CDOT PROJECT IM 0703-294

I-70/32nd AVENUE INTERCHANGE ENVIRONMENTAL ASSESSMENT

WILDLIFE TECHNICAL REPORT

Prepared for:

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LIST OF ABBREVIATIONS AND ACRONYMS

BCC	Bear Canyon Consulting, LLC
CDOT	Colorado Department of Transportation
CDOW	Colorado Division of Wildlife
CNHP	Colorado Natural Heritage Program
EA	Environmental Assessment
FHU	Felsburg Holt & Ullevig
FHWA	Federal Highway Administration
I-70	U.S. Interstate Highway 70
LLC	Limited Liability Corporation
LRT	Golden Light Rail
NEPA	National Environmental Policy Act
NRSI	Natural Resource Services, Inc.
ROW	Right of Way
RTD	Regional Transportation District
SH 58	Colorado State Highway 58
USGS	United States Geological Survey
UTM	Universal Transverse Mercator

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1.0 INTRODUCTION

In accordance with the National Environmental Policy Act of 1969 (NEPA) and its related regulations, the Federal Highway Administration (FHWA), as the Lead Agency, in cooperation with the Colorado Department of Transportation (CDOT) as the Applicant Agency, is preparing an Environmental Assessment (EA) for proposed improvements to the Interstate 70 (I-70)/32nd Avenue interchange (the Proposed Action). The project is proposed by the City of Wheat Ridge. Natural Resource Services, Inc. (NRSI) was contracted on August 30, 2005 by Felsburg Holt & Ullevig (FHU), acting on behalf of CDOT and the City of Wheat Ridge, to conduct environmental assessments for the I-70/32nd Avenue Interchange EA. The detailed information included in this report is intended to support the EA document and the associated local agency projects to be completed by the City of Wheat Ridge. A summarized version of this report was incorporated into the EA.

In September, 2005, Bear Canyon Consulting, LLC (BCC), under contract to NRSI, conducted an assessment of wildlife species expected to utilize the I-70/32nd Street Interchange EA study area. This document describes the methods employed and reports the survey results to include the ecological and wildlife habitat management context and mitigation suggestions.

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2.0 PROJECT LOCATION

The I-70/32nd Avenue interchange project is located in the western part of the Denver metropolitan area, as shown in **Figure 2-1**. The project area falls partially within the cities of Wheat Ridge and Lakewood and within unincorporated Jefferson County. The City of Arvada is located north of the project area, and the City of Golden is located west of the project area. The project area boundaries is shown in **Figure 2-2**.

The project area includes about two miles of I-70 from 26th Avenue to Ward Road and two miles of SH 58 from McIntyre Street to I-70 (see **Figure 2-2**). The general coordinates are 39º 46' 00" N latitude and 105º 09' 00" W longitude (UTM Zone 13 487,500E and 4,402,000N). The study area can be found on the U.S. Geological Survey (USGS) Golden, CO 7.5 minute topographic quadrangle at the following locations:

- SE1/4 of Section 24 in Township 3 South, Range 70 West of the 6th Prime Meridian, Golden, Colorado quadrangle
- NE1/4 of Section 25 in Township 3 South, Range 70 West of the 6th Prime Meridian, Golden, Colorado quadrangle
- S1/2 of Section 19, Township 3 South, Range 69 West of the 6th Prime Meridian Golden, Colorado quadrangle
- NW1/4SW1/4 of Section 20, Township 3 South, Range 69 West of the 6th Prime Meridian Golden, Colorado quadrangle
- W1/2 of Section 29, Township 3 South, Range 69 West of the 6th Prime Meridian, Golden, Colorado quadrangle
- N1/2 of Section 30, Township 3 South, Range 69 West of the 6th Prime Meridian Golden, Colorado quadrangle
- NW1/4 of Section 32, Township 3 South, Range 69 West of the 6th Prime Meridian, Golden, Colorado quadrangle

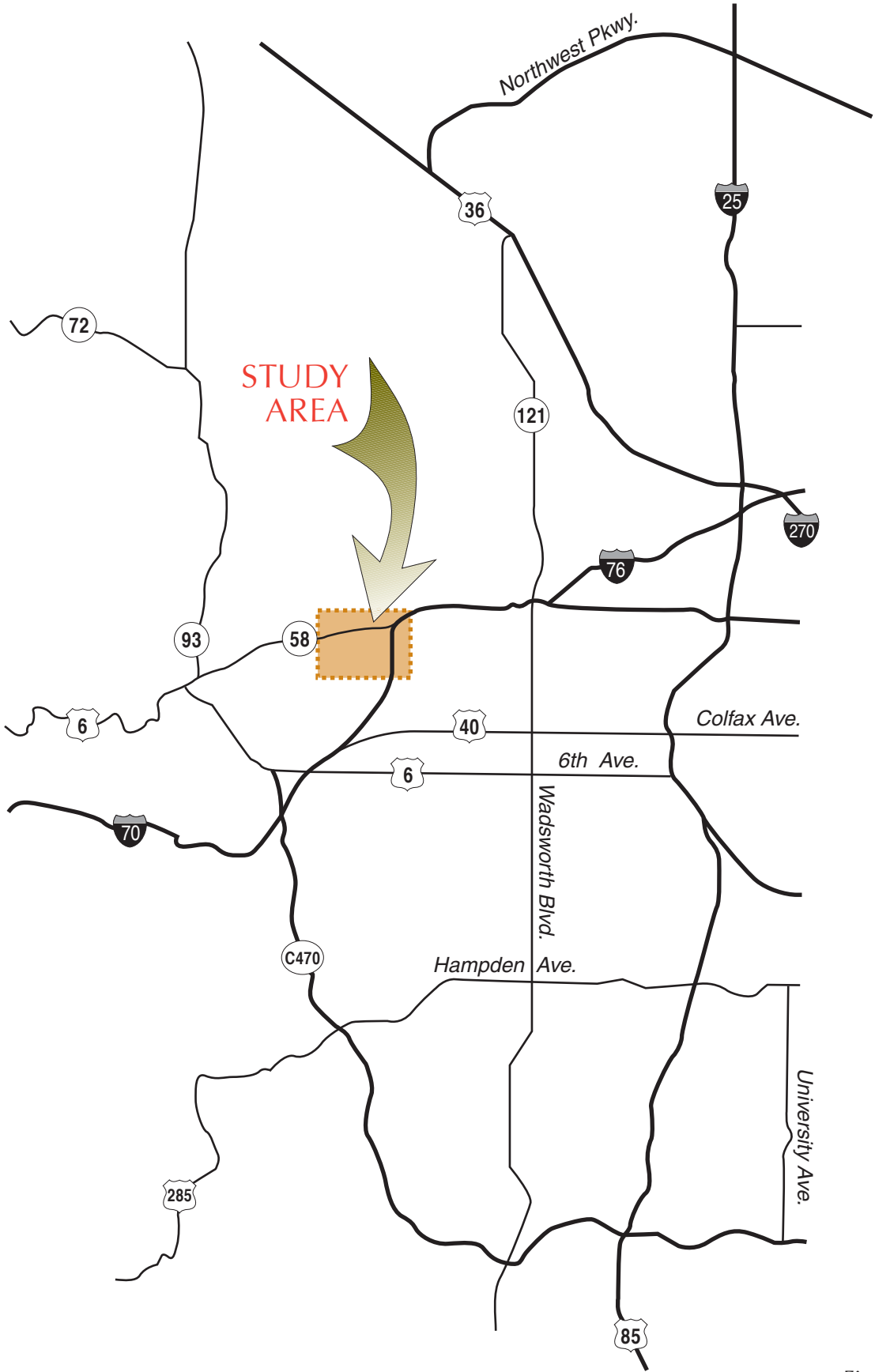

Figure 2-1
Project Location

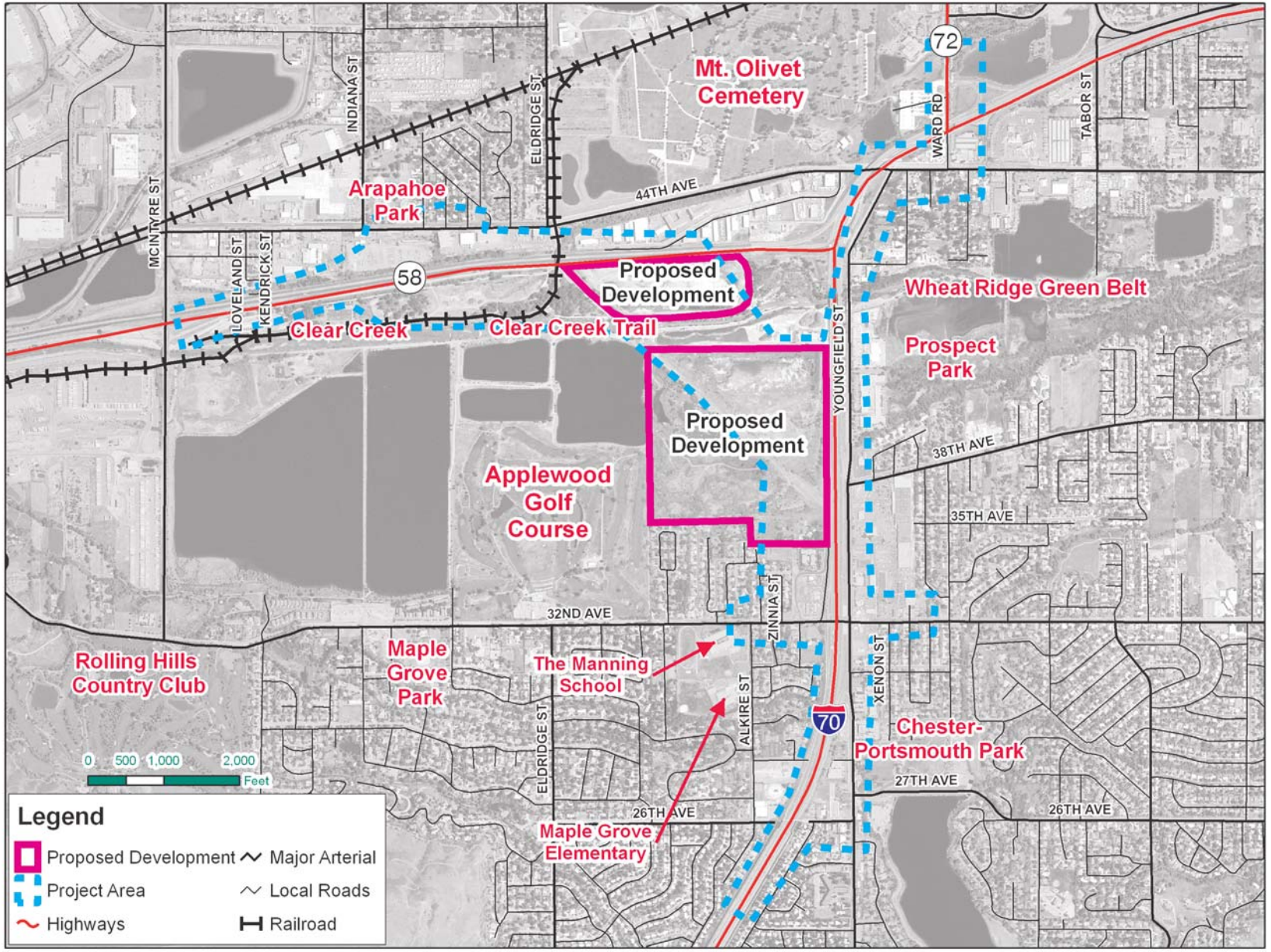

Figure 2-2

Project Area

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3.0 PROJECT DESCRIPTION

The I-70/32nd Avenue interchange improvement process began with the development of a broad range of alternatives to address potential effects on traffic operations by regional growth and a proposed development located southwest of the I-70/SH 58 interchange. The *I-70/32nd Avenue Interchange System Level Feasibility Study* (FHU 2005) examined 21 alternatives and nine sub-alternatives. The System Level Feasibility Study, which was approved by the Colorado Transportation Commission in September 2005, advanced three alternative packages for further study in the EA. Technical screening and evaluation narrowed down the list of alternatives and resulted in identification of the Proposed Action.

3.1 Proposed Action

The Proposed Action is shown on **Figure 3-1** and consists of the following series of elements:

- **New I-70/32nd Avenue Interchange Hook Ramps**
  - Construction of off-set hook ramps at the I-70/32nd Avenue interchange with the westbound hook ramps located north of 32nd Avenue at approximately 35th Avenue and the eastbound hook ramps located at Youngfield Street and 27th Avenue
  - Construction of a third I-70 bridge over 32nd Avenue for merging westbound traffic
  - Closure of the existing westbound I-70 off-ramp that exits to 32nd Avenue. The existing westbound I-70 on-ramp would remain open but access would be limited to eastbound 32nd Avenue traffic only
  - Reconstruction and restriping of Youngfield Street between 27th Avenue and approximately 30th Avenue to achieve a 5-lane roadway section

- **32nd Avenue Improvements**
  - Widening of 32nd Avenue between approximately Alkire Street and approximately Xenon Street and the widening of Youngfield Street between approximately 35th Avenue and 30th Avenue in the vicinity of the I-70/32nd Avenue interchange
  - Connection of Cabela Drive with 32nd Avenue west of I-70 (40th Avenue to 32nd Avenue)

- **New SH 58/Cabela Drive Interchange**
  - Construction of a new diamond interchange on SH 58 west of Eldridge Street and connection of Cabela Drive to this interchange
  - Connection of Cabela Drive with 44th Avenue north of the new interchange on SH 58

- **I-70/Ward Road Interchange**
  - Restriping of the Ward Road and westbound I-70 on-ramp intersection to add an additional southbound left turn lane onto the ramp and widen the ramp to receive this lane
  - Addition of a second right-turn lane for the eastbound I-70/Ward Road off-ramp

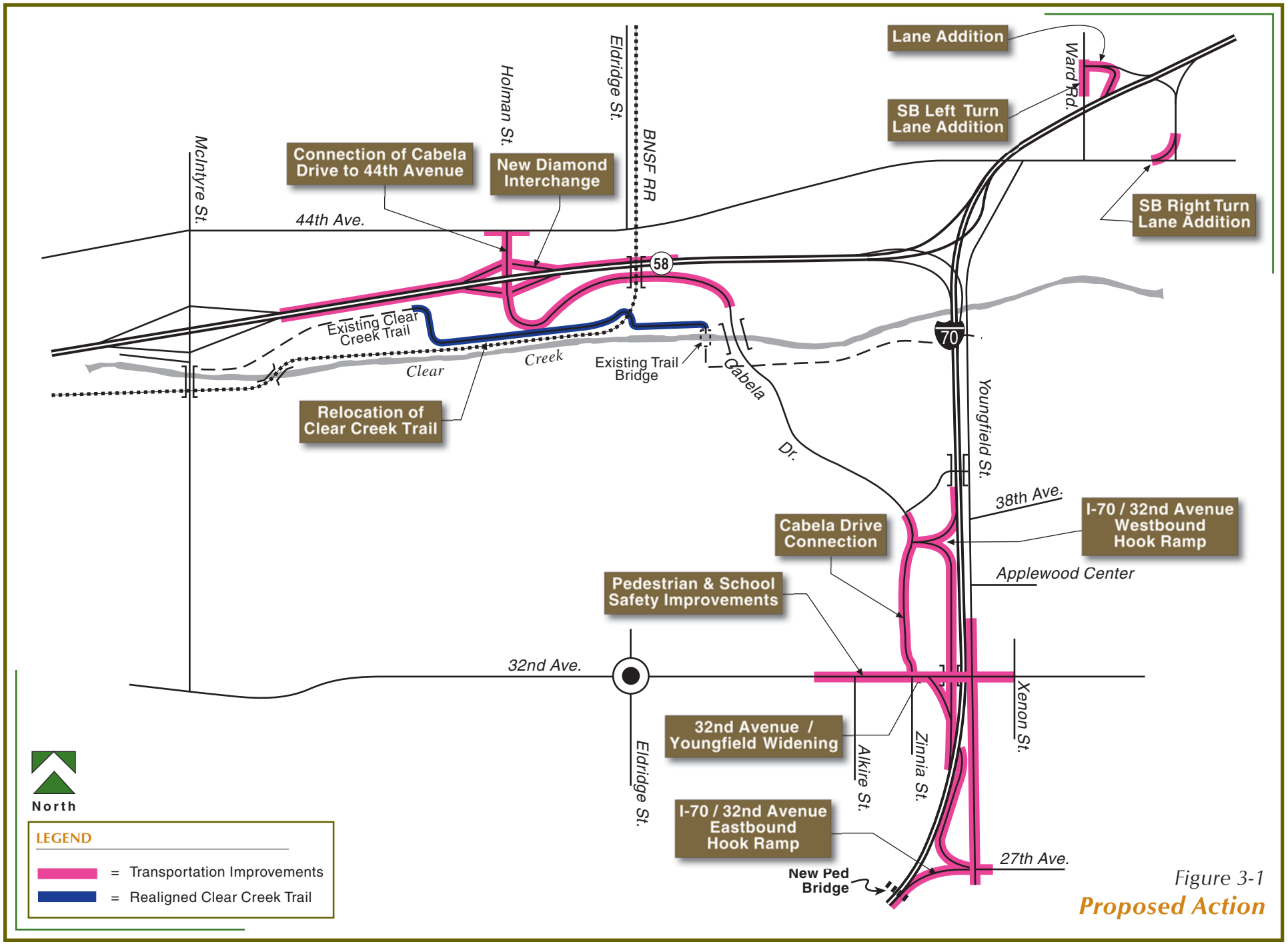

Figure 3-1

Proposed Action

- **Bicycle/Pedestrian Improvements**

  - Relocation of the Jefferson County Open Space Clear Creek Trail in the vicinity of the new SH 58/Cabela Drive interchange
  - Replacement of the 32nd Avenue trail detached sidewalk along the south side of 32nd Avenue from Alkire Street to Cabela Drive with an attached sidewalk
  - Improvements to pedestrian and school safety along 32nd Avenue
  - Construction of an Americans with Disabilities Act (ADA) compliant pedestrian bridge at 27th Avenue to replace the existing pedestrian bridge at 26th Avenue as part of the eastbound I-70 hook ramps
  - Provisions for Jefferson County Open Space Clear Creek Trail access through the development site from 32nd Avenue
  - Wider sidewalks under I-70 on the south side of 32nd Avenue to better accommodate bicycles and pedestrians

3.2 Local Agency Projects

The City of Wheat Ridge submitted an application to CDOT for construction of a series of local agency projects that are common to each of the three alternative packages presented in the System Level Feasibility Study and that would be independent and stand on their own merits should no other improvements take place. The local agency projects do not preclude any of the alternatives evaluated in the EA. The local agency projects include:

- Construction of the 40th Avenue underpass of I-70
- Widening of Youngfield Street from 38th Avenue to 44th Avenue
- Construction of Cabela Drive from 40th Avenue to the proposed development ust north of Clear Creek

These local agency projects are to be completed by the City of Wheat Ridge as separate projects that are not dependent on the interchange improvements or on federal funding and thus have been included in the travel demand forecasting for the traffic analysis. Access approval through a Categorical Exclusion allowed access to interstate right-of-way to accommodate the 40th Avenue underpass of I-70 and the widening of Youngfield Street from 38th Avenue to 44th Avenue. Cabela Drive from 40th Avenue to the proposed development just north of Clear Creek is a local agency project and can proceed without FHWA and CDOT approval. As a local agency action not requiring CDOT right-of-way, FHWA/CDOT approval for construction of Cabela Drive from 40th Avenue to the proposed development just north of Clear Creek is not required; however, environmental permitting for these projects such as the Clean Water Act and other relevant environmental regulations will be the responsibility of the local agency or developer.

3.2.1 Youngfield Street Widening from 38th Avenue to 44th Avenue

The widening of Youngfield Street would occur from 38th Avenue north to 44th Avenue. From 32nd Avenue north to 38th Avenue, Youngfield Street is already a five lane facility; the widening of Youngfield Street would extend this cross-section further north to its terminus at 44th Avenue. The widening of Youngfield Street from 38th to 44th Avenue, from its current two lane configuration, would incorporate two additional through lanes in each direction and a center left turn lane at intersections.

The bridge over Clear Creek on Youngfield Street is wide enough for four lane usage, but currently only two lanes are being used. The barriers blocking the additional two lanes on the bridge would be removed and the bridge would begin to function as four 12-foot lanes.

The Youngfield Street improvements would also incorporate needed turn lanes at the 44th Avenue intersection such that double left turn lanes from westbound 44th Avenue and double right turn lanes from northbound Youngfield Street can be accommodated. These turn lane additions are also a common element to the three short-listed alternative packages.

3.2.2 40th Avenue Underpass of I-70

The 40th Avenue underpass of I-70 is proposed to be four lanes with a 10-foot sidewalk on the north side. Three lanes and the sidewalk would be initially constructed: one inbound to the proposed development and two outbound to Youngfield Street. Depending on the final extension of Cabela Drive to 32nd Avenue, this design could change slightly. The underpass would be designed to accommodate the potential future widening of I-70 and would accommodate all the improvements planned for the I-70 and SH 58 build out project by CDOT.

The 40th Avenue underpass would intersect with the Youngfield Service Road, creating an at-grade signed “T” intersection with the segment north of 40th Avenue. The southern segment of the Youngfield Service Road would not connect to 40th Avenue, but would continue to provide access to businesses located immediately north of 32nd Avenue on the service road. Access to the Jefferson County Open Space Clear Creek Trail would occur from the east via Youngfield Street through the 40th Avenue underpass to the northern portion of the Youngfield Service Road, and from the west via the proposed development roadway network.

3.2.3 Cabela Drive from 40th Avenue to just north of Clear Creek

The construction of Cabela Drive would include a portion of 40th Avenue extending from the 40th Avenue underpass to the west where 40th Avenue would intersect with Cabela Drive, which is a north-south roadway. 40th Avenue is proposed to be a four lane facility with adjacent sidewalks through the proposed development site. From the Cabela Drive/40th Avenue intersection to the proposed development just north of Clear Creek, Cabela Drive would consist of four through lanes with a center turn lane and adjacent sidewalks. The Clear Creek Bridge crossing of Cabela Drive would include three through lanes transitioning to a three through lane facility with a center turn lane north of Clear Creek. The proposed crossing of the Jefferson County Open Space Clear Creek Trail, south of Clear Creek, would be grade separated.

4.0 ECOLOGICAL SETTING

The ecological setting includes an urban riparian corridor along Clear Creek at the base of the foothills of the Colorado Front Range. It also includes associated ditches and a narrow strip of more xeric mixed grasslands and rubber rabbitbrush *(Chrysothamnus nauseous)* dominated shrublands that provide habitat for a variety of wildlife species including grassland birds, and mammals.

The stream bed of Clear Creek is composed largely, of quaternary alluvium. Most soils within the study area are classified as torrifluvents. These are gravelly, deep, excessively drained soils which have poor water holding capabilities (Price and Amen 1980). Today, Clear Creek is highly channelized and is largely isolated from its floodplain (Arbogast et al. 2000). Only significant flood events are likely to result in flooding within the floodplain.

The creek functions as an east-west wildlife movement corridor and provides habitat for a wide range of vegetative and wildlife species. It provides a continuous connection between habitats in the foothills and mountains to the west, including North Table Mountain Open Space and South Table Mountain, and the Wheat Ridge Greenbelt immediately to the east. This connectivity is illustrated by the fact that both cougars and black bears have been observed in the city of Wheat Ridge along the Greenbelt (Anderson and Stevens 2000; City of Wheat Ridge and ERO Resources Corporation 2002).

Although affected by fragmentation and development, the reach of Clear Creek and associated habitats within the study area support a diverse array of wildlife. In an arid setting, this riparian area attracts a variety of animal species, many of which are dependant on wetlands for all or part of their life cycles.

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5.0 METHODS

BCC conducted a thorough review of the literature, interviewed Colorado Division of Wildlife (CDOW) and Colorado Natural Heritage Program (CNHP) officials in preparation for field work in the wildlife study area (see **Figure 5-1**). A preliminary list of amphibian, reptile, bird, and mammal species likely to utilize the study area was compiled from the CDOW Natural Diversity Information Source database for Jefferson County (Colorado Division of Wildlife 2005) and through consultation with CDOW. This list was then edited by the researchers by comparing individual species needs as found in the literature (Fitzgerald et al. 1994; Hammerson 1999, Kingery 1998, and Woodling 1985) with habitat types present within the study area. The likelihood of occurrence of each species in the study area was determined by the presence of suitable habitat, known distribution records, and relative abundance. Paul Winkle, Colorado Division of Wildlife fisheries biologist, also provided a list of fish species likely to occur in the study area (see **Appendix A**).

The study area was systematically surveyed on foot by Anne Ruggles, Senior Biologist, and Melissa Reed-Eckert, Wildlife Biologist, both with BCC, on September 1, 22, 23, and 26, 2005. Weather conditions were mild and sunny during most of the survey periods. No trapping or photo surveys were undertaken. The study area was searched not only for identifiable individuals, but also for sign including tracks, scats, chewings, rubbings, nests, burrows, scent posts, carcasses, etc. All pertinent observations were documented, collected if appropriate, or photographed. Final lists of potential species with indications of actual observations within the study or its immediate vicinity are found in **Tables 5-1 through 5-4**.

Table 5-1 Identified Fish Species

Common Name	Scientific Name	Confirmed*	Front Range/Denver Metro Habitat
Longnose Sucker	*Catostomus catastomus*		Habitat generalist.
White Sucker	*Catostomus commersoni*	X	Habitat generalist.
Common Carp	*Cyprinus carpio*		Habitat generalist.
Iowa Darter	*Etheostoma exile*		Cool, clear, slow moving water over a sand or organic matter substrate.
Green Sunfish	*Lepomis cyanellus*		Streams and impoundments
Pumpkinseed	*Lepomis gibbosus*		Impoundments.
Bluegill	*Lepomis macrochirus*		Shallow warm water impoundments and slow-flowing rivers and streams.
Smallmouth Bass	*Micropterus dolomieui*		Introduced.
Largemouth Bass	*Micropterus salmoides*		Introduced. Warmwater impoundments.
Common Shiner	*Notropis cornutus*	X	Stocked in holding ponds and mitigation wetlands on the study area.**
Sand Shiner	*Notropis stramineus*		Permanent plains streams with sandy bottoms.
Northern Redbelly Dace	*Phixinus eos*	X	Stocked in holding ponds and mitigation wetlands on the study area.**
Flathead Minnow	*Pimephales promelas*	X	Habitat generalist.
Longnose Dace	*Rhinichthys cataractae*		Riffle areas of streams with rubble or gravel substrate.
Rainbow Trout	*Salmo gairdneri*		Introduced.
Brown Trout	*Salmo trutta*		Introduced habitat generalist.
Creek Chub	*Semotilus atromaculatus*		Habitat generalist.

* Observed in the study area by Bear Canyon Consulting, LLC or Natural Resource Services, Inc. personnel.
** Winkle (2005).

Table 5-2 Identified Amphibian and Reptile Species

Common Name	Scientific Name	Confirmed*	Front Range/Denver Metro Habitat
Amphibians:			
Tiger Salamander	*Ambystoma tigrinum*		Habitat generalist near permanent or ephemeral pond.
Great Plains Toad	*Bufo cognatus*		Sandhills, grasslands, and agricultural areas along floodplains, generally below 6,000 ft.
Woodhouse's Toad	*Bufo woodhousii*	X	River valleys, floodplains and irrigated agricultural lands with deep soils, below 7,000 ft.
Western Chorus Frog	*Pseudacris triseriata*		Lowland non-flowing bodies of water and upland water edges and nearby wet meadows.
Bullfrog	*Rana catesbeiana*	X	Non-native. Quiet streams and ditches, pools, ponds, marshes and reservoirs.
Northern Leopard Frog	*Rana pipiens*		Wet meadows, streams and ditches, ponds, marshes, and reservoirs.
Plains Spadefoot	*Spea bombifrons*		Sandhills and plains grassland.
Reptiles:			
Spiny Softshell	*Apalone spinifera*		Lowland riparian on rivers, streams, and intermittent creeks with permanent pools.
Snapping Turtle	*Chelydra serpentina*		Lowland riparian on streams, creeks with temporary pools, lakes, ponds, and reservoirs.
Painted Turtle	*Chrysemys picta*		Lowland ponds, marshes, river backwaters, and slow moving stretches of streams.
Six Lined Race Runner	*Cnemidophorus sexlineatus*	X	Prairie grassland, sand or gravelly banks and floodplains of streams.
Racer	*Coluber constrictor*		Grassland, open foothill and lowland riparian woodlands, shrubby foothills and canyons.
Western Rattlesnake	*Crotalus viridis*		Habitat generalist.
Many-lined Skink	*Eumeces multivirgatus*		Lowland habitats with loose sandy soil and prairie dog towns.
Western Hognose Snake	*Heterodon nasicus*		Sandhills, plains grassland, and sandy floodplains near streams, ditches, or ponds.
Lesser Earless Lizard	*Holbrookia maculata*		Sandhills, sandy or gravelly areas along streams, grassland with expanses of bare ground.
Milk Snake	*Lampropeltis triangulum*		Dryland habitat generalist generally below 8,000 ft.
Smooth Green Snake	*Liochlorophis vernalis*		Mountain and foothill riparian.
Northern Water Snake	*Nerodia sipedon*		Lowland riparian along major drainage systems.
Short-horned Lizard	*Phrynosoma hernandesi*		Dry upland, foothill, and lowland habitat generalist.
Gopher Snake	*Pituophis catenifer*		Upland, foothill, and lowland habitat generalist below 8,500 ft.
Fence Lizard	*Sceloporus undulatus*	X	Sunny, rocky habitats below 7,500 ft.
Plains Black-headed Snake	*Tantilla nigriceps*		Sandhills, plains grassland, foothills, rocky canyons.
Ornate Box Turtle	*Terrapene ornata*		Non-native. Introduced to lowland riparian along the Front Range.
Western Terrestrial Garter Snake	*Thamnophis elegans*		Habitat generalist often in the vicinity of any flowing or non-flowing body of water.
Plains Garter Snake	*Thamnophis radix*	X	Plains and foothill riparian generalist.
Common Garter Snake	*Thamnophis sirtalis*		Marshes, ponds, and stream edges; seldom found away from water or at isolated ponds.
Lined Snake	*Tropidoclonion lineatum*		Riparian and damp plains and canyon bottom grasslands below 6,000 ft.

* Observed in the study area by Bear Canyon Consulting, LLC or Natural Resource Services, Inc. personnel.

Table 5-3 Identified Bird Species

Common Name	Scientific Name	Confirmed*	Front Range/Denver Metro Habitat
Amphibians			
Tiger Salamander	*Ambystoma tigrinum*		Habitat generalist near permanent or ephemeral pond.
Great Plains Toad	*Bufo cognatus*		Sandhills, grasslands, and agricultural areas along floodplains, generally below 6,000 ft.
Woodhouse's Toad	*Bufo woodhousii*	X	River valleys, floodplains and irrigated agricultural lands with deep soils, below 7,000 ft.
Western Chorus Frog	*Pseudacris triseriata*		Lowland non-flowing bodies of water and upland water edges and nearby wet meadows.
Bullfrog	*Rana catesbeiana*	X	Non-native. Quiet streams and ditches, pools, ponds, marshes and reservoirs.
Northern Leopard Frog	*Rana pipiens*		Wet meadows, streams and ditches, ponds, marshes, and reservoirs.
Plains Spadefoot	*Spea bombifrons*		Sandhills and plains grassland.
Reptiles			
Spiny Softshell	*Apalone spinifera*		Lowland riparian on rivers, streams, and intermittent creeks with permanent pools.
Snapping Turtle	*Chelydra serpentina*		Lowland riparian on streams, creeks with temporary pools, lakes, ponds, and reservoirs.
Painted Turtle	*Chrysemys picta*		Lowland ponds, marshes, river backwaters, and slow moving stretches of streams.
Six Lined Race Runner	*Cnemidophorus sexlineatus*	X	Prairie grassland, sand or gravelly banks and floodplains of streams.
Racer	*Coluber constrictor*		Grassland, open foothill and lowland riparian woodlands, shrubby foothills and canyons.
Western Rattlesnake	*Crotalus viridis*		Habitat generalist.
Many-lined Skink	*Eumeces multivirgatus*		Lowland habitats with loose sandy soil and prairie dog towns.
Western Hognose Snake	*Heterodon nasicus*		Sandhills, plains grassland, and sandy floodplains near streams, ditches, or ponds.
Lesser Earless Lizard	*Holbrookia maculata*		Sandhills, sandy or gravelly areas along streams, grassland with expanses of bare ground.
Milk Snake	*Lampropeltis triangulum*		Dryland habitat generalist generally below 8,000 ft.
Smooth Green Snake	*Liochlorophis vernalis*		Mountain and foothill riparian.
Northern Water Snake	*Nerodia sipedon*		Lowland riparian along major drainage systems.
Short-horned Lizard	*Phrynosoma hernandesi*		Dry upland, foothill, and lowland habitat generalist.
Gopher Snake	*Pituophis catenifer*		Upland, foothill, and lowland habitat generalist below 8,500 ft.
Fence Lizard	*Sceloporus undulatus*	X	Sunny, rocky habitats below 7,500 ft.
Plains Black-headed Snake	*Tantilla nigriceps*		Sandhills, plains grassland, foothills, rocky canyons.
Ornate Box Turtle	*Terrapene ornata*		Non-native. Introduced to lowland riparian along the Front Range.
Western Terrestrial Garter Snake	*Thamnophis elegans*		Habitat generalist often in the vicinity of any flowing or non-flowing body of water.
Plains Garter Snake	*Thamnophis radix*	X	Plains and foothill riparian generalist.
Common Garter Snake	*Thamnophis sirtalis*		Marshes, ponds, and stream edges; seldom found away from water or at isolated ponds.
Lined Snake	*Tropidoclonion lineatum*		Riparian and damp plains and canyon bottom grasslands below 6,000 ft.

* Observed in the study area by Bear Canyon Consulting, LLC or Natural Resource Services, Inc. personnel.

Table 5-4 Identified Mammal Species

Common Name	Scientific Name	Confirmed*	Front Range/Denver Metro Habitat
Coyote	*Canis latrans*	X	Habitat generalist.
American Beaver	*Castor canadensis*	X	Variety of habitats adjacent to water.
American Elk	*Cervus elaphus*	X	Semi-open forests, forest edges, occasional visitor to plains grasslands.
Hispid Pocket Mouse	*Chaetodipus hispidus*		Shortgrass and midgrass prairie and dry riparian areas in eastern CO.
Least Shrew	*Cryptotis parva*		Lowland habitat generalist in South Platte and Republican drainages.
Virginia Opossum	*Didelphis virginiana*		Non-native. Riparian, especially bordering agricultural lands.
Ord's Kangaroo Rat	*Dipodomys ordii*		Dryland habitat generalist.
Big Brown Bat	*Eptesicus fuscus*		Habitat generalist below 10,000 ft.
Common Porcupine	*Erethizon dorsatum*		Upland woodlands and lowland riparian.
Mountain Lion	*Felis concolor*	X	Habitat generalist.
Feral Cat	*Felis domesticus*	X	Non-native. Adjacent to and in human dominated landscapes.
Plains Pocket Gopher	*Geomys bursarius*		Sandhills and plains grasslands.
Silver-haired Bat	*Lasionycteris noctivagans*		Forest edges and adjacent open areas below 9,500 ft.
Red Bat	*Lasiurus borealis*		Lowland riparian woodlands.
Hoary Bat	*Lasiurus cinereus*		Roosts in trees, feeds in open habitats or habitat mosaics below 10,000 ft.
Black-tailed Jackrabbit	*Lepus californicus*	X	Semi-desert shrublands and grasslands below 7,000 ft.
White-tailed Jackrabbit	*Lepus townsendii*	X	Open habitat generalist.
Bobcat	*Lynx rufus*		Habitat generalist.
Striped Skunk	*Mephitis mephitis*	X	Habitat generalist.
Long-tailed Vole	*Microtus longicaudus*		Habitat generalist in mountainous areas.
Prairie Vole	*Microtus ochrogaster*	X	Plains grasslands, foothill shrublands.
Meadow Vole	*Microtus pennsylvanicus*	X	Moist habitats.
House Mouse	*Mus musculus*	X	Non-native. Adjacent to and in human dominated landscapes.
Short-tailed Weasel	*Mustela erminea*		Habitat generalist.
Long-tailed Weasel	*Mustela frenata*		Habitat generalist.
Mink	*Mustela vison*	X	Riparian.
Western Small-footed Myotis	*Myotis ciliolabrum*		Habitat generalist where roost sites are available below 8,500 ft.
Little Brown Myotis	*Myotis lucifugus*		Wooded areas below 11,000 ft.
Mexican Woodrat	*Neotoma mexicana*		Semiarid foothills and canyons below 8,500 ft.
Mule Deer	*Odocoileus hemionus*	X	Habitat generalist.
White-tailed Deer	*Odocoileus virginianus*	X	Riparian woodlands and adjacent wooded agricultural lands in eastern plains.
Common Muskrat	*Ondatra zibethicus*	X	Permanent aquatic habitats.

Table 5-4 Identified Mammal Species (Continued)

Common Name	Scientific Name	Confirmed*	Front Range/Denver Metro Habitat
Northern Grasshopper Mouse	*Onychomys leucogaster*		Semiarid grasslands and open semidesert shrublands.
Olive-backed Pocket Mouse	*Perognathus fasciatus*		Mixed prairie and open ponderosa pine forest along the Front Range.
Plains Pocket Mouse	*Perognathus flavescens*		Plains grasslands.
Silky Pocket Mouse	*Perognathus flavus*		Shortgrass and midgrass prairie.
Deer Mouse	*Peromyscus maniculatus*	X	Habitat generalist.
Townsend's Big-eared Bat	*Plecotus townsendii*		Semi-desert shrublands, plains riparian woodlands near caves and outcrops.
Raccoon	*Procyon lotor*	X	Habitat generalist.
Norway Rat	*Rattus norvegicus*	X	Non-native. Adjacent to and in human dominated landscapes.
Western Harvest Mouse	*Reithrodontomys megalotis*		Plains habitat generalist.
Plains Harvest Mouse	*Reithrodontomys montanus*		Plains grasslands.
Fox Squirrel	*Sciurus niger*	X	Non-native. Deciduous woodlands near and in human dominated landscapes.
Masked Shrew	*Sorex cinereus*		Moist mountainous habitats below 11,000 ft and lush plains riparian.
Merriam's Shrew	*Sorex merriami*		Dryland habitat generalist below 9,600 ft.
Golden-mantled Ground Squirrel	*Spermophilus lateralis*		Upland habitat generalist below 12,500 ft.
Spotted Ground Squirrel	*Spermophilus spilosoma*		Plains grassland with low vegetative cover and deep sandy soils.
Thirteen-lined Ground Squirrel	*Spermophilus tridecemlineatus*		Shortgrass and midgrass prairie and mountain parklands.
Rock Squirrel	*Spermophilus variegatus*	X	Rocky habitats of foothills and valleys below 8,300 ft.
Western Spotted Skunk	*Spilogale gracilis*		Semi-desert shrublands, pinon-juniper woods, montane forest & shrublands.
Desert Cottontail	*Sylvilagus audubonii*	X	Grassland, riparian, semi-desert shrubland, woodland edges in foothills.
Eastern Cottontail	*Sylvilagus floridanus*	X	Riparian and agricultural areas on eastern plains and foothills below 6,500 ft.
Least Chipmunk	*Tamias minimus*		Upland habitat generalist.
American Badger	*Taxidea taxus*		Open habitats.
Northern Pocket Gopher	*Thomomys talpoides*	X	Habitat generalist, absent from much of eastern Colorado.
Gray Fox	*Urocyon cinereoargenteus*		Rough, broken semi-desert shrublands, riparian woodlands, and orchards.
Black Bear	*Ursus americanus*		Habitat generalist.
Swift Fox	*Vulpes velox*		Shortgrass and midgrass prairies.
Red Fox	*Vulpes vulpes*	X	Habitat generalist.

*Observed in the study area by Bear Canyon Consulting, LLC or Natural Resource Services, Inc. personnel.

6.0 RESULTS

The study area is part of a mosaic of properties managed by several entities to maintain and enhance wildlife habitat along the Clear Creek corridor and in the North and South Table Mountain areas (City of Wheat Ridge and ERO Resources Corporation 2002; Jefferson County Planning and Zoning Division 2004).

Downstream of the study area, the City of Wheat Ridge Parks and Recreation Department identifies the preservation of wetland and riparian areas as a habitat goal in the city's Open Space Management Plan (City of Wheat Ridge and ERO Resources Corporation 2002). The wildlife goal in the plan includes land stewardship that incorporates strategies to enhance habitat and minimize the land use impacts on wildlife in the Wheat Ridge Greenbelt along Clear Creek.

The Jefferson County Planning and Zoning Division defines riparian habitat as a "maximum wildlife quality area" in its Central Plains Community Plan (Jefferson County Planning and Zoning Division 2004). This plan specifies a development review policy that minimizes degradation of these areas, specifically by not blocking access to them or negatively impacting the habitat.

The plant communities within the study area provide forage and cover for a number of migratory and breeding birds including the yellow warbler (*Dendroica petechia*), whitebreasted nuthatch (*Sitta carolinensis*), northern shoveler (*Anas clypeata*), American kestrel (*Falco sparverius*), and screech owl (*Otus asio*). Birds represent the bulk of the vertebrate diversity within the study area. Representative small mammals which may be present in the area include the deer mouse (*Peromyscus maniculatus*), eastern cottontail rabbit (*Sylvilagus floridanus*), and prairie vole (*Microtus ochrogaster*). Larger mammals and meso-carnivores which may be commonly found in the area include white-tailed deer (*Odocoileus virginianus*), mule deer (*Odocoileus hemionus*), beaver (*Castor canadensis*), red foxes (*Vulpes vulpes*), coyotes (*Canis latrans*), and raccoons (*Procyon lotor*). Abundant sign of the above mentioned meso-carnovores, i.e., tracks and scats, and CNHP found all three species to be abundant immediately downstream in the Wheat Ridge Greenbelt (Anderson and Stevens 2000).

Of the habitat types identified in the study area, riparian habitat has perhaps the highest wildlife value, i.e. utilization by the largest number of individual wildlife species. The riparian corridor associated with Clear Creek, and its associated ditches, connects the upstream foothills habitat with the downstream Wheat Ridge Greenbelt. Because small reserves support small populations and small populations are more likely to go extinct due to genetic drift, inbreeding depression, or stochastic events, connectivity is crucial. Where dispersal is possible and frequent enough, extinction may be counteracted by immigration (Van Vuren 1998). In landscapes fragmented by roadways, connectivity and dispersal may be maintained and encouraged where the barrier effect is mitigated by frequent placement of overpasses, underpasses, bridges, and culverts of wildlife-friendly design.

6.1 Potential Wildlife Species

Given the habitats present, the study area *may* be used at some stage in their life history by approximately 331 species of fish and wildlife. This number includes 17 species of fish, 7 species of amphibians, 21 species of reptiles, 221 avian species, and 59 species of mammals (see **Tables 5-1 through 5-4**). Species observed during other studies (Anderson and Stevens 2000, Beane 1998, Savage and Savage, Inc. 2004, Savage and Savage 2004) in the area are included in the tables.

Avian species represent the bulk of the vertebrate diversity identified in the study area. Fifty-one species were actually observed during the fieldwork for this project. Some species which had been observed in the field during other studies (Anderson and Stevens 2000; City of Wheat Ridge and ERO Resources Corporation 2002; MDG & Associates 1995) were not observed during this study, however. This should not infer a change in species composition.

6.2 Observed Wildlife Species

During field work, 69 vertebrate wildlife species were either sighted or detected in the study area including two fish species, the fathead minnow (*Pimephales promelas*) and the white sucker (*Catostomus commersoni*); two amphibian species, the bullfrog (*Rana catesbiana*) and Woodhouse's toad (*Bufo woodhousii*); and two reptile species, the fence lizard (*Sceloperus undulates*) and the plains garter snake (*Thamnophis radix*).

Fifty-one species of birds were field identified including the American coot (*Fulicaa americana*), American crow (*Corvus brachyrhynchos*), American goldfinch (*Carduelis tristas*), American kestrel, American robin (*Turdis migratorius*), American wigeon (*Anas americana*), barn swallow (*Hirundo rustica*), belted kingfisher (*Ceryle alcyon*), black billed magpie (*Pica pica*), black-capped chicadee *(Poecile atricapillus),* black crowned night heron (*Nycticorax nycticorax*), blue jay (*Cyanocitta cristata*), Brewer's blackbird (*Euphagus cyanocephalus*), Bullock's oriole (*Icterus bullockii*) (nest), Canada goose (*Branta canadensis*), chipping sparrow (*Spizella passerina*), cliff swallow (*Petrochelidon pyrrhonota*), common grackle (*Quiscalus quiscula*), common merganser (*Mergus merganser*), common yellowthroat (*Geothlypis trichas*) (song), dark-eyed junco (*Junco hyemalis*), double crested cormorant (*Phalacrocorax auritus*), European starling (*Sturnis vulgaris*), ferruginous hawk (*Buteo regalis*), gadwall (*Anas strepera*), great blue heron (*Ardea herodias*), hairy woodpecker (*Picoides villosus*), house finch (*Carpodacus mexicanus*), house sparrow (*Passer domesicus*), killdeer (*Charadrius vociferous*), lesser goldfinch (*Carduelis psaltria*), mallard (*Anas platyrhinchos*), merlin (*Falco columbarius*), mourning dove (*Zenaida macrouva*), northern flicker (*Colaptes auratus*), northern pintail (*Anas acuta*), northern shoveler, osprey (*Pandion haliaetus*), pied-billed grebe (*Podilymbus podiceps*), red tailed hawk (*Buteo jamaicensis*), red-winged blackbird (*Agelaius phoeniceus*) (song), rock dove (*Columba livia*), ruby-crowned kinglet (*Regulus calendula*), ruddy duck (*Oxyura jamaicensis*), snowy egret (*Egretta thula*), song sparrow (*Melospiza melodia*) (song), Wilson's warbler (*Wilsonia pusilla*), yellow warbler, yellow-headed blackbird (*Xanthocephalus xanthocephalus*), and yellow-rumped warbler (*Dendroica coronata*).

Sixteen mammal species were identified in the field including the beaver (active chewing and dam), common muskrat (*Ondatra zibethicus*) (track), coyote, eastern cottontail, desert cottontail (*Sylvilagus audubonii*), fox squirrel (*Sciurus niger*), mink (*Mustela vison*) (scat and track),

norway rat (*Rattus norvegicus*) (nest), raccoon, red fox (scat and track), rock squirrel (*Spermophilus variegates*), mule deer, white-tailed deer, meadow vole (*Microtus pennsylvanicus*) (runways), prairie vole (*Microtus ochrogaster*) (runways), white-tailed jackrabbit (*Lepus townsendii*), and black-tailed jackrabbit (*Lepus californicus*).

6.3 Wildlife Habitats

The study area provides habitat for a variety of wildlife species. It is probably most important as a movement corridor but also provides nesting habitat for birds, roosting habitat for birds and bats, loafing and feeding habitat for a wide variety of waterfowl, and resting and foraging habitat for a variety of small mammals, meso-carnivores, and deer.

6.3.1 Stream Habitat

Clear Creek is fed by cold water from high elevation lakes and streams. It provides habitat for 17 fish species including populations of brown trout (*Salmo trutta*), rainbow trout (*Salmo gairdneri*), and the Iowa darter (*Etheostoma exile*), a state listed sensitive species (Colorado Division of Wildlife 2005). However, because Clear Creek serves as a conduit for surface water flows and stormwater drainage, overall water quality has been reduced from its natural condition.

CDOW has conducted fish sampling of Clear Creek since 1980. A fish sampling of Clear Creek downstream of the study area at Broadway, in the early 1990's, found 15 species of fish, tremendous variety for such a small creek (Tom Nesler, CDOW, pers. comm. 2005). Nesler reported that there are more introduced game fish species than native fish species in Clear Creek. Bass and yellow perch (*Perca flavescens,* a warm water sport fish) escape from nearby ponds into the creek, competing with native green sunfish (*Lepomis cyanellus*) and orange spotted sunfish (*Lepomis humilis*). The Iowa darter (*Etheostoma exile*), a species considered at risk by the State, is also found in Clear Creek (Winkle 2005) (see Appendix A). Iowa darter populations or specimens are also known from Plum Creek and single locations on the Saint Vrain and Big Thompson River (Propst 1982), Cache la Poudre River, Lone Tree Creek, and Crow Creek (Li 1968) and Eleven Mile Reservoir in South Park.

Stream habitat along Clear Creek in the center of the study area

6.3.2 Wetland and Riparian Habitat

Wetland and riparian areas occur throughout the study area and include cattail/emergent marshes, willow-dominated shrublands, and cottonwood-dominated assemblages. MDG and Associates (1995) detected the northern leopard frog (*Rana pipiens*) in the Wheat Ridge Greenbelt but it hasn't been found since (Anderson and Stevens 2002; City of Wheat Ridge and ERO Resources Corporation. 2002). The only amphibians observed in the study area during this study were bullfrogs and the Woodhouse's toad. Hammerson (1999) notes that bullfrogs have apparently displaced northern leopard frogs in many locations in Colorado and elsewhere, presumably because bullfrogs are aggressive and more tolerant of elevated levels of water pollution.

Wetland habitat along the SH 58 stormwater drainage ditch

6.3.3 Ditches

Clear Creek, Juchem Ditch, Bayou Ditch, and the unnamed ditch paralleling the south side of SH 58 have stretches of well-developed riparian vegetation that support breeding habitat for resident and migratory birds (particularly neotropical migrants), important habitat for mammals (including bats), and habitat for reptiles and amphibians. Mature cottonwood trees and snags present in these areas provide roosting habitat for raptors, feeding and nesting habitat for woodpeckers, and passerines, and roosting habitat for bats. The riparian habitat functions as a movement corridor between the foothills and higher elevation habitats, and the plains. A variety of wildlife species, including black bears (Urdus americana), cougars (Felis concolor), coyotes, white-tailed deer, and mule deer have all been documented moving along Clear Creek.

Riparian Habitat along Bayou Ditch

6.3.4 Beaver Ponds

Beavers were seen and evidence of their activity was observed by the researchers during the field surveys to include dams, a lodge, drags, scent piles, and chewings on woody vegetation. Beavers require streamside habitats and will also use wetlands and lakes. They can be among the most beneficial of wildlife as they create favorable habitat for a variety of wildlife species including fish, birds, amphibians, reptiles, and mammals. Beaver modification of habitat may be helpful in retaining storm water runoff and improving water quality by trapping sediment, nutrients, and pollutants. In the study area, beaver activity was found in the wetlands in the northeast corner, in the riparian areas along Clear Creek, and in the Coors Brewing Company water storage ponds.

Beaver dam in the northeast corner of the study area.

Beaver chewings observed during field work in the northeast corner of the study area.

6.3.5 Open Water Lakes and Ponds

The Coors water storage ponds provide loafing and feeding habitat for a variety of waterfowl, gull, wading bird, and shorebird species as well as feeding habitat for bats and insect eating bird species such as swallows and swifts. The ponds are likely to be especially important during migration. Bald eagles (*Haliaeetus leucocephalus*), a federally threatened species; osprey; and belted kingfishers have been observed fishing in the ponds.

Open Water Habitat

6.3.6 Uplands

Upland habitats within the study area include open grass and forb dominated vegetative communities, shrub dominated communities and forested areas. Grass-forb communities are characterized by a high percentage of exotic and weedy species. Shrub communities are dominated by coyote willow (*Salix exigua*) along the ditches and the Clear Creek channel and by rabbitbrush on the more xeric uplands. Forested areas are made up almost exclusively of hardwood species predominated by cottonwoods (*Populus* spp.), crack willow (*Salix fragilis*), boxelder (*Acer negundo*), and green ash (*Fraxinus pennsylvanica*).

While not as productive as riparian areas, the upland areas provide habitats for a variety of rodent, rabbit, ungulate, and predatory mammals as well as well as a large number of seed and insect eating bird species. Raptors and owls also utilize these sites as hunting areas for capturing rodents and small birds as well as for roosting and nesting sites in the forested areas. No raptor nests were observed during the field surveys in September 2005, however.

Grass-forb habitat at the west end of the study area.

Shrub habitat along the uplands adjacent to Clear Creek.

Hardwood forest along the Bayou Ditch just north of Clear Creek.

6.3.7 Peripheries of the Study Area – Residential/Commercial and Road ROW

Highway rights-of-way (ROW) and residential-commercial development surround the study area on all sides. The Coors brewery industrial area lies immediately to the west. Additional industrial areas lie immediately to the north of SH 58. Interstate 70 and Youngsfield Street with associated commercial and residential development parallel the east side of the study area. The south side of the study area is bounded by 32nd Avenue and its associated residential areas as well as the Applewood Golf Course.

6.3.7.1 SH 58

SH 58 is an east-west four-lane freeway that terminates at I-70 and extends west approximately six miles to Golden. The ROW on the north side of SH 58 includes a drainage ditch that supports mature riparian woodland vegetation. This thin strip may provide habitat for passerine birds, but is probably not used by many other species.

6.3.7.2 32nd Avenue

32nd Avenue is a two-lane minor arterial that runs east-west on the south boundary of the study area. The road is bordered by residential areas, Applewood Golf Course, and a school. This area provides minimal wildlife habitat, primarily residential landscaping that may be used by passerine bird species.

6.3.7.3 Youngfield Street/I-70 Corridor

Youngfield Street is a two-lane street located immediately east of I-70 on the eastern edge of the study area. It functions as a frontage road to I-70 and is fronted with residential-commercial buildings on the east side. South of 32nd Avenue, it extends into a residential-commercial neighborhood. The ROW along this corridor on the west side of I-70 is a strip of grassland dominated by non-native species. It does not connect Clear Creek to any other habitat to the south. It may provide foraging habitat for a few grassland bird and rodent species and hunting areas for raptors.

6.3.7.4 McIntyre Street

McIntyre Street interchanges with SH 58 and runs south along the western edge of the study area to 32nd Avenue. There is a thin ROW dominated by grasses and rubber rabbitbrush (*Chrysothamnus nauseous*) that connects the Clear Creek riparian corridor and the reclaimed grasslands immediately north of the Coors water storage ponds to the natural sparsely forested grassland habitat at the southwest corner of the study area. There are significant Jefferson County Conservation Easements on the South Table Mountain and adjacent open space sites (Jefferson County Planning and Zoning Division 2004). The remainder of South Table Mountain is proposed Open Space (Jefferson County Planning and Zoning Division 2004). The ROW along McIntyre Street is very likely used as a movement corridor by meso-carnivores as well as by ungulates moving between the Clear Creek riparian corridor and the natural habitats immediately southwest of the Study Area.

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7.0 CONSEQUENCES OF CONSTRUCTION AND MITIGATION

The local agency projects which include the extension of Cabela Drive from approximately 40th Avenue to just north of Clear Creek will bridge the creek and may be expected to impact wetlands and wildlife habitat connectivity along Clear Creek. The Proposed Action does not include a crossing of Clear Creek, however. Disturbance of riparian habitats in the study area is possible along Clear Creek, Juchem Ditch, and Bayou Ditch. **Table 8-1** summarizes anticipated impacts to wildlife habitat and populations that may result from construction of the Proposed Action and the proposed local agency projects.

The impacts of road construction near streams, riparian areas, and floodplains that serve as critical habitat and travel corridors for wildlife are well documented (Forman and Alexander 1998). Roads contribute to vehicle-caused mortality and reduced habitat connectivity. Connectivity and dispersal in riparian landscapes may be maintained and encouraged where the barrier effect is mitigated by placement of suitable culverts and bridges. While it is impractical to design mitigation projects that account for the specific requirements of all species affected by a roadway project, it may be possible to develop a generalized strategy for making them more permeable to wildlife passage for a larger number of species (Forman and Alexander 1998).

Bridges that span entire riparian areas at floodplain width instead of just the active stream channel width allow larger wildlife species such as deer to pass safely beneath roads (Adair et al. 2002). High bridges are the most effective type of wildlife crossing structure, especially if they provide unsubmerged areas along the stream (Veenbaas and Brandjes, 1999). Higher bridges also allow less shading beneath them and are, therefore, more conducive to herbaceous growth within their footprint.

Where culverts are used to cross ditches and streams, oversized culverts, large enough to allow for wildlife passage, may be used. Box culverts generally provide more room for travel than do large concrete or metal pipes. Bottomless culverts – typically arch culverts with no bottom section – at channel crossings simulate natural stream conditions and encourage aquatic organisms and fish passage (Adair et al. 2002). Efforts to provide natural substrate, including large rocks, as cover for small animals, will enhance their use by some species. Construction of benches on one or both sides of the stream to allow dry passage during normal high water periods will also enhance these structures (Beier 1995). The optimum size for these structures is not known, but generally, the larger the better. Culverts are less expensive than expanded bridges, but are also less effective (Beier 1995).

The open spaces surrounding the Coors water storage ponds provide feeding habitat for ungulates and may also serve as a movement corridor for ungulates and meso-carnivores between Clear Creek and Denver Mountain Park, South Table Mountain Park, and adjacent undeveloped land south of Rolling Hills Country Club immediately south of the study area. While much of this area is infested with exotic plant species and is, therefore, marginal as wildlife habitat, these areas could be improved significantly for wildlife by the reestablishment of native plant communities.

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8.0 SUMMARY

Table 8-1 Wildlife Resources Summary Matrix

Screening Measure	Existing Conditions	Local Agency Projects 1. Youngfield St. Improvements 38th to 44th Avenue 2. 40th Avenue Underpass 3. Cabela Drive from 40th Avenue to north of clear creek	Proposed Action 1. SH 58/Cabela Drive Interchange Improvements 2. I-70/32nd Avenue Hook Ramps
Wildlife Habitat Diversity	Ranges from large open water areas to riparian emergent and forested wetlands to dry forested and open uplands.	1. No change. 2. Decrease in diversity. 3. Decrease in diversity.	1. Decrease in diversity. 2. No change.
Wildlife Habitat Quality	Generally poor quality habitat over most of the site.	1. No change. 2. No change. 3. Decrease in quality.	1. Decrease in quality. 2. No change.
Wildlife Habitat Connectivity (Movement Corridors)	Poor over most of the site.	1. No change. 2. Decrease in connectivity. 3. Decrease in connectivity.	1. Decrease in connectivity. 2. No change.
Wildlife Species Diversity	Moderate.	1. No change. 2. No change. 3. Decrease in diversity.	1. Decrease in diversity. 2. No change.

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APPENDIX A CDOW Fisheries Management Email Regarding Clear Creek Fish Species

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From: Paul.Winkle@state.co.us
Date: November 3, 2005 3:34:42 PM MST
To: aruggles@igc.org
Subject: RE: species list

Anne,
After looking through the files of previous sampling, here is a list (not necessarily all-inclusive) of fish species that are likely to occur in that portion of Clear Creek. Some species will occur at greater abundances than others.

Brown trout
Common carp
Longnose dace
White sucker
Longnose sucker
Smallmouth bass
Bluegill
Creek chub
Rainbow trout
Fathead minnow
Sand shiner
Iowa darter
Green sunfish
Largemouth bass
Pumpkinseed

As far as the Coors pond associated with their mitigation wetlands just southeast of the intersection of McIntyre and Route 58, we have planted northern redbelly dace and common shiner. Those should be the only two fish species present in that pond.

-----Original Message-----
From: anne ruggles [mailto:aruggles@igc.org]
Sent: Tuesday, November 01, 2005 2:53 PM
To: Winkle, Paul
Subject: species list

Hello;
I wrote to you in September asking about the presence of Iowa Darters and round-tailed chubs (listed as a potential species in a CNHP document) in Clear Creek in the Golden-Wheatridge area. You answered those questions.

Is there a list of species that are likely to occur in Clear Creek (E of hwy 93 and W of Denver)? I'm also interested in species that may have been planted in the ponds at Coors.
many thanks,
Anne

_____
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