 (USFWS 2005b). Preble's is assumed to be present in riparian habitat along the Big Thompson and Little Thompson rivers. The other drainages in the project area have been surveyed extensively for Preble's in the past and available information indicates that these sites are unlikely to support populations of Preble's. It is likely that the facilities associated with the preferred alternative identified in the EIS would not be constructed for several years, and available information on Preble's distribution may need to be reevaluated prior to construction. Critical habitat has been designated in Larimer County; however, no designated critical habitat for this species occurs in the project area. Past trapping surveys near each crossing of a major drainage by proposed project components are shown in Figure 2 and summarized in Table 3.

Figure 2. North I-25 EIS: Preble's Meadow Jumping Mouse Trapping Data.

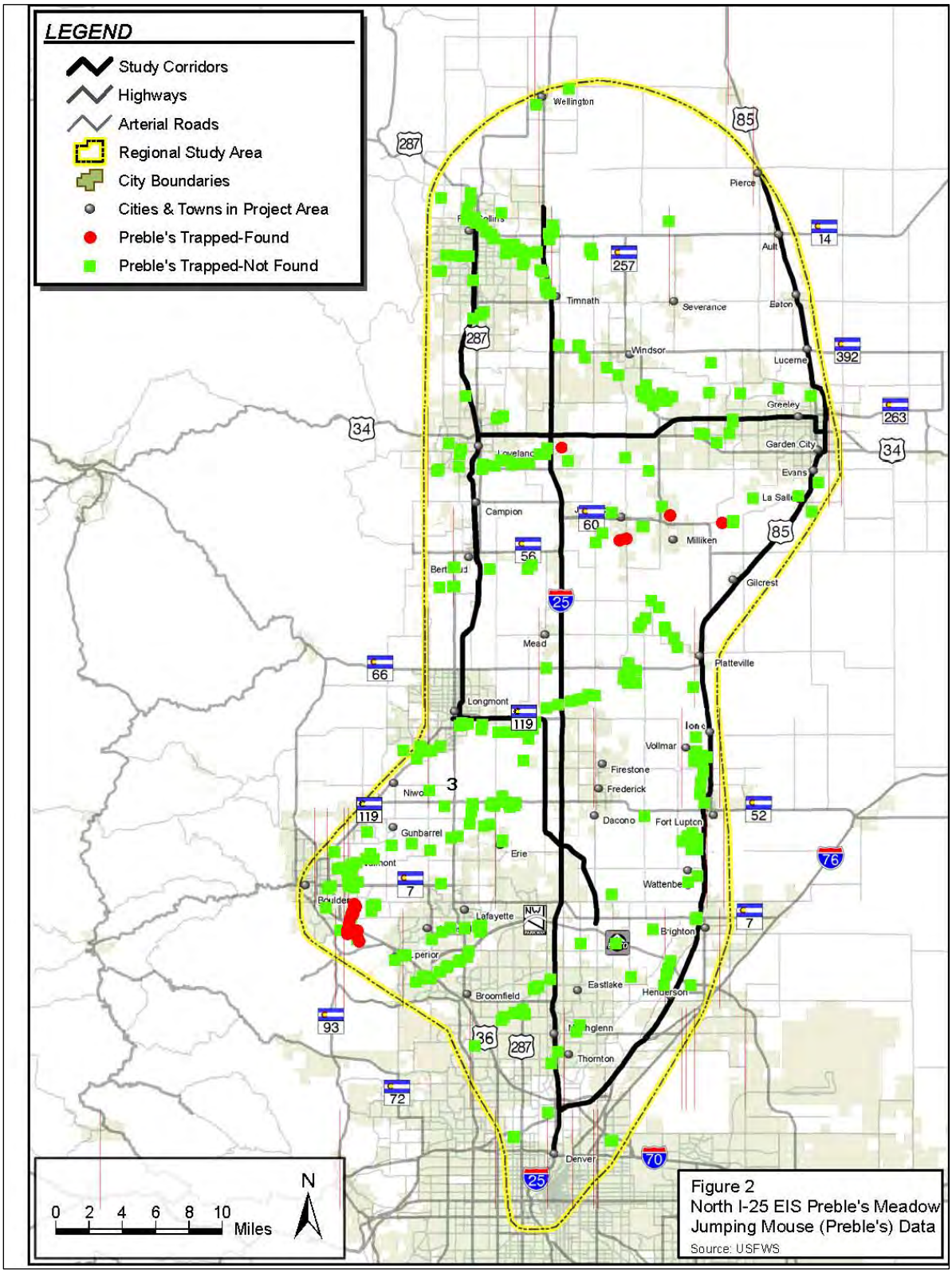


Table 3. Summary of Preble's trapping records for project area.

Location	Past Trapping Surveys	Conclusion
Cache la Poudre River at commuter rail alignment	Five negative trapping surveys from 1998 to 2002 within 1 mile upstream or downstream.	Available data indicates that this portion of the project area is not occupied by Preble's.
Cache la Poudre River at I-25	Three negative trapping surveys from 1999 to 2004 within 1 mile of I-25. Additional negative trapping surveys within 10 miles.	Available data indicates that this portion of the project area is not occupied by Preble's.
Cache la Poudre River at Greeley Transit Station	One negative trapping survey within 1 mile in 2001. Negative trapping survey within 2 miles in 2000.	Urban area. Available data indicates that this portion of the project area is not occupied by Preble's.
Spring Creek at commuter rail alignment	Three negative trapping surveys from 2000 to 2002 within 1 mile of BNSF.	Available data indicates that this portion of the project area is not occupied by Preble's.
Fossil Creek at commuter rail alignment	Three negative trapping surveys from 1998 to 2000 within 1 mile.	Available data indicates that this portion of the project area is not occupied by Preble's.
Fossil Creek at I-25	One negative trapping survey in 2002 within 1 mile.	Not suitable habitat (cattails). Available data indicates that this portion of the project area is not occupied by Preble's.
Big Thompson River at commuter rail alignment	Two negative trapping surveys in 1999 and 2001 within 1 mile. Six additional trapping surveys between BNSF and I-25 were all negative.	Available data indicates that this portion of the project area is not occupied by Preble's.
Big Thompson River at I-25	Three negative surveys just west of I-25 from 1995 to 2003. One positive survey east of I-25 in 2001 less than 1 mile downstream.	Preble's is assumed to be present at this location and east of I-25.
Dry Creek at commuter rail alignment	Two negative trapping surveys within 1 mile in 1997 and 1998.	Available data indicates that this portion of the project area is not occupied by Preble's.
Little Thompson River at commuter rail alignment	Two negative trapping surveys within 1 mile from 1997 to 2000.	Available data indicates that this portion of the project area is not occupied by Preble's.
Little Thompson River at I-25	No surveys within 1 mile. Two positive surveys more than 1 mile east of I-25.	Preble's is assumed to be present at this location and east of I-25.
St. Vrain Creek at I-25 and SH 119	Four negative surveys within 1 mile upstream or downstream of I-25. Eight additional surveys between U.S. 287 and I-25, and two more surveys east of I-25 were all negative over the period of 1999 to 2003.	Available data indicates that this portion of the project area is not occupied by Preble's.
Little Dry Creek at I-25	Never surveyed. Evaluated not trapped several times, not suitable habitat (cattails).	Not suitable habitat, Preble's unlikely to occur.
Little Dry Creek at commuter rail alignment	Never surveyed. Evaluated not trapped several times, not suitable habitat.	Not suitable habitat, Preble's unlikely to occur.

Location	Past Trapping Surveys	Conclusion
Big Dry Creek at I-25	Within block clearance zone.	No surveys or mitigation required.
Big Dry Creek at commuter rail alignment	Within block clearance zone.	No surveys or mitigation required.
South Platte River at Ft. Lupton Transit Station	Seven negative trapping surveys within 2 miles upstream and downstream from 1998 to 2004.	Available data indicates that this portion of the project area is not occupied by Preble's. Also, transit station sites are not suitable habitat. Preble's unlikely to occur.
South Platte River at Platteville Transit Station	One negative trapping survey within 1 mile in 2002.	Potential transit station sites are not within suitable habitat. Preble's unlikely to occur.
South Platte River at Evans Transit Station	Two negative trapping surveys within 1 mile in 2000 and 2002.	One potential transit station is located near the Cache la Poudre River but is within a cultivated field and is not habitat. Preble's unlikely to occur.

Source: USFWS 2005b.

Mexican Spotted Owl

Species Background, Habitat Requirements, and Distribution

The Mexican spotted owl is listed as threatened under the ESA. It is found from southern Colorado and Utah through portions of New Mexico, Arizona, and Texas, south to central Mexico. This species typically inhabits areas with steep, exposed cliffs and canyons that are characterized by piñon-juniper and old-growth forests mixed with Douglas-fir (*Pseudotsuga menziesii*), ponderosa pine (*Pinus ponderosa*), and white fir (*Abies concolor*) (Andrews and Righter 1992). Nesting Mexican spotted owls have been documented in Colorado on the southern massif of Pike's Peak in Teller and El Paso counties, and in the Wet Mountains (Boyle *in* Kingery 1998). Critical habitat has been designated in the Pike National Forest in western El Paso and Douglas counties (69 FR 53182 [August 31, 2004]), as well as other areas in Colorado, Utah, Arizona, and New Mexico. No critical habitat has been designated in Adams, Boulder, Broomfield, Denver, Larimer, or Weld counties, including the project area.

Potential Habitat

The project area lacks the steep cliff and canyons or old-growth forests that provide habitat for this species. No designated critical habitat for Mexican spotted owl occurs in this area. A handful of records during winter and migration exist for this species in Boulder, Larimer, and Adams counties (Andrews and Righter 1992), but this species is probably very rare in these counties, even in suitable habitat. This species is unlikely to occur in the project area due to a lack of suitable habitat and will not be addressed further in this Wildlife Technical Report.

Other Federally Protected Species

Bald Eagle

Species Background, Habitat Requirements, and Distribution

The bald eagle is a large North American raptor with a historical distribution throughout most of the U.S. As a result of population declines attributed to habitat loss, the use of organochlorine pesticides, and mortality from shooting, the bald eagle was listed as an endangered species in 1978 (Buehler 2000; 43 FR 6233 [February 14, 1978]). Since its listing, the population trend for the bald eagle has been upward (Buehler 2000). The bald eagle was downlisted from endangered to threatened in 1995 (64 FR 36454 [July 6, 1999]). The USFWS recently removed the bald eagle from the list of threatened and endangered species due to population recovery (72 FR 37346 [July 7, 2007]). The delisting takes effect on August 8, 2007. The bald eagle continues to be protected under the MBTA and the Bald and Golden Eagle Protection Act.

Eagles feed primarily on fish and waterbirds but also feed on small mammals, mammal carcasses, and prey stolen from other raptors (Buehler 2000). Typical bald eagle nesting habitat consists of forests or wooded areas that contain many tall, aged, dying, and dead trees (Martell 1992). Bald eagles are migratory and are primarily winter residents in Colorado.

Nesting in Colorado and along the Colorado Front Range has increased in recent years. In 2001, there were an estimated 51 breeding pairs of bald eagles in Colorado, and more than 800 individuals were counted during winter (CDOW 2005a). Most nesting in Colorado occurs near lakes or reservoirs and along rivers.

"Essential" winter roosts are defined by the Northern States Bald Eagle Recovery Plan according to the following criteria (Northern States Bald Eagle Recovery Team [NSBERT] 1983):

- Locations used annually for 2 weeks or longer by adult or immature wintering eagles known (or strongly suspected) to be from nearby breeding areas;
- Locations used annually by 15 or more eagles for 2 weeks or longer (applies to Colorado and other specified states);
- Locations used by bald eagles during periods of extremely harsh weather when suitable feeding areas and night roost sites are limited in number (the minimum 2-week period of use does not apply to this criterion); and
- Areas demonstrating historically consistent use should be regarded as essential habitat if still suitable regardless of present use.

Figure 3 shows the locations of each type of bald eagle habitat mapped by CDOW (Natural Diversity Information Source [NDIS] 2006). Table 4 identifies types of bald eagle habitat: active nests, inactive nests, roost sites, communal roost sites, winter forage, winter range, summer forage, summer range, and winter concentration areas, and shows recommended setbacks for each.

Figure 3. North I-25 EIS: Bald Eagle Habitat.

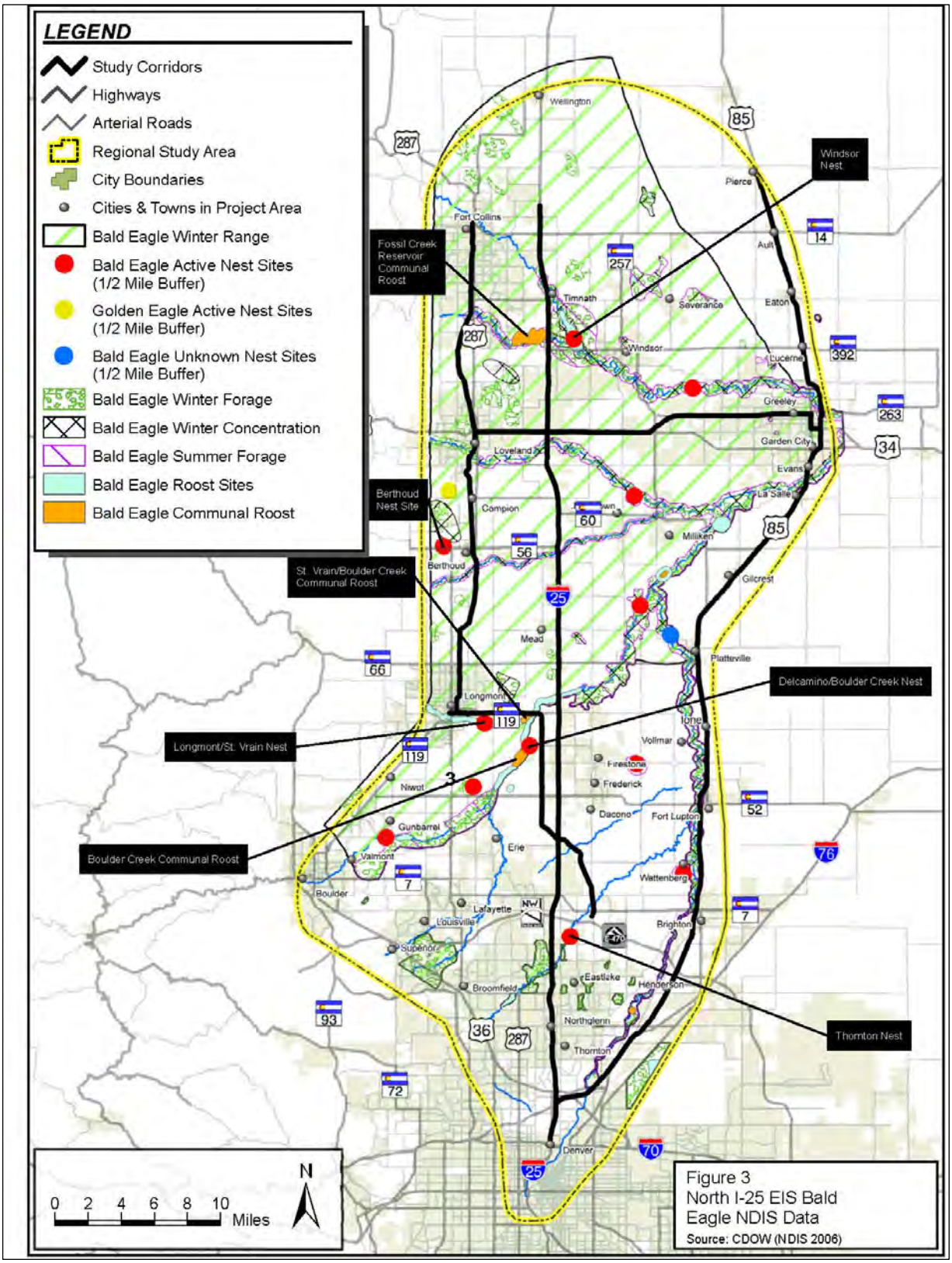


Table 4. Bald Eagle Habitat Types and Recommended Setbacks.

Habitat Type	Description	Recommended Setback
Active nest	A specific location in which a pair of bald eagles have at least attempted to nest within the last 5 years. Any nest location that can be directly tied to courtship, breeding, or brooding behavior is considered active.	Year-round closure within ¼ mile. Recommended buffer of ½ mile from November 15 to July 31.
Inactive nest	A former active nest location in which neither courtship, breeding, or brooding activity has been observed at any time during the last 5 years.	None (Craig 2002); ¼ mile (NSBERT 1983).
Communal roost site	Groups of or individual trees used by more than 15 eagles for diurnal and/or nocturnal perches.	Recommended buffer zone of ¼ mile from November 15 to March 15. Up to ½ mile if there is a direct line of sight from the roost.
Roost site	Groups of or individual trees that provide diurnal and/or nocturnal perches for less than 15 wintering bald eagles; includes a buffer zone extending ¼ mile around these sites. These trees are usually the tallest available trees in the wintering area and are primarily located in riparian habitats.	Recommended buffer zone of ¼ mile from November 15 to March 15. Up to ½ mile if there is a direct line of sight from the roost. Note that roost sites as mapped by CDOW already include a ¼-mile buffer.
Winter concentration	Areas (e.g., tree and islands) within an existing winter range where eagles concentrate between November 15 and April 1. These areas may be associated with roost sites.	None
Winter forage	Foraging areas frequented by wintering bald eagles between November 15 and March 15. May be a large area radiating from preferred roosting sites. In western Colorado, preferred roosting sites are within dominant riparian zones.	None
Winter range	Those areas where bald eagles have been observed between November 15 and April 1.	None
Summer forage	Foraging areas frequented by breeding bald eagles from March 15 to July 30. These areas are almost always associated with nesting pairs.	None

Sources: CDOW 2005d; Craig 2002.

Potential Habitat

Five active bald eagle nests occur within 3 miles of the sections of I-25 proposed for widening or the proposed rail alignment. These nests were monitored in 2006 and 2007 by the RMBO Bald Eagle Watch Program (RMBO 2007; Gamble 2006). Nest locations are shown in Figure 3 and are described below:

- Windsor Nest – An active bald eagle nest is known to occur on the Cache la Poudre River near the confluence with Fossil Creek, approximately 2 miles east of I-25 and

Fossil Creek Reservoir (NDIS 2006). This site has been used by nesting bald eagles since 2002, fledged one eaglet in 2006, and had two nestlings in 2007 (Gamble 2006; RMBO 2007).

- Berthoud Nest – A bald eagle nest occurs just west of the town of Berthoud, and just north of SH 56. A pair of eagles nested at this site in 2007, and hatched two nestlings on March 28 (RMBO 2007).
- Longmont/St. Vrain Nest – In 2006, a pair of bald eagles nested at a site on the St. Vrain Creek just west of the Boulder/Weld County line. This nest was new in 2006. Two adult eagles were observed at the nest incubating and adding nest material in March and April 2006 (Gamble 2006). This nest failed to produce fledglings in 2006, which is not unusual for a new nest. Nest building activity by a pair of eagles was reported at this nest from February 17 to March 15, 2007 (RMBO 2007).
- Delcamino/Boulder Creek Nest – This nest has been active for at least four nesting seasons (2003/2004, 2004/2005, 2005/2006, and 2006/2007) and is located more than ½ mile west of the intersection of Weld County Roads 7 and 20 on Boulder Creek (Beane 1996). This nest was apparently successful in 2006 as a juvenile eagle was observed at the nest in June (Gamble 2006). In April 2007, two nestlings were observed in the nest (RMBO 2007).
- Thornton Nest – This nest is located on Big Dry Creek near 148th Avenue and is approximately 1 mile east of I-25. This nest apparently failed in 2006. Two adults were observed incubating and apparently feeding young in March and April, but no eagles were observed in the nest area from late May through June (Gamble 2006). A pair of eagles nested at this site in 2007, and hatched two nestlings on April 10 (RMBO 2007).

CDOW mapping shows another active nest located approximately ½ mile northwest of the intersection of Highway 60 and Larimer County Road 17 (NDIS 2006). This site is approximately 1½ miles west of the proposed rail line and is occupied by golden eagles rather than bald eagles. This nest has successfully produced young golden eagles for at least 6 years as of 2006 (Ryel, pers. comm. 2006).

CDOW has identified roost sites at several locations that are adjacent to or within 1 mile of the project area (Figure 3).

- Fossil Creek Reservoir Communal Roost – CDOW has mapped a communal roost site at Fossil Creek Reservoir about ½ mile west of I-25 (NDIS 2006). Because most of the larger trees surrounding the reservoir are used by eagles in winter, and specific roost locations and levels of use can vary depending on prey availability, weather, and other factors, CDOW considers the reservoir as a whole when mapping the limits of the roost. As mapped by CDOW, the communal roost covers the majority of the reservoir, and extends about ¼ mile from the edge of the reservoir, not including the southeastern finger of the reservoir (Swede Lake).

- St. Vrain Creek and Boulder Creek Roost – CDOW has mapped the section of St. Vrain Creek from west of U.S. 287 to east of I-25 and the section of Boulder Creek starting about 5 miles upstream from the confluence with St. Vrain Creek to the confluence with St. Vrain Creek as a bald eagle roost site. Field visits by ERO biologists in February and March 2005 confirmed that bald eagles were using this general area for roosting.
- Boulder Creek Communal Roost – A communal roost site is located about 3 miles southwest of the intersection of I-25 and SH 119 on Boulder Creek (NDIS 2006).

Bald eagle foraging habitat in the regional study area is shown in Figure 3. Prairie dog colonies and open water such as lakes and reservoirs are important foraging habitat for bald eagles in the regional study area, especially when located within 3 miles of a bald eagle nest or winter night roost.

Wildlife Species of Concern

This section describes wildlife species that are known to occur or have the potential to occur in the project area and although not federally listed, have been listed as species of special concern by the CDOW, or have been described as rare, vulnerable, or imperiled in the state by the CNHP. Wildlife species of concern with the potential to occur in or near the project area and their state status are presented below (Table 5 and Table 6).

Table 5. State Threatened, Endangered, and Species of Concern Potentially Occurring in the Project Area.

Common Name	Scientific Name	Status*	Habitat	Potential to Occur in Project Area
Mammals				
Black-tailed prairie dog	*Cynomys ludovicianus*	SC	Open space and vacant land throughout project area	Known to occur
Swift fox	*Vulpes velox*	SC	Shortgrass prairie, generally east of I-25 in Larimer and Weld counties	Potentially occurs
Townsend's big-eared bat	*Plecotus townsendii*	SC	Caves and mineshafts, urban areas, riparian areas	Potentially occurs
Birds				
Plains sharp-tailed grouse	*Tympanuchus phasianellus jamesii*	SE	Grasslands and scrublands	Unlikely to occur
Western burrowing owl	*Athene cunicularia*	ST	Potentially occurs in prairie dog colonies	Known to occur
Mountain plover	*Charadrius montanus*	SC	Shortgrass prairie	Unlikely to occur
Ferruginous hawk	*Buteo regalis*	SC	May forage in prairie dog towns in winter	Likely to occur
American peregrine falcon	*Falco Peregrinus*	SC	Cliffs and surrounding areas	Unlikely to occur
Great blue heron	*Ardea herodius*	None	Nests in colonies in groves of trees on major rivers and reservoirs; forages in all aquatic habitats	Known to occur
Reptiles/Amphibians				
Common gartersnake	*Thamnophis sirtalis*	SC	Streams, ditches, and ponds; known to occur on major drainages in the project area	Known to occur
Midget faded rattlesnake	*Crotalus viridis concolor*	SC	Occurs in grasslands in western Colorado	Unlikely to occur
Northern leopard frog	*Rana pipiens*	SC	Steams, lakes, ponds, marshes, and wet meadows	Known to occur
Fish				
Common shiner	*Notropis cornutus*	SE	St. Vrain Creek and South Platte River	Known to occur
Plains minnow	*Hybognathus placitus*	SE	Cache la Poudre River, two records from 1996 (CDOW 2005b)	Unlikely to occur
Brassy minnow	*Hybognathus hankinsoni*	ST	Cache la Poudre River, Fossil Creek, St. Vrain River, and South Platte River	Known to occur
Iowa darter	*Etheostoma exile*	SC	Cache la Poudre River, Big Thompson River, and St. Vrain River	Known to occur

Common Name	Scientific Name	Status*	Habitat	Potential to Occur in Project Area
Stonecat	*Noturus flavus*	SC	St. Vrain River	Known to occur
Invertebrates				
Cylindrical papershell	*Anodontoides ferussacianus*	SC	Mud and sand in small creeks	Potentially occurs

*Key to CDOW species ranking system:

SE: State Endangered. Those species or subspecies of native wildlife whose prospects for survival or recruitment within this state are in jeopardy, as determined by the Commission.

ST: State Threatened. Those species or subspecies of native wildlife which, as determined by the Commission, are not in immediate jeopardy of extinction but are vulnerable because they exist in such small numbers, are so extremely restricted in their range, or are experiencing such low recruitment or survival that they may become extinct.

SC: Special Concern. Those species or subspecies of native wildlife that have been removed from the state threatened or endangered list within the last 5 years; are proposed for federal listing (or are a federal listing "candidate species") and are not already state-listed; have experienced, based on the best available data, a downward trend in numbers or distribution lasting at least 5 years that may lead to an endangered or threatened status; or are otherwise determined to be vulnerable in Colorado.

Sources: CDOW 2005b; NDIS 2006.

During discussions with CDOW, it was determined that several species in Table 5 are unlikely to occur in the project area (Sherman, pers. comm. 2006). Plains sharp-tail grouse, mountain plover, and American peregrine falcon are not addressed further in this report because they are unlikely to occur due to lack of suitable habitat, or because the project area is outside the known range of these species. Although great blue heron is not listed as a species of concern by either CDOW or CNHP, it was added to the list of species to be reviewed at the request of CDOW (Sherman, pers. comm. 2006). CDOW species of concern are not protected by statute, but are rare and thus are typically addressed in any EIS prepared for proposed transportation projects. While CDOW species of concern are not protected by statute, CDOT is committed to their conservation.

Table 6. CNHP listed rare and imperiled wildlife species potentially occurring in the project area.

Common Name	Scientific Name	Status*	Habitat	Potential to Occur in Project Area
Birds				
Black-necked stilt	*Himantopus mexicanus*	S3	Margins of lakes and ponds, and marshy areas	Unlikely to occur
Invertebrates				
Stonefly	*Mesocapnia frisoni*	S1	Low-elevation streams in the southern Rocky Mountains with minimal siltation	Known to occur in Little Thompson River
Sandhill fritillary	*Boloria selene sbulocollis*	S1S2	Wet meadows, bogs, and marshes	Unlikely to occur
Arogos skipper	*Atrytone arogos*	S2	Undisturbed grasslands and prairies	Unlikely to occur
Ottoe skipper	*Hesperia ottoe*	S2	Tallgrass prairie in the foothills	Unlikely to occur
Dusted skipper	*Atrytonopsis hianna*	S2	Tallgrass prairie in the foothills	Unlikely to occur
Two-spotted skipper	*Euphyes bimacula*	S2	Marshes, bogs, and wet meadows	Unlikely to occur
Moss' elfin	*Callophrys mossii schryveri*	S2S3	Rocky outcrops and cliffs	Unlikely to occur
Rhesus skipper	*Polites rhesus*	S2S3	Shortgrass and mixed grass prairie in the foothills	Unlikely to occur
Cross-line skipper	*Polites origenes*	S3	Foothills areas	Unlikely to occur
Modest sphinx moth	*Pachysphinx modesta*	S3	Riparian habitats and moist mountainsides	Unlikely to occur

*Key to CNHP imperilment ranks for Colorado:
S1: Critically imperiled statewide because of rarity (5 or fewer occurrences in the world/state; or 1,000 or fewer individuals), or because some factor of its biology makes it especially vulnerable to extinction.
S2: Imperiled statewide because of rarity (6 to 20 occurrences, or 1,000 to 3,000 individuals), or because other factors demonstrably make it very vulnerable to extinction throughout its range.
S3: Vulnerable throughout its range or found locally in a restricted range (21 to 100 occurrences, or 3,000 to 10,000 individuals).
S4: Apparently secure statewide, though it may be quite rare in parts of its range, especially at the periphery. Usually more than 100 occurrences and 10,000 individuals.
Source: CNHP 2005.

While CNHP imperiled species are not protected by statute, CDOT is committed to their conservation.

Mammals

Black-tailed prairie dog

The black-tailed prairie dog is a state species of special concern and was, until recently, a federal candidate species for listing as threatened according to the ESA (69 FR 15951217 [August 18, 2004]). Prairie dogs are important components of the shortgrass and mesic grasslands systems. They are commonly considered a "keystone" species because their activities (burrowing and intense grazing) provide food and shelter for many other grassland species, and have a large effect on community structure and ecosystem function (Power et al. 1996). Prairie dogs help provide habitat for other species by creating an environment that is inviting to other animals. Species such as black-footed ferret, burrowing owl, prairie rattlesnake, and mountain plover are closely linked to prairie dog burrow systems for food and/or cover. Prairie dogs provide an important prey resource for numerous predators including American badger, coyote, red fox, bald eagle, golden eagle, ferruginous hawk, and other raptors.

Typically, areas occupied by prairie dogs have greater cover and abundance of perennial grasses and annual forbs compared to nonoccupied sites (Whicker and Detling 1988; Witmer et al. 2000). Prairie dogs can contribute to overall landscape heterogeneity, affect nutrient cycling, and provide nest sites and shelter for wildlife such as rattlesnakes and burrowing owls (Whicker and Detling 1988). Prairie dogs also can denude the surface by clipping above-ground vegetation and contributing to exposed bare ground by digging up roots (Smith 1967).

Prairie dogs are found in agricultural and vacant lands throughout the project area. Figure 4, Figure 5, and Figure 6 show the location of prairie dog colonies in the project area. Prairie dog colonies cover approximately 717 acres within ½ mile of the centerline of I-25 in the project area and 609 acres within ½ mile of the proposed commuter rail alignment.

Figure 4. Wildlife Habitat, North I-25 EIS Regional Study Area – Northern Region.

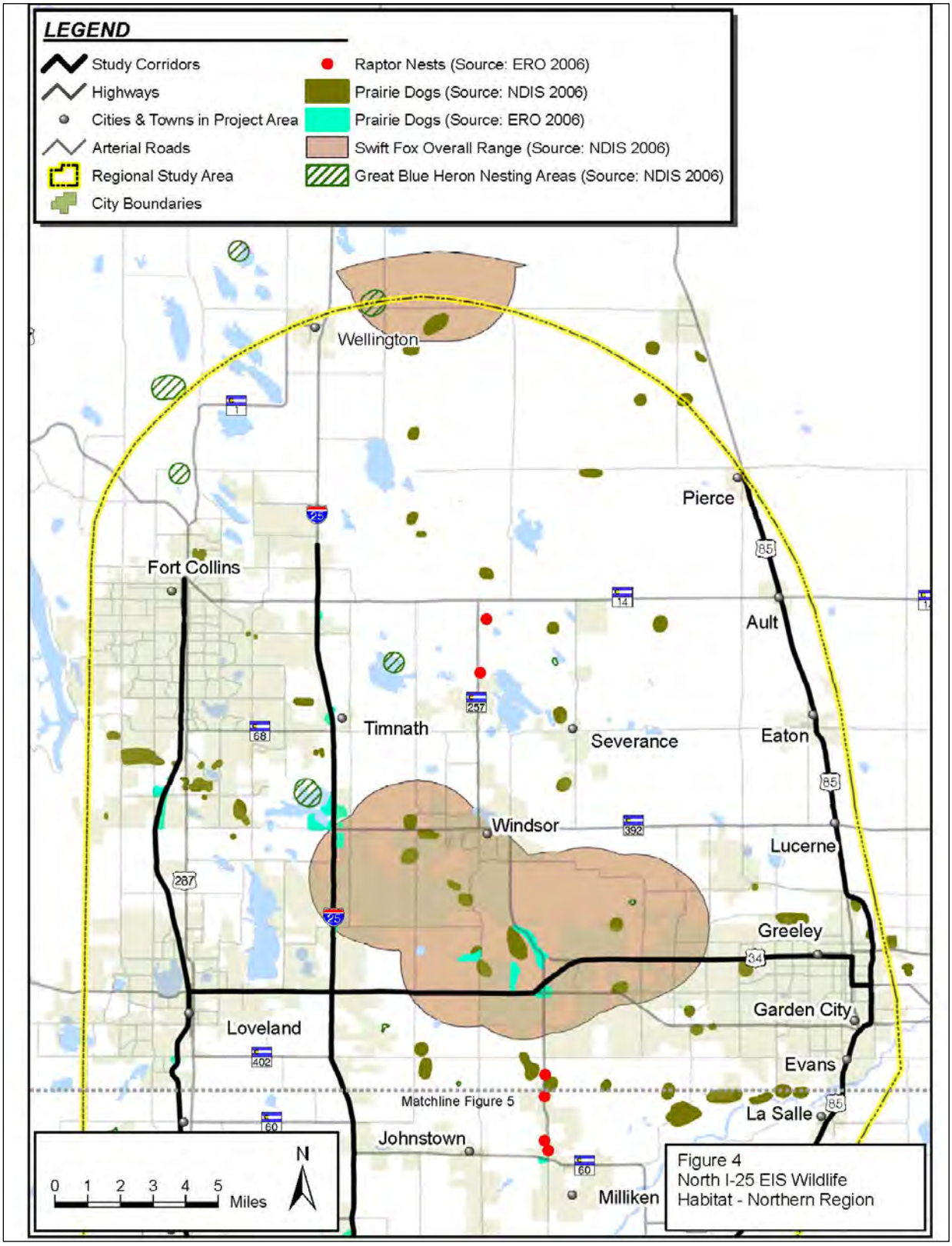


Figure 5. Wildlife Habitat, North I-25 EIS Regional Study Area – Central Region.

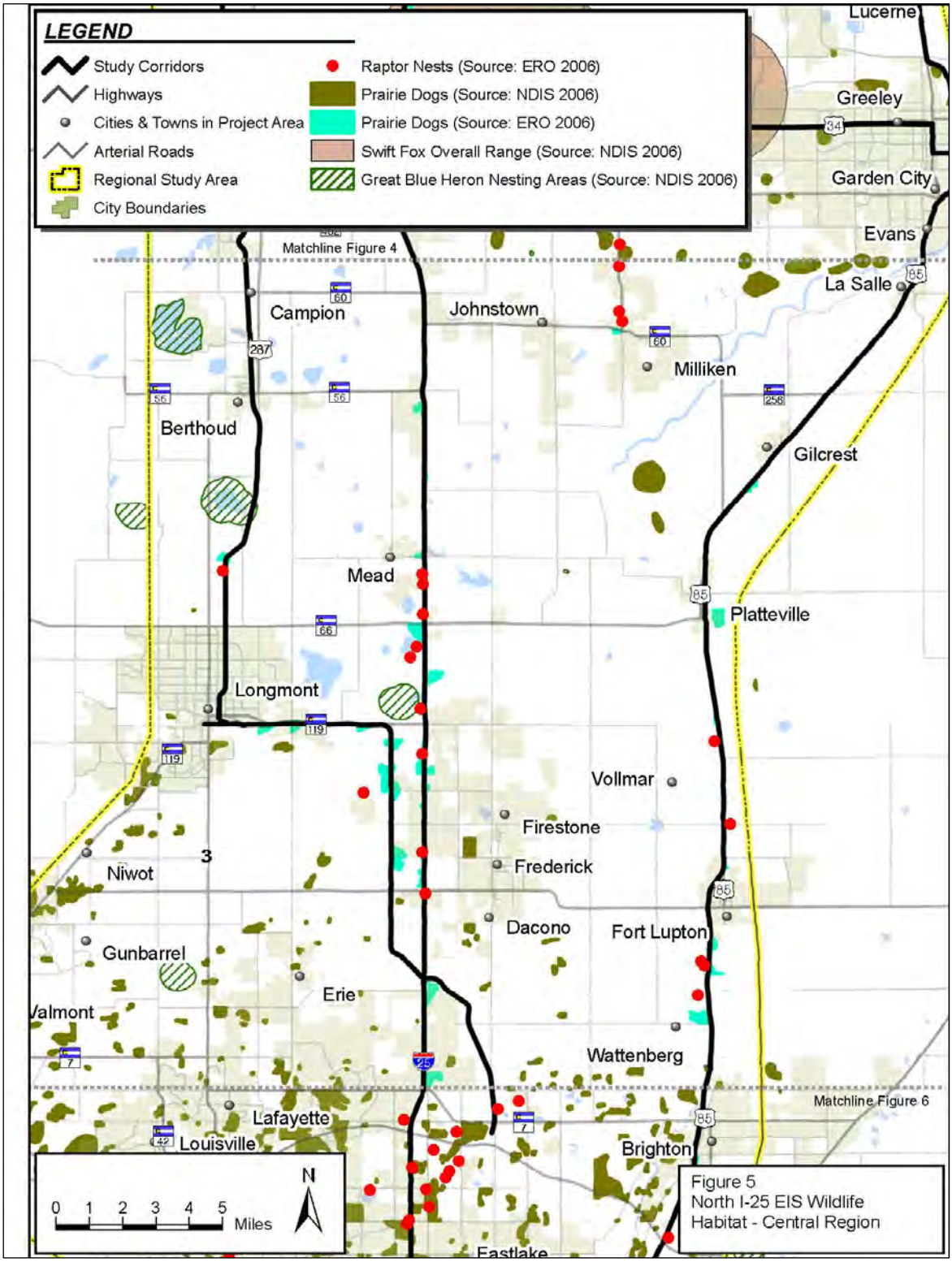
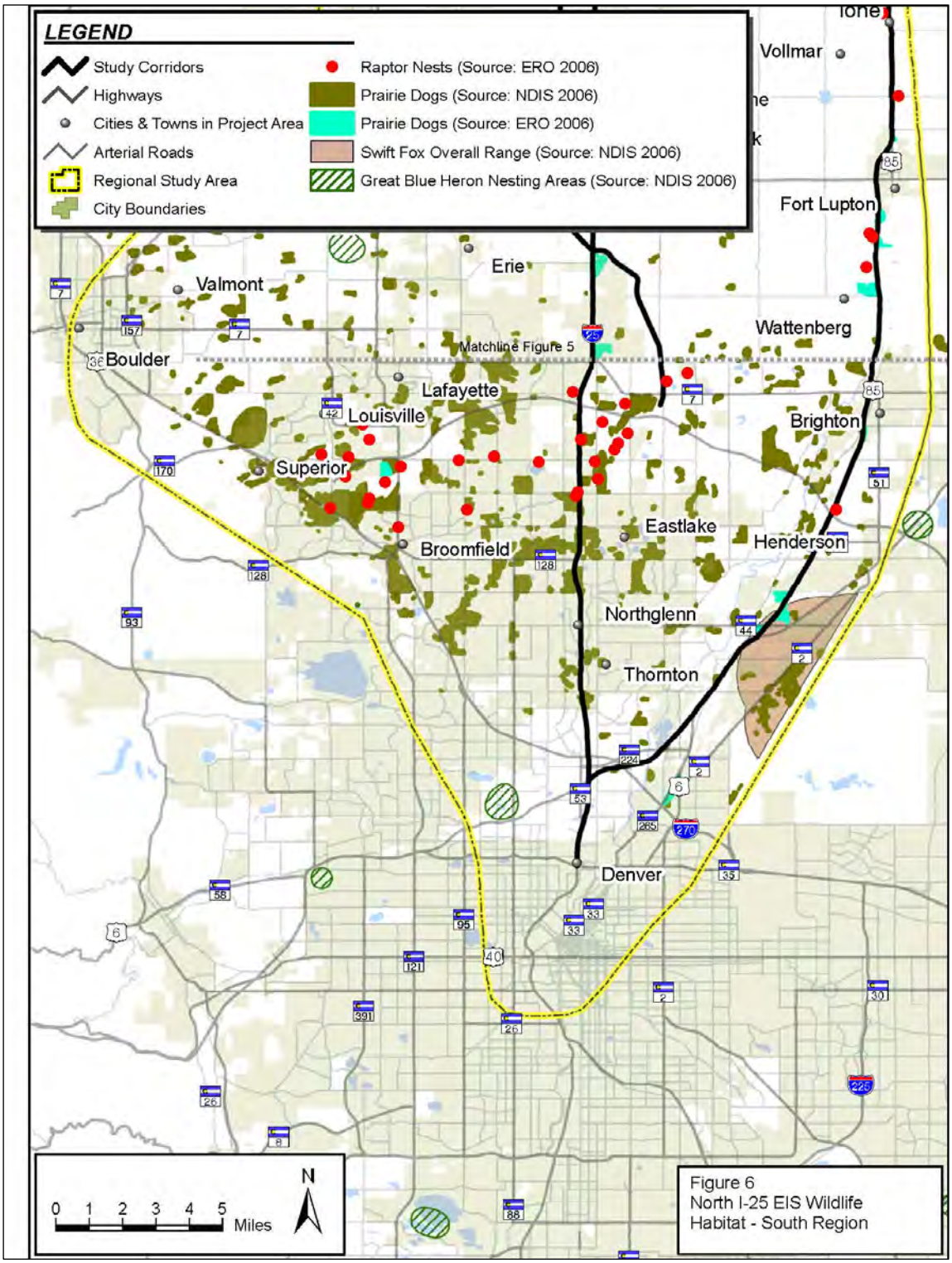


Figure 6. Wildlife Habitat, North I-25 EIS Regional Study Area – Southern Region.



Swift fox

The swift fox is a state species of special concern. The distribution of the swift fox includes the grasslands of eastern Colorado (Fitzgerald et al. 1994). Dens are usually located on sites dominated by native shortgrass prairie species such as blue grama and buffalograss. They are sometimes associated with prairie dog towns although they generally excavate their own dens (Fitzgerald et al. 1994).

An area generally north of Highway 34 and east of I-25 has been mapped by CDOW as being within overall swift fox range (NDIS 2006). Overall swift fox range is shown in Figure 4, Figure 5, and Figure 6. The swift fox is unlikely to occur in other portions of the project area.

Townsend's big-eared bat

The Townsend's big-eared bat is a state species of special concern that uses a variety of habitats including coniferous forest, desert shrublands, and piñon-juniper woodlands (Fitzgerald et al. 1994). Townsend's big-eared bats are year-round residents in Colorado that forage primarily for insects over water or along the margins of vegetation (Fitzgerald et al. 1994). These bats are relatively sedentary and do not migrate long distances (Harvey et al. 1999). They use caves and abandoned mines for roosts and hibernation. Townsend's big eared bats return to the same roost sites year after year (Harvey et al. 1999). Hibernation sites with appropriate temperature and humidity are important for these bats, and they are susceptible to die-offs or winter roost abandonment if disturbed by humans (Fitzgerald et al. 1994). Colorado Gap analysis data shows Townsend's big-eared bat habitat as occurring in forested foothills, urban areas, and riparian forests (CDOW 2001).

CDOW lists Townsend's big-eared bat as uncommon in Boulder and Larimer counties (NDIS 2006). This species has been documented in Fort Collins just east of the project area (CNHP 2005), and has the potential to occur in urban areas and riparian forests in the project area.

Birds

Western burrowing owl

The western burrowing owl is a small migratory owl that occupies prairie dog colonies in Colorado during the summer breeding season. The burrowing owl has been listed as threatened by the CDOW and is protected under the MBTA. The owl is active during the day and uses abandoned prairie dog burrows for nesting and roosting (Jones 1998 *in* Kingery).

Burrowing owls are typically present in Colorado between March 1 and October 31 (Craig 2002).

CDOW lists the burrowing owl as fairly common in Larimer and Weld counties, uncommon in Adams County, and rare in Boulder County (NDIS 2006). Burrowing owls are known to nest in Adams, Larimer, and Weld counties, including near the project area (Jones 1998 *in* Kingery). This species is known to occur in a prairie dog town located in the area of one of the proposed transit stations adjacent to the existing park and ride lot on U.S. 34 at SH 257. Burrowing owls have the potential to occur in any prairie dog town in the project area, especially prairie dog towns that are isolated from human disturbance.

Ferruginous hawk

The ferruginous hawk is the largest hawk in North America and is a state species of special concern. This species inhabits open prairie and desert habitats and is strongly associated with primary prey species such as ground squirrels, rabbits, and prairie dogs (Jasikoff 1982). Ferruginous hawks are relatively common winter residents in eastern Colorado, particularly in association with the black-tailed prairie dog (Beane 1996). Ferruginous hawks are rare to uncommon residents on the eastern plains of Colorado in the summer (Andrews and Righter 1992).

CDOW lists the ferruginous hawk as rare in Larimer Country and uncommon in Adams and Weld counties (NDIS 2006). This species has been known to breed in scattered locations in eastern Colorado, but not in the project area (Preston *in* Kingery 1998). Ferruginous hawks are likely to occasionally forage within the project area, especially in prairie dog towns in winter.

Black-necked stilt

The black-necked stilt is a wading bird that inhabits the margins of lakes, ponds, marshes, and flooded grassy areas (Winternitz *in* Kingery 1998). Black-necked stilts are often found associated with American avocets and the two species may nest in mixed colonies (Winternitz *in* Kingery 1998).

The black-necked stilt is a rare spring and fall migrant on the eastern plains of Colorado and occurs casually in northeastern Colorado during the breeding season (Andrews and Righter 1992). Black-necked stilts have been confirmed to breed at a few locations in northeastern Colorado including locations in Boulder, Larimer, and Weld counties, including Fort Collins in Larimer County (Andrews and Righter 1992; Winternitz *in* Kingery 1998). CDOW lists the

black-necked stilt as rare in Larimer County, with abundance unknown in Adams, Boulder, and Weld counties (NDIS 2006). This species is unlikely to occur in the project area due to limited suitable habitat.

Great blue heron

The great blue heron is a large, colonial nesting waterbird that inhabits reservoirs and rivers. Breeding colonies occur in groves of live or dead trees standing in or near reservoirs and rivers (CNDIS 2006). Great blue herons nest in close, congested communities called rookeries. They breed in Colorado from mid-March to August, and return to the same nest every year. This species has an extended nesting period that spans nearly 5 months from late March through July (Dexter *in* Kingery 1998), and potential disturbance to rookeries should be minimized during this critical breeding period. Double-crested cormorants (*Phalcrocorax auritus*) often nest in the same rookeries with great blue herons.

Great blue herons are protected under the MBTA; however, there are no official guidelines for buffers around great blue heron nests within Colorado. CDOW maps great blue heron nesting areas with a 500-meter (0.31 mile) buffer (NDIS 2006). Land use in the area around Fossil Creek Reservoir is guided by the policies and principles presented in the Fossil Creek Reservoir Area Plan (Fossil Creek Plan) adopted in 1998, amended in 1999, and amended again in 2000 (City of Fort Collins and Larimer County 1998).

The Fossil Creek Plan establishes a recommended buffer of 250 meters (825 feet) around colonial nesting sites for great blue herons and black-crowned night herons.

Other states have recommended permanent, year-round minimum protection areas (buffers) of 250 to 300 meters (820 to 984 feet) from the peripheries of colonies, with all human activities that are likely to cause colony abandonment being restricted in this buffer year-round (Quinn and Milner 2004). It has also been recommended that activities such as construction should not occur within 1,000 meters (3,281 feet) around a colony during the breeding season (Quinn and Milner 2004).

Great blue heron rookeries occurring in the regional study area are shown in Figure 4, Figure 5, and Figure 6. Three great blue heron rookeries occur near proposed I-25 improvements or near the proposed commuter rail alignment including: Fossil Creek Reservoir on the Big Thompson River about ½ mile west of I-25, St. Vrain Creek just west of I-25 at St. Vrain State Park, and Ish Reservoir just east of U.S. 287 (NDIS 2006). The rookery at St.

Vrain State Park is also the largest breeding site for great egrets (*Ardea alba*) in Colorado (Huwer, pers. comm. 2006).

Reptiles and Amphibians

Common gartersnake

The common gartersnake is listed as a state species of special concern. The subspecies that occurs in Colorado has black and red sides with a pale yellow to white stripe down the center of the back. In Colorado, this species is found from northern Jefferson County and southern Boulder County northeast to Nebraska and Wyoming (Hammerson 1999). The common gartersnake inhabits the margins of streams, irrigation ditches, natural and artificial ponds, as well as open areas.

The CDOW lists the common gartersnake as sparsely common in Boulder County and uncommon in Adams, Larimer, and Weld counties (NDIS 2006). In the project area, the common gartersnake is known to occur in riparian habitat in the drainages of Big Dry Creek, St. Vrain River, Big Thompson River, South Platte River, and Cache la Poudre River (Hammerson 1999). Other perennial streams and ponds in the project area provide potential habitat for this species, and this species would be expected to occur in suitable habitat.

Midget faded rattlesnake

One of two subspecies of western rattlesnake occurring in Colorado, the midget faded rattlesnake, occurs primarily in west-central Colorado and is listed as a state species of special concern. Among the smallest of the western rattlesnake subspecies, its maximum total length rarely exceeds 26 inches. Although it seems to avoid perennially wet habitats, it occurs in a wide variety of terrestrial habitats including grasslands, sandhills, mountain and semidesert scrublands, sagebrush, riparian vegetation, piñon-juniper woodlands, and open coniferous forests (Hammerson 1999).

The midget faded rattlesnake occurs primarily in western Colorado; most rattlesnakes occurring in the project area belong to the more common western rattlesnake subspecies (*Crotalus viridis viridis*) rather than the midget faded rattlesnake subspecies (Hammerson 1999). This subspecies is unlikely to occur in the project area.

Northern leopard frog

The northern leopard frog prefers the banks and shallow portions of marshes, wet meadows, ponds, lakes, and streams particularly where rooted aquatic vegetation is present (Hammerson 1999). The northern leopard frog is listed as a species of special concern by CDOW. This species is wide-ranging, occurring at elevations up to 11,000 feet. Amphibian

populations have declined both worldwide and locally in Colorado, for reasons not well known. Additional threats to the northern leopard frog are thought to include habitat loss, predation by fish, and competition from the nonnative bullfrog (Hammerson 1999).

The sites in eastern Colorado where northern leopard frogs occur in greatest abundance are typically small, isolated reservoirs that have not been colonized by, or stocked with, bullfrogs or predatory fishes (Hammerson 1999). CDOW lists the northern leopard frog as locally common in Weld County and uncommon in Larimer and Boulder counties (NDIS 2006). Within the project area, northern leopard frogs have been documented in the Cache la Poudre, Big Thompson, St. Vrain, and South Platte river drainages (Hammerson 1999).

Fish

Common shiner

The common shiner is approximately 6 inches in length and is listed as a threatened species by CDOW. The common shiner inhabits streams of moderate gradient with cool, clear water, gravelly bottoms, and shady areas, and appears to be intolerant of silted habitats (Woodling 1985). Spawning occurs in early summer on gravel beds in flowing water (Baxter and Stone 1995). The type of habitat preferred by this species is not common in Colorado where silt and sediment affect most streams (Woodling 1985).

The common shiner is a native of the South Platte River Basin, and has been recorded near the project area in St. Vrain Creek at Hover Road, St. Vrain Creek at U.S. 287, St. Vrain Creek just upstream from confluence with Boulder Creek, the South Platte River at 31st Avenue, and Stearns Reservoir in Boulder County (CDOW 2005c).

Plains minnow

The plains minnow is native to Colorado, and is listed as endangered by CDOW. The preferred habitat of the plains minnow is main channels of streams with sandy bottoms and some current (Woodling 1985). It seems to prefer turbid water and is less common in clear streams (Baxter and Stone 1995). The spawning habitats of this species are not well known (Baxter and Stone 1995).

In eastern Colorado, the plains minnow has been collected from Washington, Yuma, and Kiowa counties (Woodling 1985). Near the project area, CDOW fish sampling studies in 1996 documented the plains minnow in the Cache la Poudre River near Fort Collins (CDOW 2005c); however, CDOW biologists have stated that this record is probably a misidentification

(Sherman, personal communication). This species is unlikely to occur in the regional study area or in the project area.

Brassy minnow

The brassy minnow is native to Colorado and is listed as threatened by CDOW. The brassy minnow occupies cool, clear streams with abundant aquatic vegetation and with a mud or gravel substrate (Woodling 1985; Baxter and Stone 1995). Spawning occurs in late May or when water temperatures are between 16ºC to 27ºC (Baxter and Stone 1995).

Past studies have found the brassy minnow in the South Platte River to be mainly restricted to portions of the mainstem river and most abundant in the eastern portion of the plains region (Probst 1982 *cited in* Woodling 1985). CDOW fish sampling studies between 1991 and 2002 recorded the brassy minnow near the project area in the Cache la Poudre River, Fossil Creek, St. Vrain River, and South Platte River (CDOW 2005c), and this species would be expected to occur in any stream in suitable habitat. The brassy minnow was found in St. Vrain Creek at Highway 119 during CDOW fish sampling studies in 2006 (Crockett, pers. comm. 2006).

Iowa darter

The Iowa darter is a small fish measuring less than 3 inches long, and is listed as a state species of special concern. The Iowa darter occurs in lakes with rooted aquatic vegetation and in streams with cool clear water, undercut banks, and vegetation extending from the bank into the water (Woodling 1985). Spawning occurs from late April to July (Baxter and Stone 1995). In Colorado, the species' distribution is generally limited to streams in northeastern Colorado and Elevenmile Reservoir in South Park, although they have been introduced to the upper Colorado River Basin (Woodling 1985).

Iowa darters have been recorded at a few locations near the project area including within the Cache la Poudre River, Big Thompson River, and St. Vrain Creek (CDOW 2005c). Threats to the Iowa darter include habitat degradation resulting from siltation, pollution, and bank destabilization; the effects of urbanization; and predation by nonnative fish.

Stonecat

The stonecat is a small native catfish that is listed as a state species of special concern. The stonecat lives in streams with strong currents and typically hides under rubble, rocks, woody debris, or along sandbars during the day (Woodling 1985; Baxter and Stone 1995). This species also nests beneath rubble in fast-moving currents in June and July (Baxter and Stone

1995). Eastern Colorado streams, which have low flows, silt, and frequent dewatering, are not ideal habitat for this species (Woodling 1985).

One specimen was collected from St. Vrain Creek near Longmont in 1984 (Woodling 1985). Near the project area, the stonecat has also been documented during CDOW surveys in 1994 in St. Vrain Creek at U.S. 287 and in St. Vrain Creek just upstream from the confluence with Boulder Creek (CDOW 2005c).

Invertebrates

Cylindrical papershell

The cylindrical papershell is a freshwater mussel that inhabits mud and sands of small creeks. The cylindrical papershell is considered imperiled (CNHP rank S2) in Colorado and is designated as a state species of concern by the CDOW (CNHP 2005; CDOW 2005b). This species is known to occur in Boulder County (CNHP 2005). The presence of this species in the project area is unknown.

Stonefly

Mesocapnia frisonii is a stonefly that is known to occur in relatively few low elevation streams near the southern Rocky Mountains of Utah, Colorado, and New Mexico, and from Kansas to Texas. The stonefly emerges in winter and spends its larval stage in sediments beneath and adjacent to creeks (CNHP 2005). It is likely that this species was formerly widely distributed in Colorado but has undergone a reduction in range due to urban and agricultural development (CNHP 2005).

In Colorado, this species is known to occur only in the Little Thompson River (CNHP 2005). In the project area, the stonefly is known to occur in the reach of the Little Thompson River that includes the crossing at U.S. 287 and the BNSF railroad (CNHP 2005).

Sandhill fritillary

The sandhill fritillary, a butterfly that is orange with black markings on the upperside and has rows of metallic silver spots on the underside of the wing, is considered imperiled to critically imperiled (CNHP rank S1S2) in Colorado (CNHP 2005). This species occurs in wet meadows, bogs, and marshes (Opler et al. 1995). The larvae of the sandhill fritillary feed on violets (*Viola* sp.), while adults feed on nectar from composite flowers (Opler et al. 1995).

The sandhill fritillary has been documented in Boulder and Larimer counties (Opler et al. 1995). The sandhill fritillary has not been documented in the project area, but was recorded

east of Fort Collins in 1978 (CNHP 2005). This species is unlikely to occur in the project area because suitable habitat is very limited.

Arogos skipper

This small butterfly is yellowish on the upperside and brown on the underside. The arogos skipper has declined throughout its range and is considered to be imperiled (CNHP rank S2) within Colorado (CNHP 2005). This species occurs in relatively undisturbed grasslands and prairies (Opler et al. 1995). The larvae feed on big bluestem and other grasses, while adults feed on nectar from native and introduced flowers (Opler et al. 1995).

The arogos skipper has been documented in Boulder and Larimer counties (Opler et al. 1995). Near the project area, the arogos skipper has been documented in grasslands south and west of Fort Collins, west of U.S. 287 (CNHP 2005). This species is unlikely to occur in the project area because suitable habitat is limited.

Ottoe skipper

This dull-colored butterfly occurs on the tallgrass prairie fragments along the foothills (Opler et al. 1995). The ottoe skipper has declined notably throughout its range and is considered imperiled (CNHP rank S2) within Colorado (CNHP 2005). The caterpillars feed on little bluestem and other grasses, while adults feed on nectar from native prairie wildflowers (Opler et al. 1995).

The ottoe skipper has been documented in Adams, Boulder, and Larimer counties (Opler et al. 1995). The ottoe skipper has been documented west of Fort Collins (CNHP 2005), but is unlikely to occur in the project area due to a lack of suitable habitat.

Dusted skipper

This butterfly is gray-black on the upperside and gray with white dusting on the underside. The dusted skipper is considered to be imperiled (CNHP rank S2) within Colorado (CNHP 2005). This species occurs in grasslands, prairies, barrens, and old fields (Opler et al. 1995). The caterpillars of this species feed on little bluestem and big bluestem (Opler et al. 1995).

The dusted skipper has been documented in Boulder and Larimer counties (Opler et al. 1995). Near the project area, the dusted skipper has been documented in grasslands south and west of Fort Collins, west of U.S. 287 (CNHP 2005). This species is unlikely to occur in the project area because suitable habitat is limited.

Two-spotted skipper

The two-spotted skipper is a small butterfly that inhabits marshes, bogs, wet streamsides, and wet sedge meadows (Opler et al. 1995). The two-spotted skipper is considered imperiled (CNHP rank S2) in Colorado (CNHP 2005). The caterpillars of this species feed on sedge (*Carex trichocarpa*), while adults feed on nectar from flowers (Opler et al. 1995).

The two-spotted skipper has been documented in Boulder, Larimer, and Weld counties (Opler et al. 1995). Near the project area, the two-spotted skipper was recorded in 1989 south of Fort Collins, east of U.S. 287 (CNHP 2005).

Moss' elfin

Moss' elfin is a small butterfly that is grayish brown to tan on the upperside and coppery brown to purplish brown on the underside. The Moss' elfin is considered to be vulnerable or imperiled (CNHP rank S2S3) in Colorado (CNHP 2005). This species occurs on rocky outcrops, woody canyons, and cliffs (Opler et al. 1995). The caterpillars of this species feed on stonecrop species in the Crassulacea family; the feeding habits of adults are not reported (Opler et al. 1995).

The Moss' elfin has been documented in Boulder and Larimer counties (Opler et al. 2005). The Moss' elfin is known to occur near the project area from a single record in Fort Collins (CNHP 2005).

Rhesus skipper

This small butterfly is dark brown on the upperside and greenish brown with dark spots on the underside. The rhesus skipper is considered vulnerable to imperiled (CNHP rank S2S3) in Colorado (CNHP 2005). This species occurs in native shortgrass and mixed-grass prairie (Opler et al. 1995). The larvae of this species feed on blue grama, a native prairie grass, while adults feed on nectar from flowers including Drummond's milkvetch (*Astragalus drummondii*) (Opler et al. 1995).

The rhesus skipper has been documented in Adams, Boulder, Denver, Larimer, and Weld counties (Opler et al. 1995). Near the project area, the rhesus skipper was documented in 1993 from a site in the foothills west of Fort Collins (CNHP 2005).

Cross-line skipper

This small butterfly is bright brownish orange on the upperside and yellowish orange on the underside. The cross-line skipper has declined throughout its range and is considered to be vulnerable (CNHP rank S3) within Colorado (CNHP 2005). This species occurs in native

tallgrass prairies (Opler et al. 1995). The larvae feed on little bluestem and other grasses, while adults feed on nectar from white, pink, or purple flowers (Opler et al. 1995).

The cross-line skipper has been documented in Adams, Boulder, and Larimer counties (Opler et al. 1995). Near the project area, the cross-line skipper has been documented in grasslands northwest of Fort Collins (CNHP 2005).

Modest sphinx moth

The modest sphinx moth is considered vulnerable (CNHP rank S3) in Colorado (CNHP 2005). This species inhabits riparian habitats and moist mountainsides (Opler et al. 1995). The caterpillars of this species feed on poplar, aspen, cottonwood, and willow, while adults do not feed (Opler et al. 1995).

The modest sphinx moth has been documented in Boulder and Larimer counties (Opler et al. 1995). The modest sphinx moth was recorded in 1989 near the project area, south of Fort Collins and east of U.S. 287 (CNHP 2005).

Terrestrial Wildlife

The project area is located along the base of the eastern foothills of the Rocky Mountains in the Great Plains ecosystem. The quality and connectivity of wildlife habitat in the project area is supported by the expanses of protected open space or otherwise undeveloped land, which preserves several habitat types, as well as movement corridors between different habitat areas. The following subsections describe big game, birds, reptiles, amphibians, and aquatic species that are not considered to be "species of special concern" by the CDOW or the CNHP, but that that could be affected by the proposed project. A list of wildlife species (birds, mammals, reptiles, and amphibians) known to occur in Adams, Broomfield, Boulder, Denver, Larimer, and Weld counties is located in Appendix B.

Big Game

Big game species occurring in the project area include American elk (*Cervus elaphus*), mule deer (*Odocoileus hemionus)*, and white-tailed deer (*Odocoileus virginianus*). The general distribution of each species and their occurrence in the project area are described below. Definitions of big game habitat categories are provided in Table 7.

American elk

Elk occur in semi-open forests or forest edges adjacent to parks and meadows. In Colorado, elk range across the western two-thirds of the state, generally below 6,000 feet in elevation. American elk overall range extends east to I-25 in the area north of Highway 60 and south of Highway 392 (NDIS 2006). This is the area located generally south and east of Loveland, including the area surrounding Boyd Lake. All elk winter range, winter concentration areas, severe winter range, summer concentration areas, and migration corridors, as mapped by CDOW, are located more than 5 miles west of the project area (NDIS 2006).

A section of the proposed commuter rail line from Loveland south to the Boulder/Larimer County line (approximately 10 miles) is mapped as within overall elk range. East-west movement of individuals through the project area typically occurs along riparian corridors, but may also occur in open grassland areas. Elk are known to occasionally move through the project area along the Big Thompson River corridor at the proposed commuter rail alignment (Huwer, pers. comm. 2006).

Mule deer

Although most commonly found in upland or riparian shrublands, mule deer are common throughout the project area, and are known to occur within almost all available habitat types including open grasslands. Mule deer summer range is generally located east of I-25 and west of the proposed commuter rail alignment (NDIS 2006). Mule deer winter range occurs in the foothills west of the project area and in the floodplains of the South Platte, St. Vrain, Big Thompson, and Cache la Poudre rivers, east of I-25 (NDIS 2006). The South Platte, St. Vrain, Big Thompson, and Cache la Poudre rivers also provide severe winter range for mule deer east of I-25 (NDIS 2006). Mule deer movement corridors in the project area occur along the Cache la Poudre, Big Thompson, and Little Thompson rivers, and St. Vrain Creek (Vierra, pers. comm. 2006; Huwer, pers. comm. 2006). The area around Ish Reservoir is also a movement corridor for mule deer (Huwer, pers. comm. 2006).

White-tailed deer

White-tailed deer are less common than mule deer, and are known to occur along plains riparian corridors, especially when riparian corridors are close to irrigated agricultural lands (NDIS 2006). White-tailed deer concentration areas occur along the South Platte, St. Vrain, Little Thompson, Big Thompson, and Cache la Poudre rivers (NDIS 2006). White-tailed deer movement corridors in the project area occur along the Cache la Poudre, Big Thompson, and Little Thompson rivers, and St. Vrain Creek (Vierra, pers. comm. 2006; Huwer, pers. comm. 2006). The area around Ish Reservoir is also a movement corridor for white-tailed deer (Huwer, pers. comm. 2006).

Table 7. Deer and elk habitat categories.

Habitat Category	Definition
American elk overall range	The area which encompasses all known seasonal activity areas within the observed range of an elk population.
American elk summer concentration area	Those areas where elk concentrate from mid-June through mid-August.
American elk migration corridors	A subjective indication of the general direction of the movments of migratory ungulate herds.
Mule deer year-round range	The area where mule deer commonly occur during all seasons.
Mule deer summer range	That part of the range where 90 percent of the individuals are located between spring green up and the first heavy snowfall. Summer range is not necessarily exclusive of winter range; in some areas winter range and summer range may overlap.
Winter range (American elk and mule deer)	That part of the overall range of a species where 90 percent of the individuals are located during the average 5 winters out of 10 from the first heavy snowfall to spring green up, or during a site-specific period of winter as defined for each DAU.*
Winter concentration area (American elk and mule deer)	That part of the winter range where densities are at least 200 percent greater than the surrounding winter range density during the same period used to define winter range in the average 5 winters out of 10.
Severe winter range (American elk and mule deer)	That part of the overall range where 90 percent of the individuals are located when the annual snowpack is at its maximum and/or temperatures are at a minimum in the 2 worst winters out of 10.
White-tailed deer concentration area	Concentration areas are defined as corridors of riparian habitat along river or stream courses that support higher populations of white-tailed deer, serve as travel corridors, and are considered critical habitat for white-tailed deer.
*A Data Analysis Unit (DAU) is an area in which a herd spends most of its time. DAUs are used to set population objectives for big game species in Colorado. Source: CDOW 2005d.	

Other Mammals

Carnivores common in and near the project area include the coyote (*Canis latrans),* raccoon (*Procyon lotor),* red fox (*Vulpes vulpes),* and striped skunk (*Mephitis mephitis).* These species are typically observed in open grasslands and close to riparian corridors. Mink (*Mustela vison*) are widespread in riparian habitats in Colorado and were observed within the project area. Black bear (*Ursus americanus)* and mountain lion (*Felis concolor)* may occasionally occur in the western portion of the project area, possibly along the proposed commuter rail alignment from Fort Collins south to Loveland (NDIS 2006). The project area is on the periphery of occupied range for both of these species (NDIS 2006). Mountain lions may occasionally move through the project area along the major drainages (Huwer, pers. comm. 2006).

A variety of small mammals are found in various habitat types in and near the project area. Grassland species include the white-tailed jackrabbit (*Lepus townsendii),* eastern cottontail (*Sylvilagus floridanus),* desert cottontail (*Sylvilagus audubonii),* and black-tailed prairie dog (*Cynomys ludovicianus).* Small mammals associated with riparian and wetland habitats include the meadow vole (*Microtus pennsylvanicus),* prairie vole (*Microtus ochrogaster*), and a variety of mice and shrews.

Birds

A wide variety of bird species use different habitat types in the project area for shelter, breeding, wintering, and foraging at various times during the year.

Raptors

Raptors commonly occurring in and near the project area include the red-tailed hawk (*Buteo jamaicensis),* great horned owl (*Bubo virginianus),* and American kestrel (*Falco sparverius).* Other raptors likely to occur near the project area include Cooper's hawk (*Accipiter cooperii),* Swainson's hawk (*Buteo swainsoni*), ferruginous hawk (*Buteo regalis),* northern harrier (*Circus cyaneus),* and rough-legged hawk (*Buteo lagopus)* (NDIS 2006). Burrowing owls potentially occur in prairie dog colonies throughout the project area. Ferruginous hawks and burrowing owls are discussed in greater detail under *Wildlife Species of Concern*. Raptor nests in and near the project area were mapped in April 2005 and April 2006 and are shown in Figure 4, Figure 5, and Figure 6. Most raptor nests observed were unoccupied. The occupied nests were most commonly occupied by red-tailed hawk, Swainson's hawk, or great horned owl.

Other migratory birds

The majority of the project area consists of mowed right-of-way, irrigated crops, and nonirrigated crops that are likely to provide habitat for birds such as the house sparrow, European starling, common grackle (*Quiscalus quiscula*), Canada goose (*Branta canadensis)*, house finch (*Carpodacus mexicanus*), mourning dove (*Zenaida macroura*), and rock dove (NDIS 2006). These species are also present in urban and suburban areas. The cliff swallow (*Petrochelidon pyrrhonota*) is abundant in the project area and frequently nests on manmade structures such as bridges and highway overpasses. Western kingbirds (*Tyrannus verticalis*) are common in riparian areas in the project area.

Common birds in native or uncultivated grasslands include the vesper sparrow (*Pooecetes gramineus)*, western meadowlark (*Sturnella neglecta)*, grasshopper sparrow (*Ammodramus savannarum)*, horned lark (*Eremophila alpestris*), and lark bunting (*Calamospiza melanocorys)* (NDIS 2006).

Wetland habitats typically support the red-winged blackbird (*Agelaius phoeniceus)*, song sparrow (*Melospiza melodia*), common yellowthroat (*Geothlypis trichas)*, and common snipe (*Gallinago gallinago)*, while riparian vegetation supports the northern oriole (*Icterus galbula)*, American goldfinch (*Carduelis tristis)*, yellow warbler (*Dendroica petechia)*, and American robin (*Turdus migratorius)*. Shorebirds such as the killdeer (*Charadrius vociferous*) and American avocet (*Recurvirostra americana*) are likely to be common along the lakes and ponds near the project area (NDIS 2006).

Open water bodies near the project area provide nesting and foraging habitat for a variety of waterfowl species such as the mallard (*Anas platyrhyncos)*, pintail (*Anas acuta bahamensis)*, and Canada goose (NDIS 2006). The American white pelican (*Pelecanus erythrorhynchos*) is a common summer resident on large reservoirs on the eastern plains. American white pelican foraging habitat includes sections of the Big Thompson, Little Thompson, and Cache la Poudre rivers in and near the project area (NDIS 2006).

A comprehensive list of bird species known to occur in the regional study area is found in Appendix B.

Reptiles and Amphibians

The diverse and relatively undisturbed habitats within the project area have the potential to support a wide variety of reptiles and amphibians. Common reptiles in grassland areas are likely to include the bullsnake (*Pituophis melanoleucus)*, yellow-bellied racer (*Coluber*

constrictor), and western rattlesnake. The plains gartersnake (*Thamnophis radix*) and western painted turtle (*Chrysemys picta bellii)* are common in wetland and open water habitats. Also, the lesser earless lizard *(Holbrookia maculata*) may be found in open grasslands such as prairie dog towns (Hammerson 1999; NDIS 2006). Snapping turtles (*Chelydra serpentia*) have also been documented to occur in the project area (Hammerson 1999). Two state species of special concern, the common gartersnake and the midget faded rattlesnake, may also be found in the project area and are addressed under *Wildlife Species of Concern* (NDIS 2006).

Amphibians likely to occur include the western chorus frog (*Pseudacris triserata),* bullfrog (*Rana catesbeiana),* Woodhouse's toad (*Bufo woodhousei),* plains spadefoot (*Spea bombifrons),* and tiger salamander (*Ambystoma tigrinum*). The northern leopard frog, a state species of special concern, may also occur in the project area (NDIS 2006) and is described under *Wildlife Species of Concern.*

Wildlife Crossing Areas and Movement Corridors

The existing lanes of I-25 already provide a substantial barrier to wildlife movements. Wildlife crossings typically occur near riparian corridors because riparian areas provide a natural movement pathway for wildlife and bridges and culverts often provide a way for wildlife to cross beneath the highway. Currently, the BNSF railway and the proposed commuter rail alignment are not major obstacles to wildlife movement due to the sporadic nature of fencing along the alignment, the small size of the fences (three strand barbed wire), and relatively low frequency of rail traffic.

Wildlife crossing areas and movement corridors were identified based on input from CDOW staff, review of road kill data collected by CDOT and the Colorado State Patrol (from 1993 to 2004), and field review (refer to Table 8 and Figure 7, Figure 8, and Figure 9). Additional data was opportunistically collected by CDOT maintenance crews from 2004 to 2007.

Table 8. Summary of wildlife crossing areas identified in the project area.

Wildlife Crossing Area	Wildlife Usage	Existing Structure
Cache la Poudre River at I-25	The section of I-25 from SH 14 south to SH 392 is used as a crossing area by deer and other wildlife, as shown by the relatively high number of wildlife collisions in this area, and as reported by CDOW staff (Vierra, pers. comm. 2006).	Multiple-span bridges northbound (NB) and southbound (SB). The existing bridges provide good passage for wildlife.
Fossil Creek at the BNSF alignment	No data is available for collisions at the railway, but a few collisions have been recorded on U.S. 287 near Fossil Creek, which is less than ½ mile downstream from the railway crossing.	Single-span bridge. The existing bridge over the creek appears to provide good crossing opportunities.
Big Thompson River at BNSF alignment	CDOW biologists indicated that the Big Thompson River in this area is a movement corridor for deer, elk, and other wildlife (Vierra, pers. comm. 2006; Huwer, pers. comm. 2006). Relatively few wildlife collisions have been documented at U.S. 287 near this location.	Multiple-span bridge. The existing bridge provides good passage for wildlife.
Big Thompson River at I-25	CDOW biologists indicated that the Big Thompson River in this area is a movement corridor for deer and other wildlife (Huwer, pers. comm. 2006). The section of I-25 extending about 3 miles north and south of the Big Thompson River is used as a crossing site by wildlife, as indicated by the relatively high number of wildlife collisions recorded in this area.	Multiple-span bridges (NB, SB, and service road). The existing bridges are adequately sized for deer and other wildlife.
Little Thompson River at BNSF alignment	The Little Thompson River is a movement corridor for deer and other wildlife (Huwer, pers. comm. 2006). Colorado State Patrol data shows that several collisions have been documented along U.S. 287 about 2 miles to the west.	Multiple-span bridge. The existing bridge is adequately sized for deer and other wildlife.
Little Thompson River at I-25	The Little Thompson River is a movement corridor for deer and other wildlife (Huwer, pers. comm. 2006). CSP data shows that several collisions have been documented along I-25 near the Little Thompson River.	Multiple-span bridges (NB, SB, and service road). The existing bridges are adequately sized for deer and other wildlife.
Ish Reservoir Area	CDOW biologists indicated that a deer crossing problem occurs along U.S. 287 west of Ish Reservoir (Huwer, pers. comm. 2006). CSP collision data indicates that deer, elk, and coyote have been killed crossing this section of U.S. 287. The BNSF rail alignment passes to the east of Ish Reservoir, about 1.5 miles to the east of U.S. 287. Wildlife crossings of the railway likely occur at a similar rate as U.S. 287.	No major structures, crossings occur at grade.
I-25 between Little Thompson River and St. Vrain Creek	CSP collision data shows that deer and other wildlife have been killed along the section of I-25 between the Little Thompson River and St. Vrain Creek. The land surrounding I-25 in this area is mostly open and agricultural, and wildlife are killed when attempting to cross at grade.	Concrete box culvert at North Creek, adequate for small- and medium-sized mammals; inadequate for deer and larger mammals.
St. Vrain Creek at SH 119	CDOW biologists reported that St. Vrain Creek serves as a movement corridor for deer and other wildlife (Huwer, pers. comm. 2006), and a broad, open area occurs at this location on both sides of SH 119 connecting undeveloped land along St. Vrain and Boulder creeks to St. Vrain State Park to the north and providing a natural movement corridor for wildlife.	Multiple-span bridge. The existing wildlife passage under SH 119 at St. Vrain Creek is undersized for deer due to low vertical clearance, but is large enough for small- and medium-sized mammals.

Wildlife Crossing Area	Wildlife Usage	Existing Structure
St. Vrain Creek at I-25	CDOW biologists reported that St. Vrain Creek serves as a movement corridor for deer and other wildlife (Huwer, pers. comm. 2006). CSP collision data shows that deer and other wildlife have been killed crossing I-25 near St. Vrain Creek. This crossing is used by deer, as indicated by tracks observed in the field.	Multiple-span bridge (NB, SB, and service road). The existing wildlife passage under I-25 is adequately sized for deer and other wildlife.
I-25 west of Firestone and Frederick	CSP collision data indicate that deer and other wildlife are occasionally killed along a 3-mile section of I-25 west of Firestone and Frederick. The surrounding area is mostly open and agricultural, and wildlife are killed when attempting to cross at grade.	No major structures.
Commuter rail alignment west of Firestone and Frederick	The rail alignment follows Weld County Road 7 about 1 mile west of I-25. No wildlife collision data is available for this area, but wildlife movements probably are similar to I-25 west of Firestone and Frederick, as described above.	No major structures.
Little Dry Creek at I-25	Field review indicated Little Dry Creek at I-25 could be a potential wildlife crossing area, but collision data indicates that only occasional collisions with wildlife occur in this area and CDOW did not identify Little Dry Creek as a movement corridor.	Concrete box culvert; adequately sized for small- and medium-sized mammals.
Little Dry Creek at Commuter Rail Alignment	Field review indicated Little Dry Creek at the commuter rail alignment could be a potential wildlife movement area, but no CSP data is available for this area and CDOW did not identify Little Dry Creek as a movement corridor.	None, but no existing rail line is present, so no movement barriers exist in this area.
Big Dry Creek at I-25	CSP collision data show a few collisions on I-25 near Big Dry Creek, but CDOW did not identify this area as a movement corridor.	Multiple-span bridge; the existing bridge is adequately sized for deer and other wildlife.

Figure 7. Roadkill and Wildlife Crossing Areas, North I-25 EIS Regional Study Area – Northern Region.

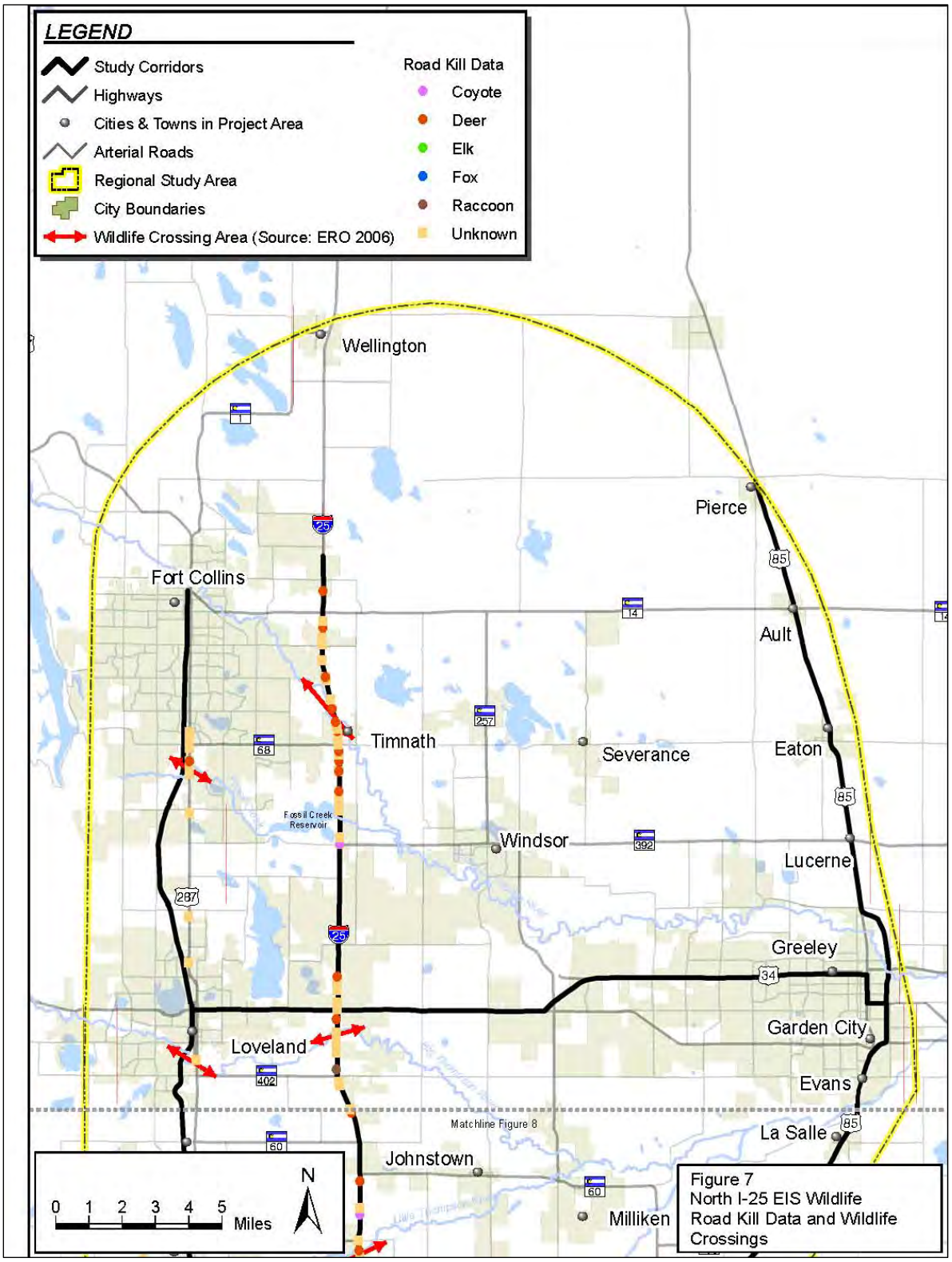


Figure 8. Roadkill and Wildlife Crossing Areas, North I-25 EIS Regional Study Area – Central Region.

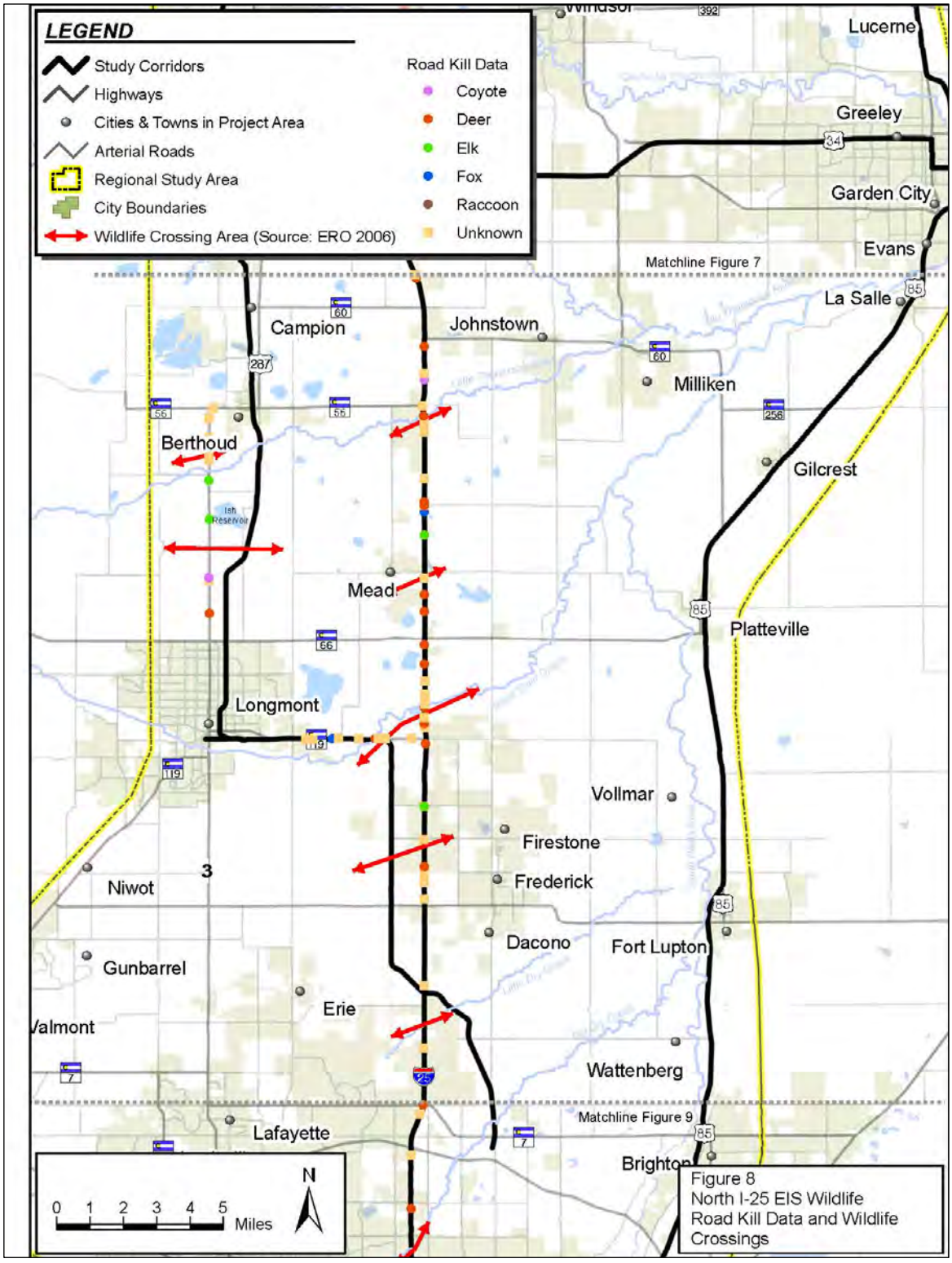
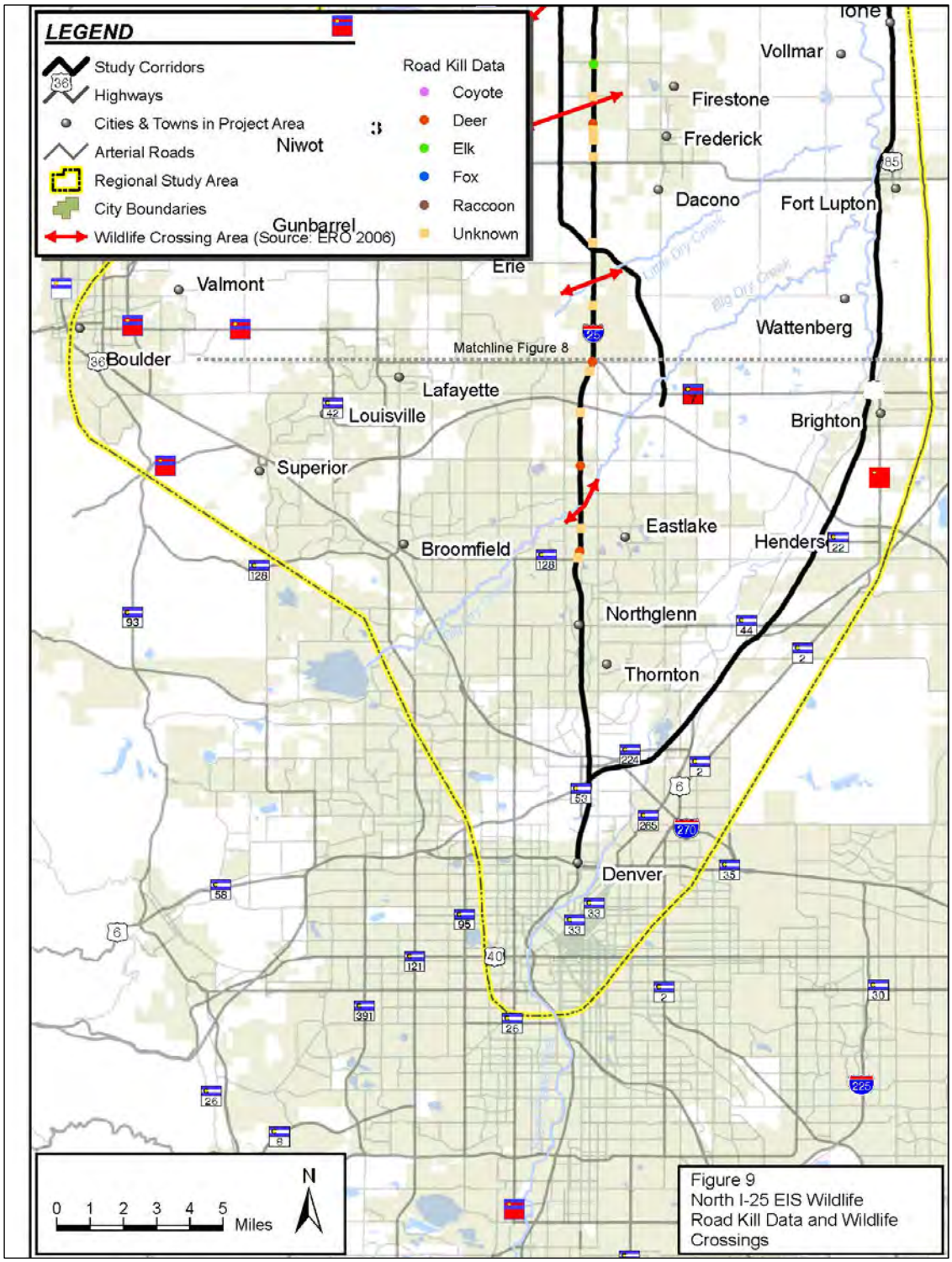


Figure 9. Roadkill and Wildlife Crossing Areas, North I-25 EIS Regional Study Area – Southern Region.



Sensitive Wildlife Habitat

Several sensitive wildlife habitat areas were identified during field work (Table 9). These areas were identified as sensitive wildlife habitat because:

- They are wildlife crossing areas;
- They provide known habitat for threatened, endangered, or sensitive species as defined by the USFWS or CDOW;
- They contain or are adjacent to protected lands such as designated open space, state parks, or state wildlife areas; or
- They provide habitat for numerous sensitive species.

Table 9. Sensitive wildlife habitats in the regional study area.

Sensitive Wildlife Habitat Area	Comments
Cache la Poudre River	Known occurrences of brassy minnow and Iowa darter; bald eagle winter concentration and summer forage; white-tailed deer winter range and concentration area; wildlife movement corridor
Fossil Creek Reservoir	Bald eagle winter roost occurs at reservoir
Big Thompson River	Possible occurrence of Preble's and Iowa darter; bald eagle winter concentration and summer forage; white-tailed deer winter range and concentration area; wildlife movement corridor; Big Thompson State Wildlife Area occurs just west of I-25
Little Thompson River	Possible occurrence of Preble's, bald eagle winter concentration and summer forage, white-tailed deer winter range and concentration area, wildlife movement corridor, CNHP Potential Conservation Area at U.S. 287
Ish Reservoir and surrounding area	Great blue heron rookery; wildlife crossing area at U.S. 287
St. Vrain Creek	Bald eagle winter roost west of I-25; bald eagle winter concentration and summer forage; known occurrences of common shiner, brassy minnow, Iowa darter, and stonecat; white-tailed deer winter range and concentration area; wildlife movement corridor; St. Vrain State Park occurs just west of I-25
South Platte River	Bald eagle winter concentration and summer forage, known occurrences of common shiner and brassy minnow, wildlife movement corridor
Sources: NDIS 2006; CNHP 2005; CDOW 2005c; USFWS 2005b.	

Aquatic Resources

The ditches, streams, and water bodies in the project area support a wide variety of aquatic insects, macroinvertebrates, and fish. Fish species documented in lakes, rivers, and streams in or near the project area are provided in Appendix C. Common fish species in creeks and streams in the project area include common carp (*Cyprinus carpio*), creek chub (*Semotilus atromaculatus*), fathead minnow (*Pimephales promelas*), Johnny darter (*Etheostoma nigrum*), longnose sucker (*Catostomus catostomus*), longnose dace (*Rhinichthys cataractae*), green sunfish (*Lepomis cyanellus*), and white sucker (*Catostomus commersoni*).

Several rare fish species (including the state endangered common shiner and brassy minnow, and state species of concern Iowa darter and stonecat), are known to occur in or near

the project area (CDOW 2005c). These sensitive species are addressed in greater detail under *Wildlife Species of Concern*.

Common aquatic insects include the larvae of the blackfly (*Simulium slossonae),* midge (*Chironomidae spp.),* mayfly (*Ephemeroptera*), and damselfly (suborder Zygoptera); caddisfly (*Spicipalpia* sp.); and cranefly (*Tipula oleraceae).* Snails, crayfish, and other macroinvertebrates occurring in aquatic environments in the project area provide an important source of prey for other fish, waterfowl, and mammal species.

The CNHP has designated a Potential Conservation Area (PCA) that includes the Little Thompson River at U.S. 287. This reach of the Little Thompson River provides habitat for a number of native fish and a variety of mayflies, caddisflies, and stoneflies compared with other Front Range streams (CNHP 2005). Six fish species including creek chub, longnose dace, fathead minnow, longnose sucker, white sucker and green sunfish were documented in the Little Thompson on May 22, 2001 (CNHP, 2005). Results of this survey are similar to those conducted by the Colorado Division of Wildlife in 1982 and 1997. All species captured are native and common in streams along the Front Range corridor. Additionally, only a few fish out of several hundred captured showed signs of parasites or infection, indicating a healthy community (CNHP, 2005). One species of stonefly (*Mesocapnia frisonii*) is not known to occur anywhere else in Colorado (CNHP 2005). This stonefly species is addressed in more detail under *Wildlife Species of Concern*.

Potential Effects of the Proposed Project

Federally Listed Threatened, Endangered, and Candidate Species

The proposed project would result in impacts to potential Preble's habitat. The black-footed ferret and Mexican spotted owl would not be affected by the proposed project because they do not occur in the project area. Effects to Platte River species in Nebraska (whooping crane, least tern, Eskimo curlew, piping plover, pallid sturgeon, or western prairie fringed orchid) due to depletions are not addressed because no depletions are expected as a result of the project. As currently proposed, the project would not result in depletions because:

1. Water quality ponds would be dry facilities and would release detained water within 40 hours; therefore, they would not result in discernable water loss via evaporation.

2. Water used for dust abatement would be obtained from municipal sources that have previously undergone depletions consultations.

3. Wetland mitigation would be at a 1:1 ratio; therefore, there would be no additional water loss via transpiration.

Preble's Meadow Jumping Mouse

Temporary disturbance to riparian habitat during bridge replacement would affect potential Preble's habitat near the Big Thompson and Little Thompson rivers at I-25. Direct effects to Preble's could include loss of habitat, mortality from crushing by construction equipment, or disruption of hibernation during winter. Any new street lights near bridges could increase susceptibility of Preble's to predation. Indirect effects could include increased habitat fragmentation and decreased use of the project area as a movement corridor due to increased width of the I-25 bridge crossings of the Big Thompson and Little Thompson rivers.

Other Federally Protected Species

Bald Eagle

Types of potential impacts to bald eagles include disturbance of nests, disturbance of winter night roosts, and loss of potential foraging habitat.

Current data indicate that no active nests occur within ½ mile of the project components as of the 2006/2007 breeding season; however, several bald eagle nests are known to occur near the project area. New breeding pairs of bald eagles could construct nests within ½ mile of the project area in the future, or a pair of eagles using one of the existing nests could relocate to a new nest closer to the project area. If construction activities occur within ½ mile of an active nest during the courting or breeding season, effects could include behavioral disturbance and potential nest abandonment.

The roost located at Fossil Creek Reservoir would not be adversely affected by the highway components because the proposed work in this area consists of upgrading an interchange and frontage roads, and because the roost is separated from the highway by existing and proposed development. New lighting at the intersection could either increase light pollution at the roost or, depending on design, could decrease affects of light on the roost. The roost area is already heavily impacted by light pollution and eagles have likely acclimated to the existing disturbance.

The Package A transit components could affect the bald eagle roost on St. Vrain Creek. The proposed rail alignment from Longmont to Denver would run parallel to SH 119 on the north side of the highway, crossing St. Vrain Creek via a new bridge north of SH 119. Although it is unlikely that bald eagles actually roost immediately adjacent to SH 119 (a busy highway), the loss of riparian habitat in this area would reduce the amount of available roosting

habitat further downstream. Bald eagle roosting areas change from year to year, and new roosting areas could become established or existing roosts could be abandoned by the time of construction, so effects described above should be considered representative of effects that could occur.

Bald eagles frequently forage in prairie dog colonies and riparian areas along major streams and rivers in the regional study area, especially in winter. Long-term impacts from road widening or other project components could include loss of foraging habitat or displacement of eagles from foraging habitat. For the purposes of determining impacts to bald eagles from loss of important foraging habitat, the most important foraging habitat is assumed to consist of prairie dog colonies or open water within 3 miles of a nest or communal winter night roost. No large bodies of open water such as lakes or reservoirs would be affected by the proposed project. Table 10 shows expected impacts to important bald eagle foraging habitat.

Table 10. Summary of effects to important bald eagle foraging habitat within 3 miles of nests and roosts.

Nest or Roost *within 3 miles of project area*	Prairie dogs within 3-mile buffer (acres)[1]	Open water within 3-mile buffer (acres)	Important foraging habitat within 3 miles (acres)[2]	Package A impacts to prairie dogs within 3-mile buffer[3]	Package B impacts to prairie dogs within 3-mile buffer[3]
Fossil Creek Reservoir/Timnath roost; Windsor nest	846	2,169	3,015	28	38
Longmont/St. Vrain nest; Delcamino/Boulder Creek nest; St. Vrain/Boulder Creek roosts	824	1,355	2,179	7.8	2.0
Berthoud nest	0	1,621	1,621	0	0
Thornton nest	1,956	424.	2,381	6.7	5.5
Total	**3,626**	**5,569**	**9,195**	**42**	**45**

[1]Prairie dogs mapped by CDOW 2002, not field verified.
[2]Prairie dogs (acres) + Open water (acres).
[3]Prairie dogs mapped by ERO in 2006. Impacts within project footprint.

Wildlife Species of Concern

Mammals

Black-tailed prairie dog

Prairie dogs occurring within the project area will need to be relocated, removed, or humanely euthanized according to CDOT's prairie dog policy (CDOT 2005). Implementation of CDOT's prairie dog policy will prevent black-tailed prairie dogs being crushed by machinery or buried in their burrows during construction. Prairie dogs could also be indirectly affected by loss of habitat within the highway right-of-way as a result of construction and by

habitat fragmentation. Some areas temporarily disturbed during construction would likely be recolonized by prairie dogs.

Swift fox

Direct effects to swift fox could include loss of foraging habitat and displacement during and after construction. Potential habitat for swift fox in the project area is low quality and is on the fringes of the occupied range for this species.

Townsend's big-eared bat

Direct effects to Townsend's big-eared bat could include loss of foraging habitat and potential displacement from foraging habitat during construction. No caves or mines that could provide roosting or hibernation sites would be affected.

Birds

Western burrowing owl

The proposed project would affect prairie dog colonies, which could indirectly affect burrowing owls because prairie dog colonies provide suitable nesting habitat for this species. No work will occur in prairie dog towns while burrowing owls are present, thus avoiding direct affects to burrowing owls. Work will either occur outside the time the owls are present in Colorado from March 1 to October 31 (Craig 2002), or prairie dog towns will be surveyed prior to construction to confirm that the owls are not present. No burrowing owls are known to nest within the project area.

Ferruginous hawk

Potential effects to ferruginous hawks include loss of winter foraging habitat during and after construction, especially if prairie dog colonies are affected. No ferruginous hawk nesting habitat would be disturbed.

Black-necked stilt

Potential impacts to the black-necked stilt are unlikely because this species is unlikely to occur in the project area.

Great blue heron

The Package A transit components could result in disturbance within the 500-meter (0.31 mile) buffer around a great blue heron nesting area at Ish Reservoir. The 0.31-mile buffer is based on recommendations by CDOW (NDIS 2006). No impacts are expected to occur within the buffers around other great blue heron nesting areas. No direct impacts to great blue heron nesting areas would occur. Great blue herons could be affected by loss of foraging habitat in wetland and riparian areas. Indirect effects include noise, light, and human encroachment

within this buffer during nesting season, which is approximately March 15 through July 31. Effects could include nest abandonment or reduced nesting success. Impacts to great blue heron foraging areas would be similar to impacts for other riparian and aquatic species.

Reptiles and Amphibians

Common gartersnake

The proposed project would affect habitat for common gartersnakes. This species could be affected by loss or fragmentation of riparian areas and wetlands as a result of construction. Direct effects could include mortality from being crushed by equipment during construction. Indirect effects include habitat fragmentation and reduced movement between habitat patches located on opposite sides of new or widened bridges or culverts. Indirect effects to this species could result from temporary declines in water quality from the proposed project.

Midget faded rattlesnake

Impacts to midget faded rattlesnake are unlikely because this species does not occur in the project area.

Northern leopard frog

The proposed project would affect habitat for northern leopard frogs. This species could be affected by loss or fragmentation of riparian areas and wetlands as a result of construction. Direct effects could include mortality from being crushed by equipment during construction. Indirect effects include habitat fragmentation and reduced movement between habitat patches located on opposite sides of new or widened bridges or culverts. Indirect effects to this species could result from temporary declines in water quality from the project.

Fish

Plains minnow

The plains minnow is unlikely to be affected by the proposed project because it does not occur in the project area.

Common shiner, brassy minnow, Iowa darter, and stonecat

The proposed project could affect habitat for state threatened, endangered, and sensitive fish species such as the common shiner, brassy minnow, Iowa darter, and stonecat. Potential adverse effects to these species during construction include temporary loss of habitat during construction of piers, bridges, culverts, and other work within streams. Increased erosion during construction could result in increased sediment loads, which would adversely affect sensitive aquatic species (Cordone and Kelley 1961). Working directly in streams could increase sediment loads, which could change water temperature. Working directly in streams

could also interfere with seasonal movements of sensitive fish species. These impacts would be short-term and would be mitigated through use of construction BMPs. Increases in traffic could result in increased contaminants in roadway runoff, deicer, and the risk of accidental spills of hazardous materials would increase, which could affect these species (Trombulak and Frissell 2000).

Construction of new water quality ponds could result in an indirect benefit to state threatened, endangered, and sensitive fish species by improving water quality in streams and water bodies downstream. Construction of new culverts or lengthening of existing culverts would adversely affect sensitive fish species by increasing shading or replacing natural streambed with concrete. Stream habitat could be improved through the replacement of existing culverts with more numerous culverts or free-spanning bridges. Removal or redesign of drops that act as barriers would also benefit sensitive fish species.

Invertebrates

Cylindrical papershell and stonefly

Types of potential impacts to aquatic invertebrates from the proposed project would be similar to impacts to sensitive fish species. Potential adverse effects to these species during construction could include temporary loss of habitat during construction of piers, bridges, culverts, and other work within streams. Increased erosion during construction could result in increased sediment loads, which would adversely affect sensitive aquatic species. Increases in traffic could result in increased contaminants in roadway runoff, including deicer, and would increase the risk of accidental spills of hazardous materials, which could affect these species.

Construction of new water quality ponds could result in an indirect benefit to state threatened, endangered, and sensitive aquatic invertebrates by improving water quality in streams and water bodies downstream.

Butterflies and moths

The sandhill fritillary, Argos skipper, Ottoe skipper, and dusted skipper would not be affected by the proposed project because they are unlikely to occur in the project area. Impacts to the two-spotted skipper, Moss' elfin, rhesus skipper, cross-line skipper, and modest sphinx moth could occur, but limited habitat for these species occurs in the project area. Any loss of native prairie could result in loss of habitat for these species.

Terrestrial Wildlife

Big Game

Direct effects to big game species such as mule deer, white-tailed deer, and elk could include displacement during construction and disturbance from increased light and human activity near the project area. The most substantial impacts to big game species would result from habitat fragmentation, disruption of movement corridors, and potential increases in collisions with vehicles as described below under *Wildlife Crossing Areas and Movement Corridors.*

Other Mammals

The project could result in effects to other mammals from disturbance of degraded habitat in areas such as highway or railway rights-of-way. Potential direct effects of the proposed project would include loss of habitat, especially grassland habitat; dispersal of individuals to new territories, disruption of migration and other seasonal movements, especially along riparian corridors; and increased mortality from collisions with automobiles. Potential indirect and long-term effects would include increased habitat fragmentation due to increased distance between habitat on either side of the highway. Potential impacts to wildlife crossing areas and movement corridors are described in more detail below under *Wildlife Crossing Areas and Movement Corridors*.

Birds

Raptors

Direct effects to raptors could include loss of highway right-of-way hunting habitat. Loss of hunting habitat would most likely effect common, human-tolerant species such as red-tailed hawks and American kestrels. Raptors requiring large trees for nesting, or perching would be temporarily affected where trees could be cut down or where trees are located close to highway or railway improvements. Indirect effects include increased potential for raptor collisions with vehicles as a result of increased traffic, behavioral disturbance induced by encroachment of human activities within 0.25 to 0.33 mile of nests (Craig 2002), increased noise, and increased disturbance from vehicle lights. Some behavioral disturbance could be temporary as raptors adapt to the changed environment.

Other migratory birds

Potential effects to migratory birds from the proposed project would include habitat loss, displacement during construction, increased habitat fragmentation, and destruction of nests during construction. A temporary loss of habitat would occur when grassy areas are cleared

and grubbed during construction, or when structures used for nesting are replaced. Ground-nesting birds would likely be most affected because the grasslands would be the habitat most affected by the project. Migratory birds using riparian areas could be temporarily displaced during bridge widening and replacement activities, and their nests could be disturbed or destroyed. Cliff swallows, which often nest on bridges and overpasses, could be directly affected by nest destruction or nesting disturbance during bridge replacement. Most direct impacts to nests will be avoided by implementing timing restrictions and other mitigation measures described in the mitigation section. Indirect effects include increased disturbance due to noise and light from vehicles, and increased mortality from collisions with vehicles.

Reptiles and Amphibians

The proposed project could affect habitat for reptiles and amphibians. In general, effects to reptiles and amphibians would result from disturbance of degraded habitat in areas such as highway rights-of-way. Direct effects could include mortality from being crushed by equipment during construction. Other potential effects could include loss of grasslands, riparian and wetland habitat; dispersal of individuals to new territories, disruption of migration and other seasonal movements, especially along riparian corridors; and increased mortality from collisions with automobiles. Potential indirect and long-term effects would include increased habitat fragmentation. Habitat loss for reptiles and amphibians could also result if roadside ditches are piped or drained as a direct result of the project or as a result of increasing urbanization indirectly related to the project.

Wildlife Crossing Areas and Movement Corridors

Roads and transportation corridors have many potential effects on wildlife, including habitat fragmentation, reduced access to habitat, population fragmentation and isolation, disruption of dispersal patterns, and mortality from collisions with vehicles (Jackson 2000). Movement corridors for big game and other wildlife are typically located along riparian corridors and stream crossings in the project area, because bridges and culverts at these locations provide an opportunity for wildlife to cross under the highway or railway. Underpasses and culverts are used by many species of wildlife during seasonal migrations, or to reach suitable habitat on the other side of the highway or railway (Barnum 2003). Without access to crossing sites such as culverts or bridges, wildlife either avoid crossing, resulting in isolation from suitable habitat, or risk being killed by vehicles while attempting to cross the highway.

Big game movement corridors in riparian areas would be temporarily disrupted during bridge widening and replacement activities. Many species are more likely to use underpasses that are wider or more open (Jackson and Griffin 2000; Barnum 2003). Replacement of culverts or bridges with larger culverts or bridges could benefit wildlife over the long term by creating wider movement corridors and increasing the overall openness ratio. East-west movements of deer and other mammals are already limited by the existing lanes of I-25, but the addition of new general purpose lanes could result in increased mortality due to collisions with vehicles. Construction of new retaining walls would also create barriers to wildlife movements across the highway, and could change wildlife crossing locations if the current at-grade crossing sites are blocked by walls (Barnum 2003).

Collisions with trains have been documented as a source of mortality for wildlife, including mule deer, white-tailed deer, and elk (Wells et al. 1999). Therefore, the existing BNSF railway probably results in some mortality to wildlife. Currently, the BNSF railway and the proposed commuter rail alignment are not major obstacles to wildlife movement due to the sporadic nature of fencing along the alignment, the small size of the fences (three-strand barbed wire), and relatively low frequency of rail traffic. The Regional Transportation District (RTD) would install 6-foot-high chain link fences along the entire commuter rail corridor for safety purposes. Fences on both sides of rail alignments can trap wildlife between walls without any escape route, resulting in mortality. Construction of new retaining walls along the rail alignment would also create new barriers to wildlife movement. Where retaining walls are present, the fences would be located along the top of the retaining wall. Implementation of the Package A transit alternatives would create a substantial barrier to wildlife movement because of the new fences and retaining walls, and would result in habitat fragmentation by isolating patches of wildlife habitat on opposite sides of the rail alignment. Retaining walls and fences typically funnel wildlife movements toward existing underpasses and crossing sites (Barnum 2003). Bridges and culverts would therefore become much more important for wildlife movement after construction of the proposed commuter rail.

Sensitive Wildlife Habitats

Impacts to sensitive wildlife habitats could include loss of wildlife habitat, disruption of wildlife movement corridors, potential loss of habitat for threatened and endangered species such as Preble's and bald eagle, and potential indirect effects to aquatic species. Potential effects are described under the impact sections for federally listed threatened, endangered, and candidate species; wildlife species of concern; terrestrial wildlife; and aquatic resources.

Aquatic Resources

Potential impacts to other aquatic species would be similar to the impacts previously described for sensitive fish and aquatic invertebrates, and could include temporary loss of habitat due to work within streams, increased sediment loads during construction, and interference with seasonal movements. These impacts would be short-term and would be mitigated through use of construction Best Management Practices (BMPs).

Increases in traffic could result in increased contaminants in roadway runoff, including deicer, and would increase the risk of accidental spills of hazardous materials, which could affect aquatic species. Wider bridges would cause greater shading of streams, potentially altering stream temperature. New stations and parking lots would increase impervious surface area, leading to increased runoff to nearby streams.

Construction of new water quality ponds could result in an indirect benefit to aquatic resources by improving water quality in streams and water bodies downstream. Construction of new culverts or lengthening existing culverts would adversely affect fish by increasing shading or replacing natural streambed with concrete. Stream habitat would be improved through the replacement of existing culverts with larger culverts or free-spanning bridges. Removal or redesign of drops that act as barriers would also benefit fish.

Mitigation and Recommendations

This section describes recommendations for reducing or mitigating proposed project impacts to wildlife, and presents possible mitigation opportunities. Whenever possible, mitigation measures to avoid or reduce impacts to wildlife would be incorporated into the proposed project, including avoiding sensitive habitat, using BMPs to control erosion and drainage improvements, and promptly revegetating disturbed areas.

The proposed project area falls within the Shortgrass Prairie Initiative. In January 2004, the Colorado Department of Transportation (CDOT), Colorado Department of Natural Resources Division of Wildlife, the Federal Highway Administration, and the Fish and Wildlife Service (USFWS) and public and private partners agreed on a “Shortgrass Prairie Initiative” as an alternative way to address species impacts in the eastern third of the state. The Shortgrass Prairie Initiative (initiative) provides programmatic clearance for CDOT activities on the existing road network in the eastern third of Colorado for the next 20 years. Covered transportation projects include; 1) bridge repairs for all existing bridges, 2) approximately 4,310 miles of resurfacing/overlays and accompanying shoulder improvements, 3)

maintenance along existing transportation corridors, and 4) safety, reconstruction, capacity and other transportation improvements (USFWS 2004b, Venner 2001).

The Biological Assessment (BA) includes all of I-25 within Colorado. A Biological Opinion (BO) was issued by the USFWS, which covers the bald eagle and 29 species of concern (USFWS 2003b). The BO includes a list of measures to minimize effects to the bald eagle, including protecting off-site shortgrass prairie habitat and implementation of on-site BMPs. The BO also includes proposed conservation measures for sensitive, nonlisted species including black-tailed prairie dog, burrowing owl, native fish and mussels (including brassy minnow, common shiner, plains minnow, and cylindrical papershell), and northern leopard frog. The BO lists BMPs for each of these species and provides that if any of these species are listed, the appropriate protective measures will be incorporated into the BO. The BO was amended in February 2008 to address the change in status for the bald eagle (USFWS 2008). The Shortgrass Prairie Initiative does not cover Preble's because CDOT is engaging in a separate consultation for this species in Douglas and El Paso counties (USFWS 2003 b). Other species explicitly not covered in the BO include black-footed ferret and Ute ladies tresses' orchid.

Specific mitigation recommendations, in addition to those in the Shortgrass Prairie Initiative, are described below.

Federally Listed Threatened, Endangered, and Candidate Species

Preble's Meadow Jumping Mouse

- Mitigation measures for occupied Preble's habitat may be required as part of Section 7 consultation with the USFWS for impacts to federally listed threatened and endangered species. Mitigation measures would focus on avoidance and minimization of impacts during construction. Avoidance and minimization measures include limiting timing of construction to Preble's inactive season (November through April) or use of visible barriers to limit the area of construction.

- If culverts in Preble's habitat are replaced or upgraded, the new culverts could incorporate ledges to facilitate small mammal passage.

- Where impacts are unavoidable, compensatory mitigation would be provided through replacement with suitable habitat for Preble's. Mitigation measures for Preble's could be combined with wetlands mitigation. Wetland mitigation measures may also replace any impacts to suitable unoccupied Preble's habitat.

Other Federally Protected Species

Bald Eagle

- A raptor nest survey (to include bald eagles) would be conducted prior to construction to identify bald eagle nests near the project area. If an active bald eagle nest is found within ½ mile of the project area, the buffers and seasonal restrictions recommended by CDOW (no human encroachment within ½ mile of the nest from November 15 to July 31) would be established during construction to avoid nest abandonment.

- No construction would occur within ¼ mile of active nocturnal roosts between November 15 and March 15. If perch or roost trees are removed during construction, they would be replaced at a 2:1 ratio with cottonwood trees.

- Mitigation for wetland impacts would also provide mitigation for impacts to riparian habitats used for foraging by bald eagles.

Wildlife Species of Concern

Black-tailed Prairie Dog

Prairie dog distribution in the project area is likely to change between the time field surveys were conducted and the time construction occurs, so prairie dog colonies would likely need to be resurveyed prior to construction.

In areas where avoidance of prairie dogs is not possible, CDOT would follow its guidelines for mitigating impacts. CDOT's prairie dog guidelines include:

- CDOT projects will be designed and constructed to avoid and minimize impacts to prairie dog colonies greater than 2 acres in area.

- If a colony is less than two acres, but has the potential to expand into areas that are currently inactive (i.e., not constrained), the available and accessible habitat will be the determining size of the area to be considered.

- In order to foster a heightened sense of CDOT's ecological stewardship by the public, projects involving towns less than 2 acres in area will be designed and constructed to avoid and minimize impacts, which may include the relocation of prairie dogs, so long as doing so will not increase the impacts to other resources (e.g., wetlands, historical properties, environmental justice issues, archeological sites, etc.) and is not cost prohibitive.

- The area of prairie dog towns that will be affected by a project will be calculated before construction begins.

- Relocation efforts for prairie dog towns greater than two acres shall be conducted in accordance with CRS 35-7-203, as well as any other applicable laws or regulations.

- If a relocation site cannot be located for towns larger than two acres, the prairie dogs will be captured and donated to raptor rehabilitation facilities, or turned over to the USFWS for the black-footed ferret reintroduction program.

- At no time will CDOT authorize earth-moving activities that result in the burying of living prairie dogs. If needed, humane techniques for the killing of prairie dogs within a town less than two acres in size (recommended humane techniques) will be obtained from CDOW.

- Coordination with the CDOW District Wildlife Manager whose area the project is in will be initiated before any manipulation of prairie dogs or their colonies begins.

- Due to the possibility of disease vectoring, until further notice, coordination with the Food and Drug Administration will be initiated if any prairie dogs, dead or alive, are to be transported.

Western Burrowing Owl

- Burrowing owl surveys would be conducted prior to any work in prairie dog colonies between March 15 and October 31 when burrowing owls are present in Colorado (CDOW 2007). If burrowing owls are present, prairie dog removal would be scheduled to occur outside this time period.

- If burrowing owls are found within the construction footprint during preconstruction surveys, nests would be left undisturbed and additional avoidance measures would be developed in coordination with CDOW. No human encroachment or disturbance would occur within 150 feet of a known nesting site until after November 1, or until it can be confirmed that owls have left the prairie dog town (CDOW 2007).

- Direct impacts to burrowing owls would be avoided by covering or destroying prairie dog burrows prior to construction (prior to March 15) in order to prevent burrowing owls from nesting in the construction area. Prairie dogs would be humanely removed following CDOT's prairie dog policy prior to destruction of burrows.

Great Blue Heron

Direct impacts to nesting great blue herons would be avoided by avoiding work within the 500-meter (0.31 mile) buffer from nest sites recommended by CDOW (NDIS 2006). Impacts within this buffer would be limited during the great blue heron nesting season, which occurs from mid-March through July.

Common Gartersnake and Northern Leopard Frog

- Mitigation measures for wetlands and Preble's, including wetlands replacement and riparian enhancement, would also mitigate for impacts to northern leopard frogs and common gartersnakes.

- Replacement of culverts with larger culverts or free-spanning bridges would also mitigate for potential impacts to northern leopard frog and common gartersnake.

State Sensitive Fish

The project would comply with SB40, which requires any agency of the State of Colorado to obtain wildlife certification from CDOW when the agency plans construction in any stream

or its bank or tributaries. An application for SB40 wildlife certification would be submitted to CDOW. CDOW would review the plans to ensure that the project adequately protects fish and wildlife resources, and would provide recommendations if the proposed project would adversely affect a stream.

To offset temporary impacts to aquatic species from habitat disturbance, aquatic habitats will be restored after construction activities have ceased. The following design measures will be implemented to mitigate potential impacts to aquatic species, including native fish:

- Ripples and pools will be maintained and/or created.
- Natural stream bottoms will be maintained where possible.
- Culverts will be partially buried and the bottom will be covered with gravel/sand and have a low gradient.
- Culverts to be replaced will be replaced with one of equal or greater size.
- Culverts will not have grates, impact dissipaters, or any other features that would impede fish movement.
- To avoid erosion-induced siltation and sedimentation, sediment/erosion control BMPs will be placed during each phase of construction. Upon completion of slope, seeding in combination with mulch and mulch tackifier or blanket will occur within the limits set in Section 208 of CDOT specifications.
- Erosion control blankets will be "wildlife friendly", consisting of 100 percent biodegradable materials.
- Access points to streams during construction will be limited to minimize degradation of the banks.
- No new fish passage barriers will be created.
- Existing drop structures that create a barrier to fish movements will be removed or redesigned where possible. An example is the drop structure located east of the frontage road at I-25 and St. Vrain Creek, which is planned to be modified to facilitate fish passage as part of this project.

CDOT's water quality BMPs will be applied, and include the installation of mechanisms to collect, contain, and/or treat roadway run-off. Mitigation measures designed to offset impacts to wetlands and Preble's, including habitat replacement/enhancement and the replacement of existing culverts with larger culverts and/or free-spanning bridges, would also improve fish habitat.

Invertebrates

The mitigation measures for state-sensitive fish species described above, including SB40 certification and water quality BMPs, also benefit sensitive aquatic invertebrates such as the cylindrical papershell and *Mesocapnia frisoni* stonefly.

Terrestrial Wildlife

This section describes recommendations for reducing or mitigating proposed project impacts to wildlife, and presents possible mitigation opportunities. Whenever possible, mitigation measures to avoid or reduce impacts to wildlife will be incorporated into the proposed project, including avoiding sensitive habitat, using retaining walls to avoid or minimize impacts, using BMPs to control erosion and drainage improvements, and promptly revegetating disturbed areas. The following overall mitigation measures would apply to all project components.

Big Game and Movement Corridors

Impacts to big game will be minimized through construction of crossing structures that are designed to maintain wildlife movement corridors. In areas identified as important movement corridors, the following measures are recommended. These mitigation measures may not be feasible at all wildlife crossing areas due to cost or engineering issues. The locations where these mitigation measures will be implemented will be identified as the preferred alternative is identified and final design is undertaken.

To maximize use of movement corridors by wildlife, bridge spans and culverts should have the following features:

- A minimum clearance of 10 feet and width of 20 feet for deer (Ruediger and DiGiorgio 2007). Crossing structures sized for deer would be adequate for most common wildlife. The recommended minimum culvert diameter is 48 inches for medium-sized carnivores and 36 inches for small carnivores (Ruediger and DiGiorgio 2007).
- A minimum "openness ratio" of 0.75. The "openness ratio" is defined as the height of the structure multiplied by the structure width and divided by the structure length, measured in meters. A minimum openness ratio of 2.0 is recommended by some researchers (Ruediger and DiGiorgio 2007).
- Shrubs and vegetative cover placed at bridge underpass openings to attract wildlife and provide a "funnel effect."
- For structures that periodically convey water, provide ledges or shelves as passage alternatives during high water.

- To avoid human disturbance to wildlife, trails should not be placed near wildlife crossing structures, if possible.

The wildlife corridor near Ish Reservoir does not occur along a drainage, and construction of a bridge or culvert at this location would be more difficult than at other wildlife corridors.

Other recommended design elements include:

- Avoid the placement of lighting near the crossing structures (where lighting is required, lights should be directed downward and covered to minimize light spill-over).
- Avoid attracting wildlife to the ROW by keeping roadside vegetation height to a minimum.
- Mitigate for traffic noise.

Other Mammals, Reptiles, and Amphibians

Many other wildlife species, such as small and medium sized mammals, reptiles, and amphibians use the same migration corridors used by larger animals, and would benefit from mitigation measures for wildlife movement corridors described above. Effects to other wildlife from impacts to grasslands would be mitigated by mitigation measures described for vegetation. .

Other sensitive wildlife habitat areas are generally located along major drainageways. Mitigation measures for impacts to vegetation, wetlands, and Preble's habitat would also benefit these areas.

Birds

Migratory birds

For projects that potentially have an impact to migratory birds, CDOT will implement the following mitigation measures:

- Tree trimming and/or removal activities will be completed before birds begin to nest or after the young have fledged. In Colorado, most nesting and rearing activities occur between April 1 and August 31. However, since some birds nest as early as February, a nesting bird survey will be conducted by a biologist before any tree trimming or removal activities begin.
- Bridge or box culvert work that may disturb nesting birds will be completed before birds begin to nest or after the young have fledged. No bridge or box culvert work will take place between April 1 and August 31. If work activities are planned between these dates, nests will be removed (before nesting begins) and appropriate measures taken to assure no new nests are constructed.

- Clearing and grubbing of vegetation that may disturb ground nesting birds will be completed before birds begin to nest or after the young have fledged. If work activities are planned between April 1 and August 31, vegetation will be removed and/or trimmed to a height of six inches or less prior to April 1. Once vegetation has been removed and/or trimmed, appropriate measures, i.e. repeated mowing/trimming, will be implemented to assure vegetation does not grow more than six inches.

Raptors

CDOW has developed recommended buffer zones and seasonal restrictions for new surface occupancy within certain distances of nest sites of several raptor species (Appendix D). Surface occupancy is defined as human-occupied buildings and other structures such as oil and gas wells, roads, railroad tracks, and trails. The USFWS typically considers that implementation of the CDOW buffers and seasonal restrictions fulfill compliance requirements of the MBTA for raptors.

A raptor nest survey would be conducted prior to project construction to identify raptor nests in the vicinity of the proposed project. If an active raptor nest is found on-site, the recommended buffers and seasonal restrictions recommended by CDOW (Craig 2002, Appendix D) for raptors will be established during construction to avoid nest abandonment.

If disturbance of raptor nests is unavoidable, mitigation measures could include the construction of artificial nests in suitable habitat or enhancement of prey habitat. Artificial nests would be constructed in the same general area as impacts. If raptor nests would be impacted by the proposed project, specific mitigation measures for impacts to nesting raptors would be developed in coordination with CDOW and USFWS prior to construction.

Aquatic Resources

The mitigation measures for state-sensitive fish species described above, including SB40 certification, design measures to benefit fish, and water quality BMPs, would also benefit other aquatic resources.

Mitigation measures designed to offset impacts to wetlands and Preble's, including habitat replacement/enhancement and the replacement of existing culverts with larger culverts and/or free-spanning bridges, would also improve fish habitat.

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APPENDIX A
CDOT Impacted Prairie Dog Policy

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MEMORANDUM

DEPARTMENT OF TRANSPORTATION
THOMAS E. NORTON
Executive Director
4201 E. Arkansas Avenue, Room 262
Denver, CO 80222
(303) 757-9201

DATE: March 4, 2005

TO: Executive Management Team

FROM: Tom Norton

SUBJECT: Impacted Black-tailed Prairie Dog Policy

Over the winter of 2004-2005 the Chief Engineer, RPEMs, and RTDs agreed upon the following policy for addressing Black-tailed prairie dogs that will be impacted by CDOT projects. These guidelines should be applied to all CDOT activities that affect Black-tailed prairie dogs.

1) CDOT projects will be designed and constructed to avoid and minimize impacts to prairie dog colonies greater than two acres in area;

2) If a colony is less than two acres, but has the potential to expand into areas that are currently inactive (i.e., not constrained), the available and accessible habitat will be the determining size of the area to be considered;

3) In order to foster a heightened sense of CDOT's ecological stewardship by the public, projects involving towns less than two acres in area, will be designed and constructed to avoid and minimize impacts, which may include the relocation of prairie dogs, so long as doing so will not increase the impacts to other resources (e.g. wetlands, historical properties, environmental justice issues, archeological sites, etc.) and is not cost prohibitive;

4) The area of prairie dog towns that will be affected by a project will be calculated before construction begins;

5) Relocation efforts for prairie dog town greater than two acres shall be conducted in accordance with CRS 35-7-203, as well as any other applicable laws or regulations;

6) If a relocation site cannot be located for towns larger than two acres, the prairie dogs will be captured and donated to raptor rehabilitation facilities, or turned over the FWS for the black-footed ferret reintroduction program;

7) At no time will CDOT authorize earth-moving activities that result in the burying of living prairie dogs. If needed, humane techniques for the killing of prairie dogs within a town < 2 acres in size, will be obtained from CDOW;

8) Coordination with the Colorado Division of Wildlife's District Wildlife Manager whose area the project is in, will be initiated before any manipulation of prairie dogs or their colonies begins;

9) Due to the possibility of disease vectoring, until further notice, coordination with the Food and Drug Administration will be initiated if any prairie dogs, dead or alive, are to be transported.

The matrix below outlines the steps and the order they are to be taken based on the preconstruction area of an affected prairie dog town.

Preconstruction area of available prairie dog habitat[1]

	greater than 2 acres	less than two acres
1st	Avoid and minimize impacts	Avoid and minimize impacts
2nd	Relocate	Donate to ferret program and/or raptor rehab program
3rd	Donate to ferret program and/or raptor rehab program	Humanely euthanize[2]
4th	Humanely euthanize[2]	-------

1. Area of land able to be used by prairie dog that may or may not be occupied; calculated before a project begins.
2. Aluminum phosphate capsules, carbon monoxide gas cartridges or carbon dioxide gas cartridges are currently recommended, but not the exclusion of any future technologies that may be developed.

Background

On February 4, 2000 the United States Fish and Wildlife Service (USFWS) classified the black-tailed prairie dog as a candidate species for protection under the Endangered Species Act. In October of that same year the State of Colorado designated the black-tailed prairie dog a Species of Concern.

On January 8, 2002 I signed a memo outlining guidelines for the relocation of black-tailed prairie dogs impacted by CDOT activities. Subsequently, the USFWS has removed the black-tailed prairie dog from the federal candidate species list. However, the State of Colorado has retained it on their list of species of concern.

It is important that CDOT adopt a statewide strategy that will assist in diminishing the negative effects that transportation related activities have on the continued survival and recovery of the species. Adopting a pro-active departmental policy under the authority of CDOT may help minimize the possibility of federal listing of the black-tailed prairie dog in the future and is consistent with State and Transportation Commission policy direction.

Policy Basis

The Transportation Commission has adopted policy statements and policy statements and policy guidance in the 2020 Statewide Transportation Plant adopted November 2000, that direct CDOT activities. These include:

"Statewide Transportation Policy on the Environment:
CDOT will promote a transportation system that is environmentally responsible and encourages preservation of the natural and enhancement of the created environment for current and future generations. We will incorporate social, economic, and environmental concerns into the planning design, construction, maintenance and operations of the states existing and future transportation system. With the active participation of the general public, federal, state and local agencies, we will objectively consider all reasonable alternatives to avoid or minimize adverse impacts."

and:

"Environmental Policy Guidance:
The Transportation Commission supports pro-active techniques to mitigate impacts of the transportation system on the environment by developing creative strategies that:

- Comprehensively address anticipated environmental impacts of the state transportation system.
- Consider project enhancements in affected communities in a cost effective manner consistent with the mission of the Department; and
- Expedite project development."

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APPENDIX B

Mammals, Birds, Reptiles, and Amphibians Known to Occur in Adams, Boulder, Broomfield, Denver, Larimer, and Weld Counties, Colorado

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Appendix B.
Mammals, Birds, Reptiles, and Amphibians Known to Occur in Adams, Boulder, Broomfield, Denver, Larimer, and Weld Counties, Colorado

Group	Common Name	Scientific Name	Status
Amphibians	Boreal Toad	*Bufo boreas*	State endangered
Amphibians	Bullfrog	*Rana catesbeiana*	Non-listed
Amphibians	Great Plains Toad	*Bufo cognatus*	Non-listed
Amphibians	Northern Cricket Frog	*Acris crepitans*	Non-listed
Amphibians	Northern Leopard Frog	*Rana pipiens*	State special concern
Amphibians	Plains Spadefoot	*Spea bombifrons*	Non-listed
Amphibians	Tiger Salamander	*Ambystoma tigrinum*	Non-listed
Amphibians	Western Chorus Frog	*Pseudacris triseriata*	Non-listed
Amphibians	Woodhouse's Toad	*Bufo woodhousii*	Non-listed
Birds	Acorn Woodpecker	*Melanerpes formicivorus*	Non-listed
Birds	American Avocet	*Recurvirostra americana*	Non-listed
Birds	American Bittern	*Botaurus lentiginosus*	Non-listed
Birds	American Coot	*Fulica americana*	Non-listed
Birds	American Crow	*Corvus brachyrhynchos*	Non-listed
Birds	American Dipper	*Cinclus mexicanus*	Non-listed
Birds	American Golden Plover	*Pluvialis dominica*	Non-listed
Birds	American Goldfinch	*Carduelis tristis*	Non-listed
Birds	American Kestrel	*Falco sparverius*	Non-listed
Birds	American Peregrine Falcon	*Falco peregrinus anatum*	Non-listed
Birds	American Pipit	*Anthus rubescens*	Non-listed
Birds	American Redstart	*Setophaga ruticilla*	Non-listed
Birds	American Robin	*Turdus migratorius*	Non-listed
Birds	American Tree Sparrow	*Spizella arborea*	Non-listed
Birds	American White Pelican	*Pelecanus erythrorhynchos*	Non-listed
Birds	American Wigeon	*Anas americana*	Non-listed
Birds	Ash-throated Flycatcher	*Myiarchus cinerascens*	Non-listed

Appendix B.
Mammals, Birds, Reptiles, and Amphibians Known to Occur in Adams, Boulder, Broomfield, Denver, Larimer, and Weld Counties, Colorado

Group	Common Name	Scientific Name	Status
Birds	Baird's Sandpiper	*Calidris bairdii*	Non-listed
Birds	Bald Eagle	*Haliaeetus leucocephalus*	Non-listed
Birds	Baltimore Oriole	*Icterus galbula*	Non-listed
Birds	Band-tailed Pigeon	*Columba fasciata*	Non-listed
Birds	Bank Swallow	*Riparia riparia*	Non-listed
Birds	Barn Owl	*Tyto alba*	Non-listed
Birds	Barn Swallow	*Hirundo rustica*	Non-listed
Birds	Barrow's Goldeneye	*Bucephala islandica*	Non-listed
Birds	Bell's Vireo	*Vireo bellii*	Non-listed
Birds	Belted Kingfisher	*Ceryle alcyon*	Non-listed
Birds	Bewick's Wren	*Thryomanes bewickii*	Non-listed
Birds	Black Phoebe	*Sayornis nigricans*	Non-listed
Birds	Black Rail	*Laterallus jamaicensis*	Non-listed
Birds	Black Rosy Finch	*Leucosticte atrata*	Non-listed
Birds	Black Swift	*Cypseloides niger*	Non-listed
Birds	Black Tern	*Chlidonias niger*	Non-listed
Birds	Black-and-white Warbler	*Mniotilta varia*	Non-listed
Birds	Black-bellied Plover	*Pluvialis squatarola*	Non-listed
Birds	Black-billed Cuckoo	*Coccyzus erythropthalmus*	Non-listed
Birds	Black-billed Magpie	*Pica pica*	Non-listed
Birds	Black-capped Chickadee	*Poecile atricapillus*	Non-listed
Birds	Black-chinned Hummingbird	*Archilochus alexandri*	Non-listed
Birds	Black-crowned Night-Heron	*Nycticorax nycticorax*	Non-listed
Birds	Black-headed Grosbeak	*Pheucticus melanocephalus*	Non-listed
Birds	Black-necked Stilt	*Himantopus mexicanus*	Non-listed
Birds	Blackpoll Warbler	*Dendroica striata*	Non-listed

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Group	Common Name	Scientific Name	Status
Birds	Black-throated Gray Warbler	*Dendroica nigrescens*	Non-listed
Birds	Black-throated Sparrow	*Amphispiza bilineata*	Non-listed
Birds	Blue Grosbeak	*Guiraca caerulea*	Non-listed
Birds	Blue Grouse	*Dendragapus obscurus*	Non-listed
Birds	Blue Jay	*Cyanocitta cristata*	Non-listed
Birds	Blue-gray Gnatcatcher	*Polioptila caerulea*	Non-listed
Birds	Blue-winged Teal	*Anas discors*	Non-listed
Birds	Bobolink	*Dolichonyx oryzivorus*	Non-listed
Birds	Bohemian Waxwing	*Bombycilla garrulus*	Non-listed
Birds	Bonaparte's Gull	*Larus philadelphia*	Non-listed
Birds	Boreal Owl	*Aegolius funereus*	Non-listed
Birds	Brewer's Blackbird	*Euphagus cyanocephalus*	Non-listed
Birds	Brewer's Sparrow	*Spizella breweri*	Non-listed
Birds	Broad-tailed Hummingbird	*Selasphorus platycercus*	Non-listed
Birds	Broad-winged Hawk	*Buteo platypterus*	Non-listed
Birds	Brown Creeper	*Certhia americana*	Non-listed
Birds	Brown Thrasher	*Toxostoma rufum*	Non-listed
Birds	Brown-capped Rosy Finch	*Leucosticte australis*	Non-listed
Birds	Brown-headed Cowbird	*Molothrus ater*	Non-listed
Birds	Bufflehead	*Bucephala albeola*	Non-listed
Birds	Bullock's Oriole	*Icterus bullockii*	Non-listed
Birds	Bushtit	*Psaltriparus minimus*	Non-listed
Birds	California Gull	*Larus californicus*	Non-listed
Birds	Calliope Hummingbird	*Stellula calliope*	Non-listed
Birds	Canada Goose	*Branta canadensis*	Non-listed
Birds	Canvasback	*Aythya valisineria*	Non-listed

Appendix B.
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Group	Common Name	Scientific Name	Status
Birds	Canyon Wren	*Catherpes mexicanus*	Non-listed
Birds	Carolina Wren	*Thryothorus ludovicianus*	Non-listed
Birds	Cassin's Finch	*Carpodacus cassinii*	Non-listed
Birds	Cassin's Kingbird	*Tyrannus vociferans*	Non-listed
Birds	Cassin's Sparrow	*Aimophila cassinii*	Non-listed
Birds	Cattle Egret	*Bubulcus ibis*	Non-listed
Birds	Cedar Waxwing	*Bombycilla cedrorum*	Non-listed
Birds	Chestnut-collared Longspur	*Calcarius ornatus*	Non-listed
Birds	Chihuahuan Raven	*Corvus cryptoleucus*	Non-listed
Birds	Chimney Swift	*Chaetura pelagica*	Non-listed
Birds	Chipping Sparrow	*Spizella passerina*	Non-listed
Birds	Chukar	*Alectoris chukar*	Non-listed
Birds	Cinnamon Teal	*Anas cyanoptera*	Non-listed
Birds	Clark's Grebe	*Aechmophorus clarkii*	Non-listed
Birds	Clark's Nutcracker	*Nucifraga columbiana*	Non-listed
Birds	Clay-colored Sparrow	*Spizella pallida*	Non-listed
Birds	Cliff Swallow	*Petrochelidon pyrrhonota*	Non-listed
Birds	Common Goldeneye	*Bucephala clangula*	Non-listed
Birds	Common Grackle	*Quiscalus quiscula*	Non-listed
Birds	Common Loon	*Gavia immer*	Non-listed
Birds	Common Merganser	*Mergus merganser*	Non-listed
Birds	Common Nighthawk	*Chordeiles minor*	Non-listed
Birds	Common Poorwill	*Phalaenoptilus nuttallii*	Non-listed
Birds	Common Raven	*Corvus corax*	Non-listed
Birds	Common Redpoll	*Carduelis flammea*	Non-listed
Birds	Common Snipe	*Gallinago gallinago*	Non-listed

Appendix B.
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Group	Common Name	Scientific Name	Status
Birds	Common Tern	*Sterna hirundo*	Non-listed
Birds	Common Yellowthroat	*Geothlypis trichas*	Non-listed
Birds	Cooper's Hawk	*Accipiter cooperii*	Non-listed
Birds	Cordilleran Flycatcher	*Empidonax occidentalis*	Non-listed
Birds	Curve-billed Thrasher	*Toxostoma curvirostre*	Non-listed
Birds	Dark-eyed Junco	*Junco hyemalis*	Non-listed
Birds	Dickcissel	*Spiza americana*	Non-listed
Birds	Double-crested Cormorant	*Phalacrocorax auritus*	Non-listed
Birds	Downy Woodpecker	*Picoides pubescens*	Non-listed
Birds	Dusky Flycatcher	*Empidonax oberholseri*	Non-listed
Birds	Eared Grebe	*Podiceps nigricollis*	Non-listed
Birds	Eastern Bluebird	*Sialia sialis*	Non-listed
Birds	Eastern Kingbird	*Tyrannus tyrannus*	Non-listed
Birds	Eastern Meadowlark	*Sturnella magna*	Non-listed
Birds	Eastern Phoebe	*Sayornis phoebe*	Non-listed
Birds	Eastern Screech-Owl	*Otus asio*	Non-listed
Birds	European Starling	*Sturnus vulgaris*	Non-listed
Birds	Evening Grosbeak	*Coccothraustes vespertinus*	Non-listed
Birds	Ferruginous Hawk	*Buteo regalis*	State special concern
Birds	Field Sparrow	*Spizella pusilla*	Non-listed
Birds	Flammulated Owl	*Otus flammeolus*	Non-listed
Birds	Forster's Tern	*Sterna forsteri*	Non-listed
Birds	Fox Sparrow	*Passerella iliaca*	Non-listed
Birds	Franklin's Gull	*Larus pipixcan*	Non-listed
Birds	Gadwall	*Anas strepera*	Non-listed
Birds	Gambel's Quail	*Callipepla gambelii*	Non-listed

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Group	Common Name	Scientific Name	Status
Birds	Glaucous Gull	*Larus hyperboreus*	Non-listed
Birds	Golden Eagle	*Aquila chrysaetos*	Non-listed
Birds	Golden-crowned Kinglet	*Regulus satrapa*	Non-listed
Birds	Grace's Warbler	*Dendroica graciae*	Non-listed
Birds	Grasshopper Sparrow	*Ammodramus savannarum*	Non-listed
Birds	Gray Catbird	*Dumetella carolinensis*	Non-listed
Birds	Gray Flycatcher	*Empidonax wrightii*	Non-listed
Birds	Gray Jay	*Perisoreus canadensis*	Non-listed
Birds	Gray Vireo	*Vireo vicinior*	Non-listed
Birds	Gray-crowned Rosy Finch	*Leucosticte tephrocotis*	Non-listed
Birds	Great Blue Heron	*Ardea herodias*	Non-listed
Birds	Great Crested Flycatcher	*Myiarchus crinitus*	Non-listed
Birds	Great Egret	*Ardea alba*	Non-listed
Birds	Great Horned Owl	*Bubo virginianus*	Non-listed
Birds	Greater Prairie-chicken	*Tympanuchus cupido*	Non-listed
Birds	Greater Roadrunner	*Geococcyx californianus*	Non-listed
Birds	Greater Sandhill Crane	*Grus canadensis tabida*	State special concern
Birds	Greater Scaup	*Aythya marila*	Non-listed
Birds	Greater White-fronted Goose	*Anser albifrons*	Non-listed
Birds	Greater Yellowlegs	*Tringa melanoleuca*	Non-listed
Birds	Great-tailed Grackle	*Quiscalus mexicanus*	Non-listed
Birds	Green Heron	*Butorides virescens*	Non-listed
Birds	Green-tailed Towhee	*Pipilo chlorurus*	Non-listed
Birds	Green-winged Teal	*Anas crecca*	Non-listed
Birds	Hairy Woodpecker	*Picoides villosus*	Non-listed
Birds	Hammond's Flycatcher	*Empidonax hammondii*	Non-listed

Appendix B.
Mammals, Birds, Reptiles, and Amphibians Known to Occur in Adams, Boulder, Broomfield, Denver, Larimer, and Weld Counties, Colorado

Group	Common Name	Scientific Name	Status
Birds	Harris' Sparrow	*Zonotrichia querula*	Non-listed
Birds	Hepatic Tanager	*Piranga flava*	Non-listed
Birds	Hermit Thrush	*Catharus guttatus*	Non-listed
Birds	Herring Gull	*Larus argentatus*	Non-listed
Birds	Hooded Merganser	*Lophodytes cucullatus*	Non-listed
Birds	Horned Grebe	*Podiceps auritus*	Non-listed
Birds	Horned Lark	*Eremophila alpestris*	Non-listed
Birds	House Finch	*Carpodacus mexicanus*	Non-listed
Birds	House Sparrow	*Passer domesticus*	Non-listed
Birds	House Wren	*Troglodytes aedon*	Non-listed
Birds	Indigo Bunting	*Passerina cyanea*	Non-listed
Birds	Juniper Titmouse	*Baeolophus griseus*	Non-listed
Birds	Killdeer	*Charadrius vociferus*	Non-listed
Birds	Ladder-backed Woodpecker	*Picoides scalaris*	Non-listed
Birds	Lapland Longspur	*Calcarius lapponicus*	Non-listed
Birds	Lark Bunting	*Calamospiza melanocorys*	Non-listed
Birds	Lark Sparrow	*Chondestes grammacus*	Non-listed
Birds	Lazuli Bunting	*Passerina amoena*	Non-listed
Birds	Least Bittern	*Ixobrychus exilis*	Non-listed
Birds	Least Sandpiper	*Calidris minutilla*	Non-listed
Birds	Least Tern	*Sterna antillarum*	Non-listed
Birds	Lesser Goldfinch	*Carduelis psaltria*	Non-listed
Birds	Lesser Prairie-chicken	*Tympanuchus pallidicinctus*	State threatened
Birds	Lesser Scaup	*Aythya affinis*	Non-listed
Birds	Lesser Yellowlegs	*Tringa flavipes*	Non-listed
Birds	Lewis' Woodpecker	*Melanerpes lewis*	Non-listed

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Mammals, Birds, Reptiles, and Amphibians Known to Occur in Adams, Boulder, Broomfield, Denver, Larimer, and Weld Counties, Colorado

Group	Common Name	Scientific Name	Status
Birds	Lincoln's Sparrow	*Melospiza lincolnii*	Non-listed
Birds	Little Blue Heron	*Egretta caerulea*	Non-listed
Birds	Loggerhead Shrike	*Lanius ludovicianus*	Non-listed
Birds	Long-billed Curlew	*Numenius americanus*	Non-listed
Birds	Long-billed Dowitcher	*Limnodromus scolopaceus*	Non-listed
Birds	Long-eared Owl	*Asio otus*	Non-listed
Birds	MacGillivray's Warbler	*Oporornis tolmiei*	Non-listed
Birds	Mallard	*Anas platyrhynchos*	Non-listed
Birds	Marbled Godwit	*Limosa fedoa*	Non-listed
Birds	Marsh Wren	*Cistothorus palustris*	Non-listed
Birds	McCown's Longspur	*Calcarius mccownii*	Non-listed
Birds	Merlin	*Falco columbarius*	Non-listed
Birds	Mexican Spotted Owl	*Strix occidentalis lucida*	Federally threatened, state threatened
Birds	Mississippi Kite	*Ictinia mississippiensis*	Non-listed
Birds	Mountain Bluebird	*Sialia currucoides*	Non-listed
Birds	Mountain Chickadee	*Poecile gambeli*	Non-listed
Birds	Mountain Plover	*Charadrius montanus*	State special concern
Birds	Mourning Dove	*Zenaida macroura*	Non-listed
Birds	Nashville Warbler	*Vermivora ruficapilla*	Non-listed
Birds	Northern Bobwhite	*Colinus virginianus*	Non-listed
Birds	Northern Cardinal	*Cardinalis cardinalis*	Non-listed
Birds	Northern Flicker	*Colaptes auratus*	Non-listed
Birds	Northern Goshawk	*Accipiter gentilis*	Non-listed
Birds	Northern Harrier	*Circus cyaneus*	Non-listed
Birds	Northern Mockingbird	*Mimus polyglottos*	Non-listed
Birds	Northern Pintail	*Anas acuta*	Non-listed

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Mammals, Birds, Reptiles, and Amphibians Known to Occur in Adams, Boulder, Broomfield, Denver, Larimer, and Weld Counties, Colorado

Group	Common Name	Scientific Name	Status
Birds	Northern Pygmy-Owl	*Glaucidium gnoma*	Non-listed
Birds	Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	Non-listed
Birds	Northern Saw-whet Owl	*Aegolius acadicus*	Non-listed
Birds	Northern Shoveler	*Anas clypeata*	Non-listed
Birds	Northern Shrike	*Lanius excubitor*	Non-listed
Birds	Northern Waterthrush	*Seiurus noveboracensis*	Non-listed
Birds	Oldsquaw	*Clangula hyemalis*	Non-listed
Birds	Olive-sided Flycatcher	*Contopus cooperi*	Non-listed
Birds	Orange-crowned Warbler	*Vermivora celata*	Non-listed
Birds	Orchard Oriole	*Icterus spurius*	Non-listed
Birds	Osprey	*Pandion haliaetus*	Non-listed
Birds	Ovenbird	*Seiurus aurocapillus*	Non-listed
Birds	Pacific Loon	*Gavia pacifica*	Non-listed
Birds	Palm Warbler	*Dendroica palmarum*	Non-listed
Birds	Pectoral Sandpiper	*Calidris melanotos*	Non-listed
Birds	Peregrine Falcon	*Falco peregrinus*	Non-listed
Birds	Pied-billed Grebe	*Podilymbus podiceps*	Non-listed
Birds	Pine Grosbeak	*Pinicola enucleator*	Non-listed
Birds	Pine Siskin	*Carduelis pinus*	Non-listed
Birds	Pinyon Jay	*Gymnorhinus cyanocephalus*	Non-listed
Birds	Piping Plover	*Charadrius melodus*	Federally threatened, state threatened
Birds	Plains Sharp-tailed Grouse	*Tympanuchus phasianellus jamesii*	State endangered
Birds	Plumbeous Vireo	*Vireo plumbeus*	Non-listed
Birds	Prairie Falcon	*Falco mexicanus*	Non-listed
Birds	Purple Finch	*Carpodacus purpureus*	Non-listed
Birds	Purple Martin	*Progne subis*	Non-listed

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Group	Common Name	Scientific Name	Status
Birds	Pygmy Nuthatch	*Sitta pygmaea*	Non-listed
Birds	Red Crossbill	*Loxia curvirostra*	Non-listed
Birds	Red Knot	*Calidris canutus*	Non-listed
Birds	Red-bellied Woodpecker	*Melanerpes carolinus*	Non-listed
Birds	Red-breasted Merganser	*Mergus serrator*	Non-listed
Birds	Red-breasted Nuthatch	*Sitta canadensis*	Non-listed
Birds	Red-eyed Vireo	*Vireo olivaceus*	Non-listed
Birds	Redhead	*Aythya americana*	Non-listed
Birds	Red-headed Woodpecker	*Melanerpes erythrocephalus*	Non-listed
Birds	Red-naped Sapsucker	*Sphyrapicus nuchalis*	Non-listed
Birds	Red-necked Phalarope	*Phalaropus lobatus*	Non-listed
Birds	Red-tailed Hawk	*Buteo jamaicensis*	Non-listed
Birds	Red-winged Blackbird	*Agelaius phoeniceus*	Non-listed
Birds	Ring-billed Gull	*Larus delawarensis*	Non-listed
Birds	Ring-necked Duck	*Aythya collaris*	Non-listed
Birds	Ring-necked Pheasant	*Phasianus colchicus*	Non-listed
Birds	Rock Dove	*Columba livia*	Non-listed
Birds	Rock Wren	*Salpinctes obsoletus*	Non-listed
Birds	Rose-breasted Grosbeak	*Pheucticus ludovicianus*	Non-listed
Birds	Ross' Goose	*Chen rossii*	Non-listed
Birds	Rough-legged Hawk	*Buteo lagopus*	Non-listed
Birds	Ruby-crowned Kinglet	*Regulus calendula*	Non-listed
Birds	Ruddy Duck	*Oxyura jamaicensis*	Non-listed
Birds	Ruffed Grouse	*Bonasa umbellus*	Non-listed
Birds	Rufous Hummingbird	*Selasphorus rufus*	Non-listed
Birds	Rufous-crowned Sparrow	*Aimophila ruficeps*	Non-listed

Appendix B.
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Group	Common Name	Scientific Name	Status
Birds	Sabine's Gull	*Xema sabini*	Non-listed
Birds	Sage Grouse	*Centrocercus urophasianus*	Non-listed
Birds	Sage Sparrow	*Amphispiza belli*	Non-listed
Birds	Sage Thrasher	*Oreoscoptes montanus*	Non-listed
Birds	Sanderling	*Calidris alba*	Non-listed
Birds	Sandhill Crane	*Grus canadensis*	Non-listed
Birds	Savannah Sparrow	*Passerculus sandwichensis*	Non-listed
Birds	Say's Phoebe	*Sayornis saya*	Non-listed
Birds	Scissor-tailed Flycatcher	*Tyrannus forficatus*	Non-listed
Birds	Scott's Oriole	*Icterus parisorum*	Non-listed
Birds	Semipalmated Plover	*Charadrius semipalmatus*	Non-listed
Birds	Semipalmated Sandpiper	*Calidris pusilla*	Non-listed
Birds	Sharp-shinned Hawk	*Accipiter striatus*	Non-listed
Birds	Sharp-tailed Grouse	*Tympanuchus phasianellus*	Non-listed
Birds	Short-eared Owl	*Asio flammeus*	Non-listed
Birds	Snow Bunting	*Plectrophenax nivalis*	Non-listed
Birds	Snow Goose	*Chen caerulescens*	Non-listed
Birds	Snowy Egret	*Egretta thula*	Non-listed
Birds	Snowy Owl	*Nyctea scandiaca*	Non-listed
Birds	Snowy Plover	*Charadrius alexandrinus*	Non-listed
Birds	Solitary Sandpiper	*Tringa solitaria*	Non-listed
Birds	Song Sparrow	*Melospiza melodia*	Non-listed
Birds	Sora	*Porzana carolina*	Non-listed
Birds	Southwestern Willow Flycatcher	*Empidonax traillii extimus*	Federally endangered, state endangered
Birds	Spotted Sandpiper	*Actitis macularia*	Non-listed
Birds	Spotted Sandpiper	*Actitis macularia*	Non-listed

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Group	Common Name	Scientific Name	Status
Birds	Spotted Towhee	*Pipilo maculatus*	Non-listed
Birds	Steller's Jay	*Cyanocitta stelleri*	Non-listed
Birds	Stilt Sandpiper	*Calidris himantopus*	Non-listed
Birds	Surf Scoter	*Melanitta perspicillata*	Non-listed
Birds	Swainson's Hawk	*Buteo swainsoni*	Non-listed
Birds	Swainson's Thrush	*Catharus ustulatus*	Non-listed
Birds	Swamp Sparrow	*Melospiza georgiana*	Non-listed
Birds	Tennessee Warbler	*Vermivora peregrina*	Non-listed
Birds	Three-toed Woodpecker	*Picoides tridactylus*	Non-listed
Birds	Townsend's Solitaire	*Myadestes townsendi*	Non-listed
Birds	Townsend's Warbler	*Dendroica townsendi*	Non-listed
Birds	Tree Swallow	*Tachycineta bicolor*	Non-listed
Birds	Tundra Swan	*Cygnus columbianus*	Non-listed
Birds	Turkey Vulture	*Cathartes aura*	Non-listed
Birds	Upland Sandpiper	*Bartramia longicauda*	Non-listed
Birds	Varied Thrush	*Ixoreus naevius*	Non-listed
Birds	Veery	*Catharus fuscescens*	Non-listed
Birds	Vermilion Flycatcher	*Pyrocephalus rubinus*	Non-listed
Birds	Vesper Sparrow	*Pooecetes gramineus*	Non-listed
Birds	Violet-green Swallow	*Tachycineta thalassina*	Non-listed
Birds	Virginia Rail	*Rallus limicola*	Non-listed
Birds	Virginia's Warbler	*Vermivora virginiae*	Non-listed
Birds	Warbling Vireo	*Vireo gilvus*	Non-listed
Birds	Western Bluebird	*Sialia mexicana*	Non-listed
Birds	Western Burrowing Owl	*Athene cunicularia*	State threatened
Birds	Western Grebe	*Aechmophorus occidentalis*	Non-listed

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Group	Common Name	Scientific Name	Status
Birds	Western Kingbird	*Tyrannus verticalis*	Non-listed
Birds	Western Meadowlark	*Sturnella neglecta*	Non-listed
Birds	Western Sandpiper	*Calidris mauri*	Non-listed
Birds	Western Screech-Owl	*Otus kennicottii*	Non-listed
Birds	Western Scrub Jay	*Aphelocoma californica*	Non-listed
Birds	Western Snowy Plover	*Charadrius alexandrinus nivosus*	Non-listed
Birds	Western Tanager	*Piranga ludoviciana*	Non-listed
Birds	Western Wood-Pewee	*Contopus sordidulus*	Non-listed
Birds	Whimbrel	*Numenius phaeopus*	Non-listed
Birds	White-breasted Nuthatch	*Sitta carolinensis*	Non-listed
Birds	White-crowned Sparrow	*Zonotrichia leucophrys*	Non-listed
Birds	White-faced Ibis	*Plegadis chihi*	Non-listed
Birds	White-rumped Sandpiper	*Calidris fuscicollis*	Non-listed
Birds	White-tailed Ptarmigan	*Lagopus leucurus*	Non-listed
Birds	White-throated Sparrow	*Zonotrichia albicollis*	Non-listed
Birds	White-throated Swift	*Aeronautes saxatalis*	Non-listed
Birds	White-winged Crossbill	*Loxia leucoptera*	Non-listed
Birds	White-winged Scoter	*Melanitta fusca*	Non-listed
Birds	Whooping Crane	*Grus americana*	Federally endangered, state endangered
Birds	Wild Turkey	*Meleagris gallopavo*	Non-listed
Birds	Willet	*Catoptrophorus semipalmatus*	Non-listed
Birds	Williamson's Sapsucker	*Sphyrapicus thyroideus*	Non-listed
Birds	Willow Flycatcher	*Empidonax traillii*	Non-listed
Birds	Wilson's Phalarope	*Phalaropus tricolor*	Non-listed
Birds	Wilson's Warbler	*Wilsonia pusilla*	Non-listed
Birds	Winter Wren	*Troglodytes troglodytes*	Non-listed

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Group	Common Name	Scientific Name	Status
Birds	Wood Duck	*Aix sponsa*	Non-listed
Birds	Wood Thrush	*Hylocichla mustelina*	Non-listed
Birds	Yellow Warbler	*Dendroica petechia*	Non-listed
Birds	Yellow-billed Cuckoo	*Coccyzus americanus*	Non-listed
Birds	Yellow-breasted Chat	*Icteria virens*	Non-listed
Birds	Yellow-crowned Night-Heron	*Nyctanassa violacea*	Non-listed
Birds	Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	Non-listed
Birds	Yellow-rumped Warbler	*Dendroica coronata*	Non-listed
Mammals	Abert's Squirrel	*Sciurus aberti*	Non-listed
Mammals	American Badger	*Taxidea taxus*	Non-listed
Mammals	American Beaver	*Castor canadensis*	Non-listed
Mammals	American Elk	*Cervus elaphus*	Non-listed
Mammals	American Marten	*Martes americana*	Non-listed
Mammals	American Pika	*Ochotona princeps*	Non-listed
Mammals	Big Brown Bat	*Eptesicus fuscus*	Non-listed
Mammals	Big Free-tailed Bat	*Nyctinomops macrotis*	Non-listed
Mammals	Bighorn Sheep	*Ovis canadensis*	Non-listed
Mammals	Black Bear	*Ursus americanus*	Non-listed
Mammals	Black-footed Ferret	*Mustela nigripes*	Federally endangered, state endangered
Mammals	Black-tailed Jackrabbit	*Lepus californicus*	Non-listed
Mammals	Black-tailed Prairie Dog	*Cynomys ludovicianus*	State special concern
Mammals	Bobcat	*Lynx rufus*	Non-listed
Mammals	Bushy-tailed Woodrat	*Neotoma cinerea*	Non-listed
Mammals	Colorado Chipmunk	*Tamias quadrivittatus*	Non-listed
Mammals	Common Muskrat	*Ondatra zibethicus*	Non-listed
Mammals	Common Porcupine	*Erethizon dorsatum*	Non-listed

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Group	Common Name	Scientific Name	Status
Mammals	Coyote	*Canis latrans*	Non-listed
Mammals	Deer Mouse	*Peromyscus maniculatus*	Non-listed
Mammals	Desert Cottontail	*Sylvilagus audubonii*	Non-listed
Mammals	Dwarf Shrew	*Sorex nanus*	Non-listed
Mammals	Eastern Cottontail	*Sylvilagus floridanus*	Non-listed
Mammals	Eastern Spotted Skunk	*Spilogale putorius*	Non-listed
Mammals	Ermine	*Mustela erminea*	Non-listed
Mammals	Fox Squirrel	*Sciurus niger*	Non-listed
Mammals	Fringed Myotis	*Myotis thysanodes*	Non-listed
Mammals	Golden-mantled Ground Squirrel	*Spermophilus lateralis*	Non-listed
Mammals	Gray Fox	*Urocyon cinereoargenteus*	Non-listed
Mammals	Heather Vole	*Phenacomys intermedius*	Non-listed
Mammals	Hispid Pocket Mouse	*Chaetodipus hispidus*	Non-listed
Mammals	Hoary Bat	*Lasiurus cinereus*	Non-listed
Mammals	House Mouse	*Mus musculus*	Non-listed
Mammals	Least Chipmunk	*Tamias minimus*	Non-listed
Mammals	Least Shrew	*Cryptotis parva*	Non-listed
Mammals	Little Brown Myotis	*Myotis lucifugus*	Non-listed
Mammals	Long-eared Myotis	*Myotis evotis*	Non-listed
Mammals	Long-tailed Vole	*Microtus longicaudus*	Non-listed
Mammals	Long-tailed Weasel	*Mustela frenata*	Non-listed
Mammals	Lynx	*Lynx canadensis*	Federally threatened, state endangered
Mammals	Masked Shrew	*Sorex cinereus*	Non-listed
Mammals	Meadow Vole	*Microtus pennsylvanicus*	Non-listed
Mammals	Merriam's Shrew	*Sorex merriami*	Non-listed
Mammals	Mexican Woodrat	*Neotoma mexicana*	Non-listed

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Group	Common Name	Scientific Name	Status
Mammals	Mink	*Mustela vison*	Non-listed
Mammals	Montane Shrew	*Sorex monticolus*	Non-listed
Mammals	Montane Vole	*Microtus montanus*	Non-listed
Mammals	Moose	*Alces alces*	Non-listed
Mammals	Mountain Cottontail	*Sylvilagus nuttallii*	Non-listed
Mammals	Mountain Goat	*Oreamnos americanus*	Non-listed
Mammals	Mountain Lion	*Felis concolor*	Non-listed
Mammals	Mule Deer	*Odocoileus hemionus*	Non-listed
Mammals	Northern Grasshopper Mouse	*Onychomys leucogaster*	Non-listed
Mammals	Northern Pocket Gopher	*Thomomys talpoides*	Non-listed
Mammals	Northern River Otter	*Lutra canadensis*	State threatened
Mammals	Northern Rock Mouse	*Peromyscus nasutus*	Non-listed
Mammals	Olive-backed Pocket Mouse	*Perognathus fasciatus*	Non-listed
Mammals	Ord's Kangaroo Rat	*Dipodomys ordii*	Non-listed
Mammals	Pine Squirrel	*Tamiasciurus hudsonicus*	Non-listed
Mammals	Plains Harvest Mouse	*Reithrodontomys montanus*	Non-listed
Mammals	Plains Pocket Gopher	*Geomys bursarius*	Non-listed
Mammals	Prairie Vole	*Microtus ochrogaster*	Non-listed
Mammals	Preble's Meadow Jumping Mouse	*Zapus hudsonius preblei*	Federally threatened, state threatened
Mammals	Pronghorn	*Antilocapra americana*	Non-listed
Mammals	Pygmy Shrew	*Sorex hoyi*	Non-listed
Mammals	Raccoon	*Procyon lotor*	Non-listed
Mammals	Red Bat	*Lasiurus borealis*	Non-listed
Mammals	Red Fox	*Vulpes vulpes*	Non-listed
Mammals	Ringtail	*Bassariscus astutus*	Non-listed
Mammals	Rock Squirrel	*Spermophilus variegatus*	Non-listed

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Group	Common Name	Scientific Name	Status
Mammals	Sagebrush Vole	*Lemmiscus curtatus*	Non-listed
Mammals	Silky Pocket Mouse	*Perognathus flavus*	Non-listed
Mammals	Silver-haired Bat	*Lasionycteris noctivagans*	Non-listed
Mammals	Snowshoe Hare	*Lepus americanus*	Non-listed
Mammals	Southern Red-backed Vole	*Clethrionomys gapperi*	Non-listed
Mammals	Spotted Ground Squirrel	*Spermophilus spilosoma*	Non-listed
Mammals	Striped Skunk	*Mephitis mephitis*	Non-listed
Mammals	Swift Fox	*Vulpes velox*	Non-listed
Mammals	Thirteen-lined Ground Squirrel	*Spermophilus tridecemlineatus*	Non-listed
Mammals	Townsend's Big-eared Bat	*Plecotus townsendii*	State special concern
Mammals	Uinta Chipmunk	*Tamias umbrinus*	Non-listed
Mammals	Virginia Opossum	*Didelphis virginiana*	Non-listed
Mammals	Water Shrew	*Sorex palustris*	Non-listed
Mammals	Western Harvest Mouse	*Reithrodontomys megalotis*	Non-listed
Mammals	Western Jumping Mouse	*Zapus princeps*	Non-listed
Mammals	Western Small-footed Myotis	*Myotis ciliolabrum*	Non-listed
Mammals	Western Spotted Skunk	*Spilogale gracilis*	Non-listed
Mammals	White-tailed Deer	*Odocoileus virginianus*	Non-listed
Mammals	White-tailed Jackrabbit	*Lepus townsendii*	Non-listed
Mammals	White-tailed Prairie Dog	*Cynomys leucurus*	Non-listed
Mammals	Wolverine	*Gulo gulo*	State endangered
Mammals	Wyoming Ground Squirrel	*Spermophilus elegans*	Non-listed
Mammals	Yellow-bellied Marmot	*Marmota flaviventris*	Non-listed
Reptiles	Common Garter Snake	*Thamnophis sirtalis*	State special concern
Reptiles	Fence Lizard	*Sceloporus undulatus*	Non-listed
Reptiles	Gopher Snake	*Pituophis catenifer*	Non-listed

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Group	Common Name	Scientific Name	Status
Reptiles	Lesser Earless Lizard	*Holbrookia maculata*	Non-listed
Reptiles	Lined Snake	*Tropidoclonion lineatum*	Non-listed
Reptiles	Many-lined Skink	*Eumeces multivirgatus*	Non-listed
Reptiles	Midget Faded Rattlesnake	*Crotalus viridis concolor*	State special concern
Reptiles	Milk Snake	*Lampropeltis triangulum*	Non-listed
Reptiles	Northern Water Snake	*Nerodia sipedon*	Non-listed
Reptiles	Ornate Box Turtle	*Terrapene ornata*	Non-listed
Reptiles	Painted Turtle	*Chrysemys picta*	Non-listed
Reptiles	Plains Black-headed Snake	*Tantilla nigriceps*	Non-listed
Reptiles	Plains Garter Snake	*Thamnophis radix*	Non-listed
Reptiles	Racer	*Coluber constrictor*	Non-listed
Reptiles	Short-horned Lizard	*Phrynosoma hernandesi*	Non-listed
Reptiles	Six-lined Racerunner	*Cnemidophorus sexlineatus*	Non-listed
Reptiles	Smooth Green Snake	*Liochlorophis vernalis*	Non-listed
Reptiles	Snapping Turtle	*Chelydra serpentina*	Non-listed
Reptiles	Spiny Softshell	*Apalone spinifera*	Non-listed
Reptiles	Variable Skink	*Eumeces gaigeae*	Non-listed
Reptiles	Western Hognose Snake	*Heterodon nasicus*	Non-listed
Reptiles	Western Rattlesnake	*Crotalus viridis*	Non-listed
Reptiles	Western Terrestrial Garter Snake	*Thamnophis elegans*	Non-listed

Source: NDIS 2006

APPENDIX C

Fish Species Documented in the North I-25 EIS Regional Study Area

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Appendix C. Fish Species Documented in the North I-25 Study Area

Common Name	*Scientific Name*	Native or Introduced	Status
Bigmouth Shiner	*Notropis dorsalis*	Native	non-listed
Black Bullhead	*Ameiurus melas*	Native to eastern Colorado	non-listed
Black Crappie	*Pomoxis nigromaculatus*	Introduced	non-listed
Blacknose Shiner	*Notropis heterolepis*	Native	non-listed (extirpated)
Blue Catfish	*Ictalurus furcatus*	Introduced	non-listed
Bluegill	*Lepomis macrochirus*	Introduced	non-listed
Brassy Minnow	*Hybognathus hankinsoni*	Native	state threatened
Brook Stickleback	*Culaea inconstans*	Native	non-listed
Brook Trout	*Salvelinus fontinalis*	Introduced	non-listed
Brown Trout	*Salmo trutta*	Introduced	non-listed
Central Stoneroller	*Campostoma anomalum*	Native to eastern Colorado	non-listed
Channel Catfish	*Ictalurus punctatus*	Native to eastern Colorado	non-listed
Common Carp	*Cyprinus carpio*	Introduced	non-listed
Common Shiner	*Notropis luxilus cornutus*	Native	state threatened
Creek Chub	*Semotilus atromaculatus*	Native	non-listed
Fathead Minnow	*Pimephales promelas*	Native to eastern Colorado	non-listed
Gizzard Shad	*Dorosoma cepedianum*	Native	non-listed
Golden Shiner	*Notemigonus crysoleucas*	Introduced	non-listed
Goldfish	*Carassius auratus*	Introduced	non-listed
Green Sunfish	*Lepomis cyanellus*	Native	non-listed
Hybrid Bluegill	*Lepomis macrochirus X unknown*	Introduced	non-listed
Hybrid Grass Carp	*Ctenopharyngodon idella X unknown*	Introduced	non-listed
Hybrid Sunfish	*Lepomis cyanellus X unknown*	Introduced	non-listed
Iowa Darter	*Etheostoma exile*	Native	state special concern
Johnny Darter	*Etheostoma nigrum*	Native	non-listed
Largemouth Bass	*Micropterus salmoides*	Introduced	non-listed
Longnose Dace	*Rhinichthys cataractae*	Native	non-listed
Longnose Sucker	*Catostomus catostomus*	Native to eastern Colorado	non-listed
Mountain Whitefish	*Prosopium williamsoni*	Introduced*	non-listed
Northern Pike	*Esox lucius*	Introduced	non-listed

Appendix C. Fish Species Documented in the North I-25 Study Area

Common Name	*Scientific Name*	Native or Introduced	Status
Northern Redbelly Dace	*Phoxinus eos*	Native	State threatened
Orangespotted Sunfish	*Lepomis humilis*	Native to eastern Colorado	Non-listed
Plains Killfish	*Fundulus zebrinus*	Native	Non-listed
Plains Minnow	*Hybognathus placitus*	Native	State endangered
Plains Topminnow	*Fundulus sciadicus*	Native	Non-listed
Pumpkinseed	*Lepomis gibbosus*	Native to eastern Colorado	Non-listed
Rainbow Trout	*Oncorhynchus mykiss*	Introduced	Non-listed
Red Shiner	*Cyprinella lutrensis*	Native	Non-listed
Sand Shiner	*Notropis stramineus*	Native to eastern Colorado	Non-listed
Smallmouth Bass	*Micropterus dolomieui*	Introduced	Non-listed
Snake River Cutthroat	*Oncorhynchus clarki behnke*	Introduced	Non-listed
Spottail Shiner	*Notropis hudsonius*	Introduced	Non-listed
Stonecat	*Noturus flavus*	Native	State special concern
Suckermouth Minnow	*Phenacobius mirabolis*	Native	State endangered
Tiger Muskie (npk x msk hybrid)	*Esox lucius X E. masquinongy*	Introduced	Non-listed
Walleye	*Stizostedion vitreum*	Introduced	Non-listed
Western Mosquitofish	*Gambusia affinis*	Introduced	Non-listed
White Bass	*Morone chrysops*	Introduced	Non-listed
White Crappie	*Pomoxis annularis*	Introduced	Non-listed
White Longnose Hybrid	*Catostomus commersoni X C. catostomus*	Native to eastern Colorado	Non-listed
White Sucker	*Catostomus commersoni*	Native to eastern Colorado	Non-listed
Wiper (Palmetto Bass)	*Morone chrysops (m) X M. saxatilis (f)*	Introduced	Non-listed
Yellow Bullhead	*Ameiurus natalis*	Introduced	Non-listed
Yellow Perch	*Perca flavescens*	Introduced	Non-listed

[*]Native to White and Yampa Rivers, Introduced to Cache la Poudre River.
Source: CDOW 2005b.

APPENDIX D

Recommended Buffer Zones for Colorado Raptors

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APPENDIX D

RECOMMENDED BUFFER ZONES AND SEASONAL RESTRICTIONS FOR COLORADO RAPTOR NESTS

*These zones and seasonal restrictions are recommended as guidance and may be subject to change. They do not represent official Division policy

Prepared By
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Updated 1/18/02

Tolerance limits to disturbance varies among as well as within raptor species. As a rule, ferruginous hawks and golden eagles respond at greater distances to human activities than do ospreys and kestrels. Some individuals within a species also habituate and tolerate human activity at a proximity that would cause the majority of the species to abandon their nests. Other individuals become sensitized to repeated encroachment and react at greater distances. The tolerance of a particular pair may change when a mate is replaced with a less tolerant individual and may cause the pair to react to activities that were previously ignored. Responses will also vary depending upon the reproductive stage. Although the level of stress is the same, the pair may be more sensitive during egg laying and incubation and more demonstrative when the chicks hatch.

The term "disturbance" is also ambiguous and experts disagree on what actually constitutes a disturbance. Reactions may be as subtle as elevated pulse rate and as extreme as vigorous defense or abandonment. Impacts of disturbance may not be immediately evident. A pair of raptors may respond to human intrusion by defending the nest, but well after the disturbance has passed, the male may remain in the vicinity for protection rather than forage to feed the nestlings, Golden Eagles rarely defend their nests, but merely fly a half mile or more away and perch and watch. Chilling and over heating of eggs or chicks and starvation of nestlings can result from human activities that appeared not to have caused an immediate response.

A ‘holistic’ approach is recommended when protecting raptor habitat. While it is important for land managers to focus on protecting nest sites, equal attention should focus on defining important foraging areas that support the pairs nesting effort. Hunting habitat of many raptor species are extensive and may necessitate interagency cooperation to assure the continued nest occupancy. Unfortunately, basic knowledge of habitat use is lacking and may require documentation through telemetry investigations or intensive observation. Telemetry is expensive and may be disruptive so a more practical approach is to assume that current open space is important and should be protected.

Although there are exceptions, the buffer areas and seasonal restrictions suggested here reflect an informed opinion that if implemented, should assure that the majority of individuals within a species will continue to occupy the area. Measurements are somewhat imprecise (fractions of a

mile) and reflect the need to maintain some flexibility to adjust buffer zones depending upon intervening terrain and vegetation screens that obscure the activity, This document is intended to be modified and refined as additional information becomes available, hence the need for a revision date.

BALD EAGLE,

Nest Site:

Year round closure to surface occupancy *(beyond that which historically occurred in the area) within 1/4 mile radius of nest. No human encroachment from November 15 through July 31 within 1/2 mile radius of the nest. This closure is more extensive than the Northern-States Bald Eagle Recovery Plan due to the generally open habitat used by Colorado's nesting bald eagles. Aside from four Colorado sites in coniferous forests, all others are in cottonwood riparian zones that don't have the vegetational density, and therefore obscurity offered by the habitats in the lake states. Recent evidence suggests that pairs nesting at lower elevations frequent and maintain their nests throughout the year. If it is necessary to work within the ½ mile buffer, the intrusion should be restricted to August 15 through October 15.

Winter Night Roost:

Activity should be eliminated within 1/4 mile radius of winter roosts between November 15 and March 15. If periodic visits (such as oil well maintenance work) are required within the buffer zone after development, activity should be restricted to the period between 1000 and 1400 hours from November 15 to Match 15. Limited restrictions may be necessary out to 1/2 mile if there is a direct line of sight from the roost to the activities.

Hunting Perch:

Diurnal Perches associated with important foraging areas should also be protected from human encroachment. Preferred perches may be at varying distances from human encroachment and buffer areas will vary. However, at least 2 management plans recommend zones that range from 1/8 mile (200 meters) to ¼ mile (400 meters) depending upon topographic or vegetational screening.

GOLDEN EAGLE

Nest Site:

No surface occupancy * (beyond that which historically occurred in the area) within 1/4 mile radius of the nest site and associated alternate nests. Seasonal restriction to human encroachment within 1/4 mile of the nest and any alternate nests from February 1 to July 15.

OSPREY

Nest Site:

No surface occupancy * (beyond that which historically occurred in the area) within 1/4 mile of the nest site. Seasonal restriction to human encroachment within 1/4 mile of the nest from April 1 to August 31. Some osprey populations have habituated and are tolerant to human activity in the immediate vicinity of their nests.

* Surface occupancy means non-human habitation, examples would be oil and gas wells, roads, tracks, trails, etc.

FERRUGINOUS HAWK

Nest Site:

No surface occupancy * (beyond that which historically occurred in the area) within 1/2 mile radius of the nest site, and associated alternate nests. Seasonal restriction to human encroachment within 1/4 mile of the nest and any alternate nests from February 1 to July 15. This species is especially prone to nest abandonment during incubation if disturbed.

RED-TAILED HAWK

Nest Site:

No surface occupancy * (beyond that which historically occurred in the area) within 1/3 mile radius of the nest site, and associated alternate nests. Some members of this species have adapted to urbanization and may tolerate human habitation to within 200 yards of their nest. Development that encroaches on rural sites is likely to cause abandonment. Seasonal restriction to human encroachment should be in effect from March 1 to July 15.

SWAINSON'S HAWK

Nest Site:

No surface occupancy * (beyond that which historically occurred in the area) within 1/4 mile radius of the nest site, and associated alternate nests. Some members of this species have adapted to urbanization and may tolerate human habitation to within 100 yards of their nest. Seasonal restriction to human encroachment within 1/4 mile of the nest from April 1 to July 15.

PEREGRINE FALCON

Nest Site:

No surface occupancy * (beyond that which historically occurred in the area) within 1/2 mile of the nest site. Seasonal restriction to human encroachment within 1/2 mile of the nest cliff(s) from March 15 to July 31. A 1-mile buffer with a closure from February 1 to August 31 was originally stipulated in the approved Recovery Plan, but recent field evidence suggests that the zone can be reduced to 1/2 mile. Due to propensity to relocate nest sites, sometimes up to 1/2 mile along cliff faces, it is more appropriate to designate 'Nesting Areas' that encompass the cliff system and a 1/2-mile buffer around the cliff complex.

PRAIRIE FALCON

Nest Site:

No surface occupancy * beyond that which historically occurred in the area) within 1/2 mile radius of the nest site.

NORTHERN GOSHAWK

Reynolds- et al- (1993) proposed 30 acres for the nest, a post fledging family area of 420 acres, and a foraging area of 5400 acres in size that encompasses habitat for squirrels, rabbits, jays, woodpeckers and grouse. For purposes here, it seems that a buffer of 1/2 mile around the nest should protect the integrity of the nesting and post fledging area. Occupancy of the nesting and brood rearing area takes place from early March through late September.

* Surface occupancy means non-human habitation, examples would be oil and gas wells, roads, tracks, trails, etc.

BURROWING OWL

Nest Site:

No human encroachment or disturbance within 75 yards of the nest site from April 1 through July 31. This period is necessary to avoid disturbing nesting owls. However, owls may be present at burrows up to a month before egg laying and several months after young have fledged. Therefore it is recommended that efforts to eradicate prairie dogs or destroy abandoned towns not occur between March 1 and October 31 when owls may be present. Although owls may occur throughout a prairie dog colony, there is a propensity for them to frequent the colony margins and buffer zones should be applied to the colony perimeter. Measures that protect and enhance prairie dog colonies will benefit this species.

Buffers Documented in the Literature

Species	**Period**		**Optimal Distance**	**Authority**
	Incubation	Brood		
Ferruginous Hawk	380-488 yd.	619-781 yd.	781 yd. (.45 mi.)	Holmes
Red-tailed Hawk	448-553 yd.	428-604 yd.	604 yd. (.34 mi.)	Holmes
Swainson's Hawk	171-203 yd.	309-382 yd.	382 yd. (.22 mi.)	Holmes
Prairie Falcon	500-1000 m 546-1093 yd.		1000m 1093 yd (.62 mi.)	Holthuijzen et al.

Perch Buffers

The following buffers for perches were recommended by T. Holmes (1994) to prevent flushing of 90 % of raptors wintering in rangeland and agricultural habitats.

SPECIES	BUFFER AREA (Radius)
American Kestrel	75m
Merlin	125m
Prairie Falcon	160m
Rough-legged Hawk	210m
Ferruginous Hawk	140m
Golden Eagle	300m

* Surface occupancy means non-human habitation, examples would be oil and gas wells, roads, tracks, trails, etc.

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* Surface occupancy means non-human habitation, examples would be oil and gas wells, roads, tracks, trails, etc.

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