

Vegetation and Wildlife Impacts

I-25 Improvements Project Technical Memorandum

CDOT Project No. IM 0252-316

Project Control No. 12210

Colorado Department of Transportation

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1.0 Project Description (Proposed Action)

The Proposed Action would widen Interstate 25 (I-25) from South Academy Boulevard (Exit 135) to State Highway 105 (Exit 161, Monument), a distance of approximately 26 miles. Within these limits, a six-lane cross-section (three through-lanes in each direction) would be built south of the U.S. Highway 24 Bypass to South Academy and north of Briargate to SH 105. Additionally, for the 12-mile central portion from the US 24 Bypass (Exit 139) to Briargate Parkway (Exit 151), the Proposed Action consists of an eight-lane cross section (four through-lanes in each direction).

In the eight-lane cross-section, the inside (left-most) lane in each direction would be open to general traffic during off-peak hours; during morning and evening peak hours, this lane would be reserved for use by carpools and buses only. To accommodate this flexible use, the high-occupancy-vehicle (HOV) lane would not be barrier-separated from the general-purpose lanes, but would be demarcated by appropriate signage and striping.

The non-barrier HOV treatment also allows for decommissioning of the lanes back to general-purpose operation in the event that the lanes do not result in adequate peak-period usage to justify HOV operations. This will depend in part upon public willingness to fund expanded transit operations that would use the HOV lanes. The HOV lanes are projected to be marginally successful without transit system expansion, but could become solidly successful if used by buses on hypothetical future routes (currently unfunded). Express bus service between Colorado Springs and Monument began in 2002 as a 3-year “demonstration project.”

In conjunction with the additional laneage, the Proposed Action includes interchange reconstruction at several locations. These include major reconstruction of existing interchanges at:

- Exit 141 - Cimarron (U.S. Highway 24)
- Exit 142 - Bijou Street
- Exit 145 - Fillmore
- Exit 147/148 - North Nevada Avenue and Rockrimmon Boulevard (consolidated)
- Exit 156 – North Gate Road, plus freeway-to-freeway ramps for Powers Boulevard
- Exit 158 – Baptist Road

For each of the interchange reconstruction projects, numerous design alternatives were considered and evaluated. These alternatives were presented for review and input at advertised public meetings.

Additionally, minor geometric changes will be made at Exit 146, Garden of the Gods Road. The existing southbound-only ramps at Exit 147 A (Corporate Centre Drive) will be closed, with access via a local street connection to the reconfigured Nevada/Rockrimmon interchange. In conjunction with freeway widening on U.S. Air Force Academy property, the Ackermann Overlook will be relocated to a safer location.

The I-25 corridor already has traffic surveillance cameras, variable message signs, and an incident management system. In the Proposed Action, the design of freeway on-ramps will accommodate future implementation of ramp metering.

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2.0 Existing Conditions

2.1 General Landscape

The project study area is located at the foothills of the Rocky Mountains in south central Colorado. Elevation ranges from 6,685 feet above mean sea level (MSL) in the north near the State Highway 105 interchange to 5,700 feet (MSL) in the south at the State Highway 16 interchange. The project area lies along the convergence of the Central Shortgrass Prairie and Southern Rocky Mountain ecoregions. The Central Shortgrass Prairie ecoregion is characterized by rolling plains and tablelands dissected by streams, canyons, badlands and buttes, and dominated by shortgrass, mixed-grass, and sandsage prairie (Colorado Natural Heritage Program [CNHP], 2002). The Southern Rocky Mountain ecoregion includes two major mountain systems extending from southern Wyoming to northern New Mexico, including major ecological zones ranging from high alpine to foothills.

The study area lies primarily within the Arkansas River Drainage basin, south of the Palmer Divide. Tributaries within the Arkansas River watershed in close proximity of the study area include Monument Creek, Cottonwood Creek, Pine Creek, Kettle Creek, Black Squirrel Creek, Monument Branch Creek, Smith Creek, Jackson Creek, Teachout Creek, Dirty Woman Creek, and numerous small unnamed draws and drainages.

The study area is highly affected by urban development. The historic construction of I-25 has drastically altered the original natural landscape and features. Previous construction has created a disturbed corridor allowing the establishment of exotic plant species, fragmented habitat, and created a west-to-east (and east-to-west) obstacle for wildlife movement. The northern one-third of the study area (i.e. north of North Academy Boulevard, Exit 150) is relatively less disturbed, while the study area from North Academy Boulevard to South Academy is highly influenced from the dense urban development of the City of Colorado Springs. South of South Academy Boulevard (Exit 135), the study area begins again to be less affected by urban pressures.

2.2 Historic Condition

The historic condition of the study area has been drastically altered in the past century. Prior to the early 1900's, the area was inhabited by a wide variety of species; bison, antelope and prairie dogs were found in the grassland communities, while bear, deer and bighorn sheep were common in the more mountainous regions (CNHP, 2002). By the early 1900s, land use changes and population growth in the region was having a noticeable effect on habitats and species composition. Urban development, flood control, fire suppression, logging, mining, agricultural practices, irrigation needs, and domestic grazing began to alter the natural ecological processes and local environment. Today these effects are quite evident with the loss or threat of loss of species (i.e., bison, Preble's mouse, Arkansas darter) and habitats,

increase of non-native invasive species (i.e., Russian olive, tamarisk, thistle), and degraded riparian corridors. Areas of disturbance associated with the original construction of I-25 within the right-of-way are highly disturbed, having less native vegetation and minimal biodiversity.

2.3 Vegetation Communities

Vegetation communities in the study area include forests, shrublands, grasslands, and wetlands. This analysis of vegetation communities will consider only upland areas not classified as jurisdictional waters of the U.S. or wetlands. Vegetation communities associated with the wetland habitat are discussed in greater detail in the Wetlands Technical Memorandum.

A description of the existing upland vegetative communities identified in the project area is presented below.

2.3.1 Forest Communities

Forest communities within the study area can be grouped into two primary categories: Ponderosa Pine communities and Riparian Deciduous Tree communities. However, isolated mature trees can also be found in the study area.

Ponderosa Pine Communities

Ponderosa Pine communities are commonly found in the northern and southern sections of the study area along the foothills west of I-25. These communities can be characterized by an overstory dominated by ponderosa pine (*Pinus ponderosa*) and an understory typically dominated by upland grass species including smooth brome (*Bromus inermis*), little bluestem (*Schizachyrium scorparium*), and big bluestem (*Andropogon gerardii*) intermixed with small shrubs of wild rose (*Rosa woodsii*) and snowberry (*Symphoricarpos albus*).

Riparian Deciduous Tree Communities

Riparian deciduous tree communities are commonly located along drainages and creeks through the study area. These communities are typically located on the outer limits of wetlands, and may not have met the criteria of jurisdictional wetlands. The community category is typically dominated by an overstory of plains cottonwood (*Populus deltoides*) and peachleaf willow (*Salix amygdaloides*) intermixed with a wide variety of non-native, introduced species including crack willow (*Salix fragilis*) and Siberian elm (*Ulmus pumila*). The understory often includes patches of shrubs and grass including sandbar willow (*Salix exigua*), snowberry, wild rose, smooth brome, alfalfa (*Medicago sativa*), yellow sweet clover (*Melilotus officinalis*), and orchard grass (*Dactylis glomerata*).

Isolated Mature Trees

Many single, isolated trees are located through the project area. These trees are typically remnants from previously fragmented forest communities or are non-native volunteer species that have become established. Larger isolated mature trees species identified include plains cottonwoods, crack willows, and Siberian elm. Some of the trees have become quite large, up to 75+ feet in height, and serve as very localized habitats for birds and other wildlife.

2.3.2 Shrubland Communities

Shrubland communities are commonly located on hillsides throughout the study area. These areas are characterized by a midstory dominated by gamble oak (*Quercus gambelii*) intermixed with skunkbrush (*Rhus aromatica*), mountain mahogany (*Cercocarpus montanus*), woods rose, and yucca (*Yucca glauca*). Typically, upland grasses are interspersed throughout the understory and include wheatgrasses (*Pascopyrum spp.*), blue grasses (*Poa spp.*), and other shortgrass prairie species mentioned in the next section.

2.3.3 Grassland Communities

Grassland communities occupy a majority of the study area. These communities can be grouped into two primary categories: Shortgrass Prairie Grassland and Disturbed Roadside Grassland. Among these communities exist a number of noxious weeds.

Shortgrass Prairie Grassland Communities

Shortgrass Prairie Grassland communities are more commonly found in the northern sections of the study area, outside of the mainline right-of-way of I-25. These areas are characterized by shorter growing grasses including buffalograss (*Buchloe dactyloides*), blue grama (*Chondrosium gracile*), and little bluestem (*Schizachyrium scoparium*) interspersed with yucca (*Yucca glauca*) and prickly pear (*Opuntia polyacantha*). Although this type of community has been classified as “prairie,” these areas are not historic relic prairies, but are the disturbed remnants of once shortgrass prairies that have been highly influenced by past land use practices such as agriculture, irrigation, grazing, and development.

Disturbed Roadside Grasslands

The prevalent grasslands within the study area include disturbed areas from previous earth disturbance that have been revegetated. This community type is found along the roadsides and slopes and consists of non-native grasses and weed species including smooth brome, Japanese brome (*Bromus japonicus*), crested wheatgrass (*Pascopyrum cristatum*), yellow sweet clover, thistles (*Cirsium spp.*), and knapweed (*Centaurea spp.*). These areas are often highly disturbed and routinely affected by maintenance operations (i.e., mowing, spraying, and snow plowing).

Noxious Weeds

Noxious weed is a legally defined term by the State of Colorado that refers to specific plant species that have been designated for mandatory control by branches of local, state, or federal government due to the harm, actual or potential, that the species is capable of inflicting upon the resources and values of society (State of Colorado, Dec. 2001). Noxious

weeds commonly establish in recently disturbed areas, out-competing native species. The following species that are on the State noxious weed list have been identified within the project area; many of these are listed as one of the top ten prioritized weed species:

- Canada Thistle (*Cirsium avervense*)
- Diffuse Knapweed (*Centaurea diffusa*)
- Russian Knapweed (*Acroptilon repens*)
- Musk Thistle (*Carfuus nutans*)
- Common Burdock (*Arctium minus*)
- Field Bindweed (*Convolvus arvensis*)
- Kochia (*Kochia scoparia*)
- Yellow Toadflax (*Linaria vulgaris*)
- Chicory (*Chichorium intybus*)
- Common Mullein (*Verbascum thapsus*)
- Common Teasel (*Dipsacus fullonum*)
- Poison Hemlock (*Conium maculatum*)
- Saltcedar (*Tamarix spp.*)

Diffuse knapweed, Canada thistle, and musk thistle are currently the most widespread weed species present within the study area and throughout El Paso County. These weeds are primarily located along the shoulder of the existing I-25 pavement and present in moderate densities dispersed throughout the entire length of the study area.

2.4 Wildlife

The wildlife species to be considered in this study that may inhabit or potentially utilize the land within the vicinity of the study area are vast. On the U.S. Air Force Academy property alone (located toward the northern limits of the study area), close to 70 species of mammals have been identified (CNHP, 2002). In addition to mammals, migratory birds, waterfowl, songbirds, reptiles, insects, amphibians, fish, and other aquatic organisms were also considered in this study. A screening was conducted of Federal- and State-listed threatened and endangered species of concern that could potentially exist within the range of the study area. Consideration also was given to wildlife species that are known to exist in the general vicinity of the study area that may be affected by the project. All lands, vegetation communities, and habitats, including wetlands, within the study area were considered during assessment of wildlife issues.

Wildlife can utilize the general landscape in a multitude of ways. Wildlife can use specific habitats as areas of permanent inhabitation, seasonal inhabitation, migratory routes or as a temporary shelter, or for foraging. Many of the species discussed in the following sections do not inhabit the specific project study area, but may utilize areas immediately adjacent. Due to the vast number of species and the dynamic, continuously moving nature of wildlife that are not confined to a single habitat type, generalized categorizes of species and habitat types are provided.

2.4.1 Birds

A wide array of bird species is common to all habitat types found in the study area. Both migratory and resident bird species inhabit or utilize riparian drainages, wetlands, shrublands, grasslands, and weedy ditches within the study area. Riparian areas dominated by cottonwoods and willow tend to be the most utilized. Bird species expected within all habitat types of the study area include Audubon's yellow rumped warbler (*Dendroica coronata*), Wilson's warbler (*Wilsonia pusilla*), MacGillivray's warbler (*Oporornis tolmiei*), western tanager (*Piranga ludoviciana*), golden-crowned kinglet (*Regulus satrapa*), ruby-crowned kinglet (*Regulus calendula*), white-crowned sparrow (*Zonotrichia leucophrys*), cliff swallows (*Petrochelidon pyrrhonata*), great blue herons (*Ardea herodias*), snowy egret (*Egretta thula*), Canada goose (*Branta canadensis*), wood duck (*Aix sponsa*), teals, mallards, pintails, shovlers, and gadwalls (*Anas spp.*), mergansers (*Mergagus spp.*), Mississippi kite (*Ictinia mississippiensis*), northern harrier (*Circus cyaneus*), Cooper's hawk (*Accipiter cooperii*), red-tailed hawk (*Buteo jamaicensis*), and numerous species in the families of swifts (*Apodidae*), flycatchers (*Tyrannidae*), swallows (*Hirundinidae*), jays, magpies and crows (*Corvidae*), wrens (*Troglodytidae*), finches (*Fringilline*), and sparrows (*Emberizidae*).

2.4.2 Mammals

Many species of mammals inhabit the general vicinity of the study area, utilizing all habitat types present. Larger mammal species include elk (*Cervus elaphus*), mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), black bear (*Ursus americanus*), and mountain lion (*Felis concolor*). Many of these species may graze the open prairie land, utilize wetlands, and use riparian areas as movement corridors or for shelter. Other smaller mammals common in the region and the study area, which occupy the same habitat types, may include coyote (*Canis latrans*), red fox (*Vulpes*), bobcat (*Lynx rufus*), raccoon (*Procyon lotor*), skunk (*Mephitis spp.*), prairie dogs (*Cynomys spp.*), rabbits (*Sylvilagus spp.*), squirrels (*Sciurus spp.*), mice (*Peromyscus spp.*), and voles (*Microtus spp.*). Despite a widely publicized visit to central Colorado Springs in 2001 by a stray animal, moose (*Alces alces*) does not inhabit the general vicinity of the study area.

2.4.3 Amphibians

Amphibians are a broad classification of organism that utilize and are dependent on both shallow aquatic and terrestrial environments during their life cycle. The larval stage of most amphibians is spent exclusively in shallow water, eventually undergoing metamorphosis at which time adaptations for survival on land occurs. Amphibians of the eastern plains of Colorado are closely associated with wetlands, wet meadows, the shallows of ponds, lakes and reservoirs, and seasonal riparian areas. Amphibians known to exist in these types of habitats in the plains of El Paso County include the tiger salamander (*Ambystoma tigrinum*), plains spadefoot toad (*Scaphiopus bombifrons*), Great Plains toad (*Bufo cognatus*), Woodhouse's toad (*Bufo woodhousii*), western chorus frog (*Pseudacris triseriata*), plains leopard frog (*Rana blairi*), bullfrog (*Rana catesbeiana*), and northern leopard frog (*Rana pipiens*).

2.4.4 Reptiles

Reptiles are a broad classifications of organisms that are ectothermic (deriving their body heat from external sources) and that live in a wide variety of environments ranging from permanent ponds and pools to the dry sandy or rocky plains. Reptiles of the eastern plains of Colorado, including El Paso County, that can be found in all common habitats of the area include snapping turtles (*Chelydra serpentina*), painted turtles, ornate box turtle (*Terrapena ornata*), lesser earless lizard (*Holbrookia maculata*), short-horned lizard (*Phrynosoma hernandesi*), prairie lizards (*Sceloporus undulatus*), six-lined racerunner (*Cnemidophorus sexlineatus*), many-lined skink (*Eumeces multivirgatus*), racer snake (*Coluber constrictor*), Great Plains rat snake (*Elaphe guttata*), western hognose snake (*Heterodon nasicus*), western terrestrial garter snake (*Thamnophis elegans*), and the western rattlesnake (*Crotalus viridis*).

2.5 Threatened, Endangered, and Species of Concern

A screening was conducted of species listed as threatened, endangered or of concern by the U.S. Fish and Wildlife Service (USFWS) under the Endangered Species Act (ESA) that may potentially occur in the general vicinity of the study area. Existing conditions of wildlife habitat and vegetative communities were documented through a combination of direct field surveys, aerial photo interpretation, review of existing literature and direct contact with leading experts. Species information was also obtained from the USFWS, Colorado Division of Wildlife (CDOW), Natural Diversity Information Source (NDIS) and the Colorado Natural Heritage Program (CNHP).

A review of the CNHP Biological and Conservation Datasystem (BCD) for natural heritage resources (occurrence of significant natural communities and rare, threatened or endangered plants and animals) was conducted for the study area. Review of the datasystem revealed a total of 30 rare or imperiled species and nine rare or imperiled natural communities that are known to exist in the general vicinity of the study area. Grouped taxonomically, six species of birds, one species of fish, four species of insects, five species of mammals, nine natural communities, and fourteen rare and/or imperiled plant species were identified (CNHP, May 14, 2001). The complete list compiled by the CNHP for the project area is presented in Table 1.

TABLE 1
Colorado Natural Heritage Program Environmental Review
Status of Rare and/or Imperiled Species known from the I-25 Corridor Project Area in El Paso County, Colorado

Scientific Name	Common Name	Federal Listing Agency ¹	Status ²
BIRDS			
<i>Buteo regalis</i>	ferruginous hawk	FS/BLM	SC
<i>Charadrius montanus</i>	mountain plover	FS/BLM	SC
<i>Dendroica graciae</i>	Grace's warbler		
<i>Haliaeetus leucoccephalus</i>	bald eagle		FT, ST
<i>Seiurus aurocapillus</i>	Ovenbird		
FISH			
<i>Etheostoma cragini</i>	Arkansas darter	FS	ST

TABLE 1

Colorado Natural Heritage Program Environmental Review
 Status of Rare and/or Imperiled Species known from the I-25 Corridor Project Area in El Paso County, Colorado

Scientific Name	Common Name	Federal Listing Agency ¹	Status ²
INSECTS			
<i>Amblyscirtes simus</i>	Simius roadside skipper		
<i>Callophrys mossii schryveri</i>	Moss's elfin		
<i>Celastrina humulus</i>	Hops feeding azure		
<i>Hemileuca grotei Diana</i>	A buckmoth		
MAMMALS			
<i>Cynomys gunnisoni</i>	Gunnison's prairie dog		
<i>Cynomys ludovicianus</i>	Black-tailed prairie dog		SC
<i>Plecotus townsendii pallescens</i>	Townsend's big-eared bat	FS/BLM	
<i>Vulpes velox</i>	swift fox	FS	SC
<i>Zapus hudsonius preblei</i>	Preble's meadow jumping mouse	FS	FT, ST
NATURAL COMMUNITIES			
<i>Alnus incana.mesic graminoid</i>	mountain riparian shrubland		
<i>Alnus incana-cornus sericea</i>	thinleaf alder-red-osier dogwood riparian shrubland		
<i>Muhlenbergia torreyi</i>	shortgrass prairies		
<i>Pinus ponderosa/Quercus gambellii</i>	foothills ponderosa pine scrub woodlands		
<i>Populus angustifolia/Salix exigue</i>	narrowleaf-cottonwood riparian forests		
<i>Quercus gamellii/Carex inops</i>	mesic oak thickets		
<i>Salix exigua/mesic graminoid</i>	coyote willow/mesic graminoid		
<i>Stipa neomexicana</i>	Great Plains mixed grass prairies		
<i>Symphoricarpos occ.</i>	snowberry shrubland		
PLANTS			
<i>Ambrosia linearis</i>	plains ragweed	FS	
<i>Amorpha nana</i>	dwarf wild indigo		
<i>Aquilegia chrysantha var. rydbergii</i>	golden columbine	BLM	
<i>Cypripedium calceolus ssp parviflorum</i>	yellow lady's slipper		
<i>Eriogonum brandegeei</i>	brandegee wild buckwheat	FS/BLM	
<i>Hypoxis hirsute</i>	yellow stargrass		
<i>Juncus brachycephalus</i>	small-headed rush		
<i>Nama dichotomun</i>	livemore fiddleleaf		
<i>Nuttallia chrysantha</i>	golden blazing star	BLM	
<i>Potentilla ambigens</i>	southern rocky mountain cinquefoil		
<i>Ribes americanum</i>	American currant		
<i>Unamia alba</i>	prairie goldenrod		
<i>Viola pedatifada</i>	prairie violet		
<i>Woodsia neomexicana</i>	New Mexico cliff fern		

¹ FS = Forest Service, BLM = Bureau of Land Management

² SC = State Species of Concern, FE = Federal Endangered, SE = State Endangered, FT = Federal Threatened, ST = State Threatened

The USFWS has identified the following federally listed threatened, endangered and of concern species that could potentially occur in El Paso County (USFWS, 2001). Further analysis of species-specific habitat requirements was then compared to existing field conditions to determine the probability of occurrence within the study area.

2.5.1 Ute Ladies-tresses Orchid (*Spiranthes diluvialis*)

The Ute ladies-tresses orchid is listed as federally threatened under the ESA. The orchid occurs in seasonally moist soils and wet meadows near springs, lakes, or perennial streams and their associated floodplains below 6,500 feet elevation in certain areas in Utah, Colorado, Idaho, Wyoming, and Nevada. Typical sites include old stream channels and alluvial terraces, sub-irrigated meadow and other sites where the soil is saturated to within 18" of the surface at least temporarily during the spring or summer growing seasons. Surveys are required for appropriate sites below 6,500 feet elevation in the Fountain Creek 100-year floodplain and perennial tributaries from the Front Range to the southern boundary of El Paso County. Sites not requiring a survey included highly disturbed or modified sites such as highway rights-of-way, upland sites including prairie dog towns, shortgrass prairie and sagebrush rangeland, sites entirely inundated by standing water (including monocultures of cattails), or Olney's three-square. The habitat characteristics present within the study area limit the probability of this species being present. In addition, no populations are known to exist within the limits of the study area.

2.5.2 Colorado Butterfly Plant (*Gaura neomexicana* spp. *coloradensis*)

The Colorado butterfly plant is a short-lived, perennial herb endemic to moist soils in mesic or wet meadows of floodplain areas in southeastern Wyoming, north central Colorado, and extreme western Nebraska. This early to mid-seral stage species occurs primarily in habitats created and maintained by streams active within their floodplains, with vegetation that is relatively open and not overly dense or overgrown. The disturbance of riparian areas that contain native grasses by agricultural conversion, water diversions, channelization, and urban development threaten the species existence (Federal Register, 2000). These habitat characteristics are present within the study area, but the highly disturbed nature of the area limits the probability of the presence of this species. In addition, the species distribution does not extend south into El Paso County and no known population of the butterfly plant exists in El Paso County.

2.5.3 Bald Eagle (*Haliaeetus leucocephalus*)

The bald eagle is listed as federally threatened under the ESA. Bald eagles are usually winter residents of Colorado. These raptors are commonly found in lower elevation grasslands and semi-deserts near prairie dog towns and deciduous tree-dominated riparian corridors and reservoirs. Although no bald eagle nests or individuals were observed within or near the study area during the investigation, many of the mature riparian deciduous trees present along the riparian corridors may provide potential habitat for this species. The Proposed Action is not likely to adversely affect the continued existence of the species.

2.5.4 Black-footed Ferret (*Mustela nigripes*)

The black-footed ferret is listed as a federally endangered species under the ESA. The ferret is dependent on prairie dog colonies for food, shelter, and nursing. A prairie dog colony averaging 80 acres is required to support a viable population of ferrets. Three prairie dog colonies were observed within the study area (see Section 2.4.5). All of the existing colonies are smaller than 80 acres and, therefore, would not qualify as ferret habitat (USFWS, 1989). The Proposed Action is not likely to adversely affect the continued existence of the species.

2.5.5 Mexican Spotted Owl (*Strix occidentalis lucida*)

The Mexican spotted owl is listed as a threatened species under the ESA. Critical habitat is not identified by the USFWS within the limits of the study area. Habitat evaluated from the south half of the Air Force Academy extending south until Garden of the Gods Road contains plant species characteristic to Mexican spotted owl habitat (USFWS, 1995). The potential habitat within the I-25 study area lacks the dense canopy and complexity that Mexican spotted owls inhabit. In addition, the noise pollution caused by I-25 traffic deters regular Mexican spotted owl visits. The owls may travel across or rarely visit lands within the study area. The Proposed Action is not likely to adversely affect the continued existence of the species.

2.5.6 Arkansas Darter (*Etheostoma cragini*)

The Arkansas darter is a state threatened species that has been found south of Colorado Springs in natural springs adjacent to Fountain Creek. The study area does not extend to the identified darter populations. The Proposed Action is not likely to adversely affect the continued existence of the species.

2.5.7 Preble's Meadow Jumping Mouse (*Zapus hudsonius preble*)

The Preble's Meadow Jumping Mouse is currently classified by the USFWS as threatened. Mouse populations and habitat have been identified within the study area. The Proposed Action would definitely affect this species. A Programmatic Biological Assessment of this species was prepared by CDOT as part of this project, and a Programmatic Biological Assessment was issued by USFWS in August 2003.

2.5.8 Mountain Plover (*Charadrius montana*)

The mountain plover is a Colorado species of concern. Plovers are summer residents of Colorado's eastern plains. They prefer short, overgrazed grass prairies where cacti and prairie dog towns are present. There was no evidence of plover nesting within the study area during the investigation, but plovers may travel across or rarely visit lands within the study area. The Proposed Action is not likely to adversely affect the continued existence of the species.

2.5.9 Swift Fox (*Vulpes velox*)

The swift fox is no longer a candidate species for listing under the ESA; however, the swift fox remains a state species of concern (USFWS, 2001). Typical habitat of this fox species consists of shortgrass, mixed grass, and sand hill prairies that are relatively flat, gentle

rolling topography. Dens were not evident during the sight visit within the study area. Potential swift fox foraging habitat does lie within the subject study area; however, due to the already degraded condition of the area, it is unlikely that the Proposed Action would adversely affect the continued existence of the species.

2.5.10 American Peregrine Falcon (*Falco peregrinus anatum*)

The American peregrine falcon is a Colorado species of concern. The falcon is a medium-sized migratory raptor that resides in the mountains during summer, typically found on cliffs that tend to dominate the surrounding landscape (Colorado Birds, 1992). The falcon has also been found to utilize other features for nesting, such as river cutbanks, tall trees, and man-made structures including tall towers and ledges of tall buildings. The falcon may fly 10 to 12 miles from its nest sites in search of prey, which typically consists of small- to medium-size avian species such as blue jays, flickers, meadowlarks, pigeons, starlings, shorebirds, waterfowl, and many others. The prey species are usually hunted over open habitats such as waterways, fields, and wetlands (USFWS, American Peregrine Falcon Species Accounts). Peregrine falcons are known to inhabit the region. Although no falcons were observed in the study area, the open grasslands, wetlands, and riparian corridors throughout the study area may provide potential feeding habitat for the species. The falcon may travel across or rarely visit lands within the study area, but the disturbed nature of the area limits the quality of potential habitat utilized by the species. The Proposed Action is not likely to adversely affect the continued existence of the species.

2.5.11 Northern Leopard Frog (*Rana pipiens*)

Subsequent to the identification of the above species by USFWS in 2001, it has also been determined that the Northern leopard frog (*Rana pipiens*) is a State Species of Special Concern that is known to occur in the study area. This insect-eating frog lives primarily in riparian areas, and is likely present in many of the drainages that offer suitable habitat for the Preble's meadow jumping mouse. Habitat protection and enhancement efforts undertaken for the threatened mouse in the study area will generally be of benefit to this non-protected amphibian.

2.5.12 Black-tailed Prairie Dogs (*Cynomys ludovicianus*)

Prairie dogs have become an important political, social, economic, and ecological issue in the Front Range region of Colorado. Nationally, less than two percent of pre-settlement prairie dog populations exist today, due to a combination of habitat loss and targeted extermination. The U.S. Fish and Wildlife Service has determined that adding the black-tailed prairie dog to the federal list of threatened or endangered species is "warranted" but "precluded" at this time due to administrative and fiscal limitation within the agency.

Black-tailed prairie dogs are diurnal, colonial, burrowing rodents. These prairie dogs are herbivores and feed on a variety of vegetation including grasses and forbs, and to a lesser extent seeds and insects. Short-grass species commonly eaten by prairie dogs include buffalo grass and blue grama. Prairie dogs play an important role in the overall ecosystem, not only creating a unique ecosystem for their species, but they also create habitat and are a food source for a wide number of other federally or state-listed threatened or endangered species.

One colony of black-tailed prairie dogs is known within the study area. This community is located on the east side of I-25 extending from the intersection of SH 16 north approximately 3,000 feet by 1,000 feet wide (70 acres). As of a November 29, 2002 site visit, this colony was actively being disturbed by the property owner with site development.

Two other colonies of prairie dogs are found along I-25 in northern El Paso County. These are Gunnison's prairie dogs, not a threatened or endangered species, and not a Colorado Species of Special Concern. The first of these colonies is located on the west side of I-25 at the North Gate Boulevard interchange and extends approximately 600 feet by 200 feet (3 acres). The second is located on the west side of I-25 near Teachout, Creek approximately 8,800 feet (1.7 miles) south of the SH 105 and I-25 interchange. This community is bisected by Teachout Creek and is approximately 500 feet by 500 feet (6 acres) on the north side of the Creek and 600 feet by 150 feet (2 acres) on the south side of the Creek.

2.6 Colorado Division of Wildlife

Interviews with the regional representative of the Colorado Division of Wildlife (CDOW), Southeast Region Service Center were conducted to gather local knowledge and review data files on known wildlife movement corridors and wildlife concentration areas in or adjacent to the study area. The CDOW representative stated that limited movement across I-25 from west to east occurs due to the presence of large-scale urbanization. Mule deer, elk, and moose, as well as small mammals, are known to utilize riparian areas and underpasses as shelter and movement corridors across the highway. Review of the CDOW database revealed only one known wildlife concentration area in the project area. The area is a mule deer concentration area and is located primarily on the west side of I-25, approximately 2,000 feet south of I-25 exit 147 (Attachment B, pages 18 and 19). The area also extends on the east side of I-25 along Monument Creek, but access is limited by a relatively small (3'x3') box culvert.

2.7 Colorado Natural Heritage Program Potential Conservation Areas (PCA)

The CNHP has defined Potential Conservation Areas (PCA) through out El Paso County. PCAs are identified as those areas that most merit conservation efforts, but CNHP emphasizes that protecting only these sites will not adequately protect all the biodiversity values in El Paso County. PCAs may include a single occurrence of a rare element or a suite of element occurrences. The PCA boundaries do not confer any regulatory protection, but are intended to support planning and decision making for the conservation of these significant areas. The goal of the PCA process is to identify a land area that can provide the habitat and ecological processes upon which a particular element occurrence, or suite of element occurrences, depends for its continued existences (CNHP, December 2001). The Colorado Natural Heritage Program has identified three Potential Conservation Areas within the study area (Attachment A). Disturbances within the PCAs as a result of the Proposed Action should be minimized to the greatest extent practical and, where feasible, the ecological characteristic of the natural resources should be protected and/or enhanced.

2.7.1 Monument Creek PCA

The Monument Creek PCA extends from the Town of Monument to the northern border of Colorado Springs. It encompasses the length of Monument Creek plus all eastern tributaries and most western, including Dirty Woman, Jackson Creek, Smith Creek, Monument Branch, Black Squirrel Creek, and Kettle Creek (all crossing the study area). The PCA is considered of high significance because of a large population of Preble's meadow jumping mouse (CNHP, December 2001). Monument Creek and the eastern tributaries that cross the study area are characterized by riparian corridors dominated by sandbar willow (*Salix exigua*), peachleaf willow, crack willow, plains cottonwood, Russian olive, and wild plum (*Prunus americana*). These corridors across the study area provide critical movement corridors for not only the mouse, but also numerous mammals and other wildlife. Most of the creeks crossing under I-25 in this PCA are of relatively large size, providing easy movement for even the largest mammals. Tracks of mule deer and other small mammals crossing through the culverts were observed. Maintaining these movement corridors across I-25 is critical in ensuring continued existence of Preble's Meadow Jumping Mouse and diversity of wildlife on either side of the study area.

2.7.2 Monument Southeast PCA

The Monument Southeast PCA is located approximately one-quarter mile to the southeast of Monument, Colorado along a 3-mile stretch of I-25. Dirty Woman Creek flows along Walker Road and lies just outside the northern boundary of the PCA. Jackson Creek lies outside the southern and southeastern edges of the PCA. Teachout Creek lies to the south of Higby Road, traversing the central portion of the PCA. This PCA is characterized by a mixture of flat areas and gently rolling terrain, but also includes several hilly areas associated with creek systems. Historically, much of this area was a native shortgrass prairie, but development and agricultural uses over the past 150 years have converted most of this native ecosystem to disturbed old field habitat dominated by non-native grasses and weeds (CNHP, December 2001). The boundary for this PCA encompasses four known prairie dog colonies and the unoccupied space among these colonies. Of these four known colonies, only one has been identified within the limits of the study area which is located on the northwestern side of the Northgate Boulevard/I-25 interchange at the entrance to the Air Force Academy.

2.7.3 Widefield Fountain PCA

The Widefield Fountain site includes a relatively flat, low lying strip of land along Fountain Creek that extends southward from Academy Boulevard to Wigwam Road. Bounded on the west by I-25, the PCA varies in width from 0.7 to about 2.3 miles. This PCA supports at least nine occurrences of black-tailed prairie dog and four great blue heron rookeries (CNHP, December 2001). The riparian community of Fountain Creek is characterized as having a year-round water source and a high vegetation diversity from large mature cottonwoods to dense shrub understories, all essential habitat elements for a wide variety of migratory birds and wildlife. Of the nine known prairie dog occurrences and four heron rookeries, only one prairie dog colony has been identified within the study area. This colony is located at the extreme southern end of the study area extending from the SH 16/I-25 interchange north approximately 2,500 feet and from the east side of I-25 to the riparian edge of Fountain Creek.

3.0 Methodology

Existing conditions of wildlife and vegetative communities have been documented through a combination of direct field surveys, aerial photo interpretation, review of existing literature, and personal communication with leading experts. Wildlife biologists and wetland ecologists conducted field surveys of the study area. The survey included extensive investigation and delineation of vegetation communities and wildlife habitats over a three-month period extending from September through November 2000. A project ecologist also conducted numerous follow-up field surveys during the summer of 2002. Project aerial photography and mapping was utilized to identify major natural features and locations. The study area was then traversed for delineation and documentation.

Potential direct impacts to specific habitat types were estimated based on comparison of existing conditions mapping and the proposed project design plans (Refer to Appendix B). Cumulative and indirect impact analysis was based more on literature-based scientific philosophies of human influences on wildlife/vegetation population dynamics.

4.0 Impacts of No-Action Alternative

The No-Action Alternative would have no new direct impacts on vegetation communities. Degradation from the use and maintenance of the existing interstate highway will continue to promote conditions for exotic and noxious species to establish and create limited vegetation diversity. The State's noxious weed control program will attempt to limit the spread and development of noxious weeds within highway right-of-way.

The No-Action Alternative would have no new direct impacts on wildlife or wildlife habitat. Wildlife disruption from interstate noise and activity would continue to displace wildlife from the area. The interstate highway will also continue to be a barrier to wildlife movement, and will perpetuate existing habitat fragmentation.

5.0 Direct Impacts of Proposed Action

The proposed I-25 improvement project will result in direct loss of and disturbance to existing vegetation communities, wildlife, and wildlife habitat.

Direct impacts to existing vegetation communities and wildlife would occur under the Proposed Action as a result of clearing and grading for the proposed I-25 improvements and associated interchange work. Project components that would result in direct impact include road-widening within the right-of-way, other highway improvements, crossing of creeks and drainages, and interchange construction. These activities would result in removal and permanent loss of existing vegetation and potential disruption or loss of wildlife and wildlife habitat.

5.1 Road Widening within Right-of-Way

Much of the proposed road widening improvements would occur in the existing right-of-way resulting in loss or disturbance of previously disturbed grassland communities. These areas were historically cleared, graded, and eventually reseeded during the original construction of I-25 and are currently dominated by non-native grasses and weeds. These areas also are routinely disturbed from maintenance operations within the right-of-way (i.e., mowing, spraying, snow plowing). Disturbance and loss of these roadside grassland communities within the right-of-way would total approximately 222 acres. This number was derived assuming a potential disturbance area extending 100 feet from the existing edge of pavement, including median vegetation and excluding interchange disturbances along the entire I-25 corridor within the study area.

Road widening would result in the direct loss of approximately 3.9 acres of ponderosa pine forest community. This community type is generally less disturbed than others within the study area and provides a diverse, relatively higher quality habitat for a wide variety of wildlife.

Numerous single and small clusters of trees would also be directly impacted from the road widening activity. Based on analysis of project aerial photography, an estimated 300 to 400 mature isolated trees would be removed, not including calculated impacts to forested communities associated with interchanges or riparian crossings discussed below. Trees that would be removed including both native and non-native species such as plains cottonwood, peach leaf willow, Siberian elm, Russian elm, crack willow, black locust, and tamarisk. The tamarisk is a species that has been identified for eradication under Executive Order D0002-03 issued by Colorado's Governor in 2003.

The direct loss of non-developed land and the vegetation communities described above would also result in that equal amount of land no longer available for use by wildlife. The direct loss of this currently available land would result in further displacement of wildlife and potential decline in species diversity and quantity in the general vicinity of the study area.

The study area contains 14 creeks and numerous drainages. Dirty Woman Creek, Teachout Creek, Jackson Creek, Smith Creek, Monument Branch, Black Squirrel Creek, Kettle Creek, Pine Creek, Cottonwood Creek, Monument Creek, Douglas Creek, Fountain Creek, Bear Creek, and Cheyenne Creek all form well-defined riparian corridors that are crossed by the mainline of I-25. In the context of this report, the riparian corridor refers to the entire ecosystem connected to the creek consisting of the physical channel, banks, wetland vegetation and associated upland area and vegetation. These corridors are some of the most biologically diverse habitats within the study area due to having a consistent source of water and providing structural habitat diversity utilized by a wide variety of wildlife. Often these corridors, although highly disturbed, provide the only natural environment in a highly urbanized setting. These riparian corridors serve as the only passable wildlife movement corridors for wildlife across I-25.

Through the study area, I-25 acts as a relatively impassable barrier to most wildlife except where bridges span riparian corridors or where large diameter culverts exist under I-25. These larger corridors or passages create the only relatively unobstructed and sheltered movement corridors for large and small mammals such as deer, elk, coyotes, and raccoon to cross I-25. Many smaller diameter culverts crossing I-25 also permit the passage of smaller mammals. Preble's mouse studies in the study area by Ensign Technical Services, Inc. (Bakeman, April 20, 2001) determined that drainages crossing I-25 do not act as a barrier to small rodents at a majority of sites, but rather serves as a filter allowing some movement of animals under I-25. This would indicate that existing conditions cause a similar filtering to occur for other small mammals.

In addition to the riparian corridors and vegetation communities discussed, numerous wetland habitats have been identified with the study area. A total of 96.032 acres of jurisdictional waters of the US, including wetlands, have been identified and mapped within the study area. Generally, wetlands are considered of high value to wildlife due the presence of a water source, varied soil moisture regimes, and vegetation diversity.

Most of the wetland habitat identified in the study area that is not associated with the 14 riparian corridors is of relatively low quality. These wetland areas are located directly adjacent to existing traffic lanes, and are seriously degraded from traffic, highway maintenance, erosion, exotic vegetative species, weed infestation, and pollution. These features commonly include man-made stormwater channels, hydrologically isolated wetlands, or roadside swales. Approximately 10.22 acres of direct wetland habitat loss is anticipated to occur as a result of the Proposed Action (Walsh, 2002).

The crossings of Dirty Woman Creek, Jackson Creek, Smith Creek, Monument Branch Creek, Black Squirrel Creek, Cottonwood Creek, Monument Creek, Douglas Creek, Fountain Creek, and Bear Creek under I-25 have been identified as the primary wildlife movement corridors and general larger blocks of wildlife habitat in the study area. Direct impacts would occur at each of these locations as part of the Proposed Action. The width of bridge spans or the length of culverts will increase as part of road widening and improvements as well as the temporary disruption of the corridors during construction and the loss of mature vegetation in each area.

Excluding wetland communities and direct impacts from interchange construction, approximately 13 acres of riparian corridor would be directly impacted by the Proposed Action. These few crossings are critical to maintaining available wildlife habitat and biodiversity in such a highly urbanized area and should be enhanced to promote wildlife use to the greatest extent possible. The direct loss of these habitats would result in the permanent displacement of wildlife species currently utilizing each site. Long-term effects are more difficult to quantify but would likely result in further permanent displacement of wildlife species and a potential decline in species diversity and abundance in the general vicinity of each side of I-25.

5.2 Interchange Construction

The Proposed Action includes alteration of the following I-25 interchanges: Baptist Road (Exit 158), North Gate Boulevard (Exit 156), Nevada/Rockrimmon (Exit 147), Garden of the Gods (Exit 146), Fillmore Street (Exit 145), and Cimarron/Bijou (Exits 142 and 141). Modifications at Garden of the Gods Road would be minor; all of the other listed interchanges would undergo major reconstruction. A description of impacts at each of these intersections is presented below.

5.2.1 Baptist Road Interchange

The general vicinity of the Baptist Road Interchange contains numerous natural features of ecological value. A relatively diverse wetland complex (Area AZ) exists on the east side of I-25, south of Baptist Road, which includes wet meadows and willow shrubland. On the outer fringes of the wetland complex exists a relatively undisturbed shortgrass prairie grassland, gamble oak shrubland and several large mature cottonwood trees. Immediately south of the Baptist interchange, on the west side of I-25 where Jackson Creek crosses I-25, a multi-age stand of cottonwood trees exists along the delineated wetlands (D) of Jackson Creek. The Baptist Road Interchange improvements will include a new ramp south of Baptist Road on the east side of I-25, widening of existing road surfaces, and general improvements. Construction of the new east side ramp will result in direct loss of approximately ten acres of shortgrass prairie and 1.6 acres of shrubland vegetation communities. Mainline I-25 widening at the crossing of Jackson Creek will result in disturbance of approximately two acres of the riparian deciduous tree community, removing up to six mature trees. Loss of the disturbed roadside grassland community would total approximately ten acres.

Primary disturbance to wildlife associated with this interchange construction will be the fragmentation of habitat associated with the east side ramp and the lengthening of the Jackson Creek crossing under I-25. The east side ramp would fragment the relatively diverse wetland/upland complex limiting the potential movement of many wildlife species into and out of the Jackson Creek corridor in the east. In addition, the widening of the mainline I-25 over Jackson Creek will increase the length of the crossing from the current 105 feet to an estimated 292 feet.

5.2.2 North Gate Boulevard Interchange

The North Gate Interchange contains numerous natural features of ecological value. Smith Creek crosses under the northbound and southbound lanes of I-25 through two large box culverts. A relatively dense, mature riparian deciduous tree community lines the banks and associated wetland complex of Smith Creek. Shortgrass prairie and disturbed roadside grasslands dominate the majority of the general area. On the west side of I-25 south of Northgate Boulevard, a large expanse of relatively undisturbed ponderosa pine forest and shortgrass prairie exists. On the east side of I-25 south of Smith Creek, a large expanse of disturbed grassland exists.

The North Gate Interchange construction would include the widening of existing road surfaces as well as new on and off ramps on the east and west side of the mainline I-25. In addition to the reconstruction for existing traffic movements, the future Powers Boulevard would potentially be incorporated into this interchange. The study area included the Powers Boulevard connection from I-25 to its first interchange, Voyager Parkway. The new ramps extend approximately 400 feet towards the east and west from the existing edge of pavement. Construction would result in the loss and disturbance to approximately 17 acres of shortgrass prairie, 35 acres of disturbed grasslands, two acres of riparian deciduous trees community (approximately 45 mature trees), and one acre of ponderosa pine community (approximately 35 mature trees).

Primary disturbance to wildlife associated with the interchange construction would result from the additional crossings of Smith Creek and general loss of undeveloped land and vegetation. The proposed improvements on the east side of I-25 would create one additional crossing of Smith Creek of approximately 145 feet in length along the riparian corridor, due to a new off-ramp. Widening of the existing northbound mainline will increase the length of the current 114-foot crossing to approximately 250 feet. Proposed improvements on the west side of I-25 would create one additional crossing of Smith Creek of up to 145 feet (due to a new on-ramp) and extend the existing 130-foot mainline crossing to 225 feet. The road crossing of the Smith Creek riparian corridor will result in further fragmentation of wildlife habitat and decrease the potential of wildlife movement across I-25.

5.2.3 North Nevada/Rockrimmon Interchange

The North Nevada/Rockrimmon interchange proposed construction limits would result in disturbance to existing vegetation and wildlife. At this interchange, I-25 spans Monument Creek with two separated bridges each approximately 50 feet wide. These bridges are relatively high above the ground surface of Monument Creek and are approximately 400 feet long. Proposed project improvements across Monument Creek would include the expansion of the two existing bridges and the construction of a third bridge. Although the Monument Creek channel is highly disturbed in this area, the underpass area is well vegetated with a mix of wetland grasses and shrubs as well as riparian deciduous trees lining either bank. This vegetation provides shelter along the corridor that is currently heavily used by wildlife, as indicated by the tracks observed in the area.

Along the southeastern bank of Monument Creek, a relatively large (16 acres) and mature cottonwood stand exists, providing one of the higher quality riparian deciduous tree communities found in the study area. The Proposed Action does not appear to impact this area, but every effort should be made to preserve this area. Approximately one acre of riparian deciduous tree community would be disturbed with the removal of up to 25 mature trees and an additional approximately 80 isolated mature trees. Approximately 12 acres of disturbed right-of-way grassland community would also be directly impacted as part of the interchange and immediate road widening.

Primary disturbance to wildlife associated with the interchange improvements would be the additional coverage from the widening of the Monument Creek bridges and the general loss of mature trees and undeveloped land. The proposed bridges would increase ground coverage of the overpass by up to 100 feet. Although the final bridge spans will be high enough above the ground surface not to limit wildlife movement, temporary disturbance of the corridor and habitat would occur during construction.

5.2.4 Garden of the Gods Interchange

Minor modifications to the Garden of the Gods interchange would not result in additional direct impact of vegetation communities. The entire area of proposed disturbance is currently part of the existing roadway system.

5.2.5 Fillmore Street Interchange

The Fillmore Street interchange would not result in additional loss of vegetation communities. The entire area of proposed disturbance currently is part of the I-25 road system or is developed urban land. Isolated “backyard” landscape will be removed west of I-25 south of Fillmore Street.

5.2.6 Cimarron/Bijou Interchange

The Cimarron/Bijou Interchange proposed construction limits would occur in the general vicinity of the confluence of Fountain Creek and Monument Creek. Although a highly disturbed and urbanized riparian area, several vegetation communities are present. Riparian deciduous tree communities line both creek channels consisting of relatively large, mature plains cottonwood, Siberian elm, and crack willow. Wetland communities have been identified in the vicinity. Limits of construction boundaries will directly impact approximately seven acres of riparian deciduous tree community, removing up to 25 large mature trees along Fountain Creek and up to ten additional isolated trees in the general area. Grading and improvements would also directly impact approximately ten acres of disturbed roadside grassland.

Primary disturbance to wildlife associated with the interchange construction would occur from the disruption and removal of vegetation associated with the confluence of Fountain and Monument Creeks. As stated previously, these areas are currently highly disturbed and urbanized riparian corridors, but the confluence does provide the only large connection of the Fountain Creek drainage to the Monument Creek drainage. Wildlife including deer and beaver were observed utilizing this riparian corridor connection. The Proposed Action would result in the potential temporary disruption of the corridor to wildlife, the direct loss of mature vegetation as habitat, and the widening of the overpasses reducing riparian habitat by up to 100 feet.

5.3 Preble’s Meadow Jumping Mouse

The I-25 corridor project in El Paso County will affect populations and habitat of the Preble’s meadow jumping mouse (*Zapus hudsonius preblei*). This small mammal was listed as threatened under provisions of the Endangered Species Act in 1998; the listing was primarily due to loss and degradation of Preble’s riparian habitat.

Preble's habitat and populations will be affected along a 9.2 mile stretch of I-25 in northern El Paso County from highway improvement projects. I-25 crosses several small streams that are tributaries of Monument Creek, and almost all of these drainages have Preble's populations.

The FHWA and CDOT have prepared a programmatic biological assessment (PBA) to identify these impacts and various conservation measures that will be taken to offset impacts. The PBA contains details on project activities that affect Preble's, biological consequences of these actions, cumulative effects, effects on proposed critical habitat, and an amendment process.

The Proposed Action includes widening I-25 by adding one or more lanes in each direction, and rebuilding two interchanges in areas where there is Preble's habitat. Habitat within the corridor was identified, and project impacts were overlaid on habitat maps. Some of the project impact areas would take place within areas that have been proposed as critical habitat by the U.S. Fish and Wildlife Service (USFWS). Project impacts would take place in both riparian and adjacent upland habitat areas, with most impact areas in close proximity to the existing highway.

FHWA and CDOT conducted two workshops with environmental and design engineer staff to identify areas where proposed impacts could be avoided or minimized. Following avoidance and minimization steps, there will be total of 21.20 acres of permanent impact and 26 acres of temporary impact that will adversely affect Preble's habitat and populations. It is anticipated that these impacts are worst-case scenarios and that there will be opportunities to further reduce impacts during the final design phase.

Although the project will result in alteration and loss of habitat, it will not cause habitat fragmentation and loss of connectivity within and between populations in the project areas once project restoration is complete. Habitat connectivity and mouse mobility will improve at some project sites by improved culvert and bridge designs. Most project actions will occur within habitat that supports low density Preble's populations, and the nature of the impacts and subsequent restoration actions will allow populations in project areas to recover, including areas that have critical habitat.

5.4 Summary of Direct Impacts

No federal or state laws regulate the disturbance or removal of vegetation communities or wildlife habitats outside of the context of the Clean Water Act (wetlands) or the Endangered Species Act (critical wildlife habitat). The majority of the disturbances identified in this study are not regulated, and, therefore, there are no established guidelines for quantifying what an impact is or what appropriate mitigation measures may be. This is especially true regarding such generalized subjects as "vegetation communities" and "wildlife." This study attempts to summarize direct quantifiable impacts and discuss long-term trends associated with the action on the local natural resources.

In summary, vegetation communities, wildlife, and potential wildlife habitat would be directly impacted as part of the Proposed Action. Much of the vegetation and wildlife habitat is currently in a degraded state, containing exotic, invasive plant species in a highly urbanized area. Although degraded, the presence of any vegetation in an urbanized setting provides numerous benefits to the local environment. Vegetation not only provides wildlife habitat, but also plays an integral role in erosion prevention, flood attenuation, and general aesthetic value. Table 5-1 summarizes vegetation and wildlife issues identified as a direct result of the Proposed Action.

TABLE 5-1
Summary of Direct Impacts (in Acres) to Vegetative Communities

Activity	Grassland-short prairie	Grassland-disturbed roadside	Shrubland-gamble oak	Forested-riparian deciduous	Forested-ponderosa pine	Approx. number of mature trees to be removed
Road Widening	0	155	0	0	3.9	300-400
Riparian Corridor Crossings	0	0	0	13	0	200-300
Interchange-Baptist	10	10	1.6	2	0	6
Interchange-Northgate	17	35	0	2	1	80
Interchange-N. Nevada/Rockrimmon	0	12	0	1	0	105
Interchange-Garden of Gods	0	0	0	0		0
Interchange-Fillmore	0	0	0	0	0	0
Interchange-Cimarron	0	10	0	7	0	35
TOTAL	27	222	1.6	25	4.9	726-926

- Two colonies of Gunnison’s prairie dog have been identified within the study area. Direct impacts would occur to two Gunnison’s prairie dog colonies that are located near Teachout Creek and the North Gate Interchange as a result of the Proposed Action. A combined total of approximately 0.725 acre of Gunnison’s prairie dog colony would be directly impacted at these two locations. Normally, the impacts would require removal of prairie dogs per CDOT specifications, and would result in temporary displacement of the species to areas undisturbed by the Proposed Action. However, since the colony at North Gate is located on United States Air Force Academy property, animals at this location will be handled in accordance with the Air Force Academy’s wildlife management plans.

- A third colony of prairie doges exists immediately northeast of the Interstate 25 at State Highway 16, at the southern limit of the study area. This is a colony of Black-tailed prairie dogs. This colony would not be directly impacted as a result of the Proposed Action. However, during a November 29, 2002 field visit, this colony was actively being disturbed by the property owner with site development.
- One mule deer concentration area has been identified within the study area. Approximately five acres of this area would be disturbed as a result of the Proposed Action. The area of disturbance is relatively small compared to the entire concentration area and is also of a relatively degraded nature. The disturbance would result in the loss of this habitat for potential use of the mule deer and may further displace the species from the immediate area.
- General loss of habitat and decreased biodiversity from removal of existing vegetation communities and loss of undeveloped land would occur.
- Wildlife avoidance of the I-25 corridor would increase temporarily and permanently from the additional activity.
- Wildlife mortality (road kill) would increase with increased traffic volume and newly constructed interchanges.
- Fragmentation of existing wildlife habitat would occur as a result of the Proposed Action.
- Other than the Preble's Meadow Jumping Mouse addressed by others, no species listed as threatened or endangered would likely be directly impacted as a result of the Proposed Action.
- Noxious weeds are present within the study area and would be managed in accordance with CDOT policy under either the No-Action Alternative or the Proposed Action. The Proposed Action involves large amounts of soil disturbance and would necessitate relatively greater weed management efforts.

6.0 Indirect Impacts of Proposed Action

Indirect impacts will potentially occur to vegetation communities and wildlife as a result of the Proposed Action. Quantifying indirect impacts of the Proposed Action on vegetation communities and wildlife is not possible to predict, but generalization of similar observed trends is more reasonable to predict. Generally, indirect impacts are considered as secondary impacts which are a consequences of direct impacts. Indirect impacts may not be noticeable or measurable immediately upon completion of a project but may develop over many years. Direct impacts of the Proposed Action identified in this study relate to the direct loss of specific vegetation communities or wildlife habitat. Indirect impacts of the Proposed Action may be related more to potential alterations or adaptations of existing vegetation communities, wildlife habitats or wildlife utilization.

Vegetation community species composition typically tend to adapt or alter in response to alterations of the general surrounding environment. Modification of local hydrological patterns, volumes, frequencies or water quality can result in adaptation and/or alteration of vegetation communities. The removal of mature tree canopies which provide ground shading can result in alteration of vegetation species composition to those species more adapted to direct sun. The introduction of noxious or exotic weeds from earth disturbance can also alter a species composition within a vegetation community by out competing existing species. Indirect impacts to wildlife associated with the proposed impacts generally would include a displacement of wildlife from the immediate area due to habitat alterations and fragmentation as well as an increase in human/wildlife conflicts.

7.0 Mitigation

Proposed mitigation for the Proposed Action is detailed below under sections addressing Wildlife, Threatened/Endangered Species, Vegetation, and Noxious Weeds.

7.1 Wildlife

Mitigation efforts focus on avoiding and minimizing construction disturbances to vegetation communities and wildlife habitats, reestablishing lost habitats in-place, and enhancing existing natural features.

The following actions have been identified to mitigate the effects of the Proposed Action on the wildlife within the study area and the local region:

- Implement the noxious weed management plan developed for this project for areas of ground disturbance.
- Re-vegetate the project area to replicate or enhance impacted wildlife habitats.
- Minimize construction disturbance to the greatest extent feasible by implementing site-specific construction best management practices.
- Design hydraulic structures (e.g., culverts, box structures, and bridges) to improve corridor east/west movement. To the extent feasible, new or reconstructed stream crossings under I-25 will incorporate a soft natural bottom and will be vegetated.
- Where feasible, use native grass, shrub, and tree species to create sight and sound buffer zones from I-25.
- Select plants for re-vegetation to avoid enticing wildlife to encroach into the highway area and to not establish hiding places for wildlife adjacent to the roadway, for the mutual safety of the animals and motorists alike.

Prior to construction, in places where large trees will be removed, field surveys will be conducted to look for birds, particularly migratory birds, that are protected by the Migratory Bird Treaty Act and other federal laws. Federal permits are required to take, possess, transport, and dispose of migratory birds, bird parts, feathers, nests, or eggs. If applicable, permits will be obtained from the U.S. Fish and Wildlife Service Migratory Bird Permit Office.

Air Force Academy Wildlife Coordination

Many of the above wildlife-oriented mitigation efforts apply especially on the grounds of the USAFA. Through the design and construction processes, coordination with USAFA personnel will be maintained to ensure that I-25 re-vegetation plans are consistent with the Academy's wildlife management objectives.

Prior to construction, USAFA officials will be consulted to determine whether the impacted Gunnison's prairie dogs at the North Gate interchange colony should be captured and relocated to other appropriate habitat on USAFA property. CDOT will cooperate with USAFA to comply with any specific Air Force requirements applicable to prairie dogs on military property. Ordinarily, on civilian property, the animals would be captured and relocated if possible in accordance with the CDOT prairie dog policy and in coordination with the Colorado Division of Wildlife.

As requested by the USAFA, improvements will be designed to avoid creation of any new areas of open water in proximity to the Academy to minimize potential Bird/ Aircraft Strike Hazard for flight operations. The Academy's main airfield and auxiliary airfield are both very close to Interstate 25. Potential damage from collisions between aircraft and birds is a safety concern, particularly in the case of larger birds such as the migratory Canada goose.

Riparian Habitat Enhancement

In addition to the mitigation measures discussed above, specific conservation strategies have been developed to enhance, preserve, and restore habitat for the Preble's meadow jumping mouse. A key focus of these strategies is to re-establish habitat linkages between isolated populations of the Preble's mouse, both across (under) I-25 facility elsewhere upstream or downstream of the freeway. Those efforts would also be beneficial in providing habitat and movement corridors for other species.

CDOT is in the process of obtaining habitat easements and is purchasing land to preserve habitat for the Preble's mouse. These corridors will also serve other species and provide open space buffers for other species.

7.2 Threatened/Endangered Species

For several years, CDOT has cooperated with local authorities to develop a conservation strategy to support Preble's mouse recovery in the Monument Creek watershed. In the draft Preble's Recovery Plan, the U.S. Fish and Wildlife Service indicated that a single large Preble's mouse population (more than 2,500 animals or 50 connected stream miles) in the Monument Creek watershed was needed.

As part of this effort, a panel of Preble's mouse experts was convened by CDOT in 1999 to identify the most important regional issues for the Preble's mouse and potential conservation measures to address these issues. Some of the recommendations of the expert panel were further refined in a habitat modeling exercise conducted in 2001/2002. The panel identified isolation of small Preble's mouse populations as the greatest threat to long-term persistence in the Monument Creek watershed. There are at least six separate Preble's mouse populations in the watershed, and restoring habitat linkages among these populations was identified as the most important action to achieve recovery.

During 2002-2003, a Programmatic Biological Assessment was prepared to identify impacts from three State highway projects (I-25, Powers Boulevard, and the Shoup Road/SH83 intersection) and various conservation measures that will be taken to offset project impacts. This work was conducted in close consultation with the U.S. Fish and Wildlife Service.

The Programmatic Biological Assessment contains details on project activities that affect the Preble's mouse, biological consequences of these actions, cumulative effects, effects on proposed critical habitat, and an amendment process. The Programmatic Biological Assessment proposed onsite and offsite actions that would allow affected Preble's mouse populations to recover to pre-disturbance levels and would promote persistence of a large Preble's mouse population in El Paso County.

The U.S. Fish and Wildlife Service issued a Biological Opinion on August 4, 2003, finding that the Proposed Actions (I-25, Powers, Shoup Road/SH83) together with the proposed mitigation will not cause jeopardy to the Preble's meadow jumping mouse. The Biological Opinion is included in Section 8 of this EA.

Mitigation for the Proposed Action will be implemented in accordance with the Biological Opinion, which includes the following four elements:

1. Onsite actions will include restoration, enhancement, and creation of Preble's mouse habitat that is within or near project disturbance areas. Best management practices will be implemented as appropriate.
2. Offsite actions will include restoring habitat linkages in at least two areas and permanently protecting an additional 50 acres of habitat. Additional habitat restoration and enhancement will be conducted as needed.
3. Monitoring will be conducted to assure that disturbance areas do not exceed permitted amounts and to gage the success of restoration efforts. Special monitoring programs will be conducted at habitat linkage areas to determine the success of restoring connectivity among populations.
4. CDOT will sponsor a research project to determine the effectiveness of small mammal ledges in culverts. Successful treatments will be incorporated into future culvert design and construction.

7.3 Vegetation

The following mitigation measures have been identified to minimize the effects of the Proposed Action with respect to local vegetation:

- Re-vegetating impacted areas to replicate or enhance native vegetative communities. Vegetation planted along shoulders and in medians will be selected to not provide food or habitat for animals, so as not to attract them to the highway.
- Plant native trees where feasible in proximity to locations where trees are removed due to the Proposed Action.
- Minimizing construction disturbances to the greatest extent feasible by implementing construction best management practices.
- Enhancing and restoring the existing condition of the local vegetation communities, especially at bridge crossings over riparian corridors.

The use of best management practices will be required, during construction, to minimize the spread and development of noxious weeds. Best management practices include minimizing the construction disturbance area and length of time that the disturbed soils are exposed. All unavoidable disturbance areas will be quickly re-vegetated following construction activities using site-specific seed mixes and certified weed-free mulch or straw.

7.4 Noxious Weeds

CDOT has developed a standard protocol for weed management associated with highway projects. This protocol will be implemented prior to any earth disturbance. The protocol includes:

- mapping of all weed species within a project area
- long-term maintenance to control weed propagation
- re-establishment of native vegetation
- weed eradication methods

Proper implementation of a weed management plan would mitigate the potential adverse affects of earth disturbance and the establishment of noxious weeds.

CDOT will also undertake tamarisk eradication in conjunction with mitigation efforts to provide wetland replacement and habitat for the Preble's mouse.

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9.0 Attachments

- Attachment A Natural Heritage Program Potential Conservation Areas
Attachment B Project Mapping

ATTACHMENT A

Natural Heritage Program Potential Conservation Areas



Photo 1. Example of shortgrass prairie community in foreground, upland shrub community to the left and riparian deciduous tree community to the right.



Photo 2. Example of ponderosa pine forest community.



Photo 3. Example of roadside (right-of-way) disturbed grasslands.



Photo 4. Example of a high quality, properly functioning riparian corridor near study area.



Photo 5. Example of an interstate overpass of riparian corridor. (Monument Creek)



Photo 6. Example of wildlife use of overpasses of riparian corridors. (Fountain Creek)



Photo 7. Example of well vegetated and protected potential wildlife movement corridor under I-25.



Photo 8. Example of degraded riparian corridor of Monument Creek and I-25 crossing.



Photo 9. Example of I-25 overpass of Fountain Creek which is of adequate size and vegetated to permit movement of wildlife.

Monument Creek Potential Conservation Area

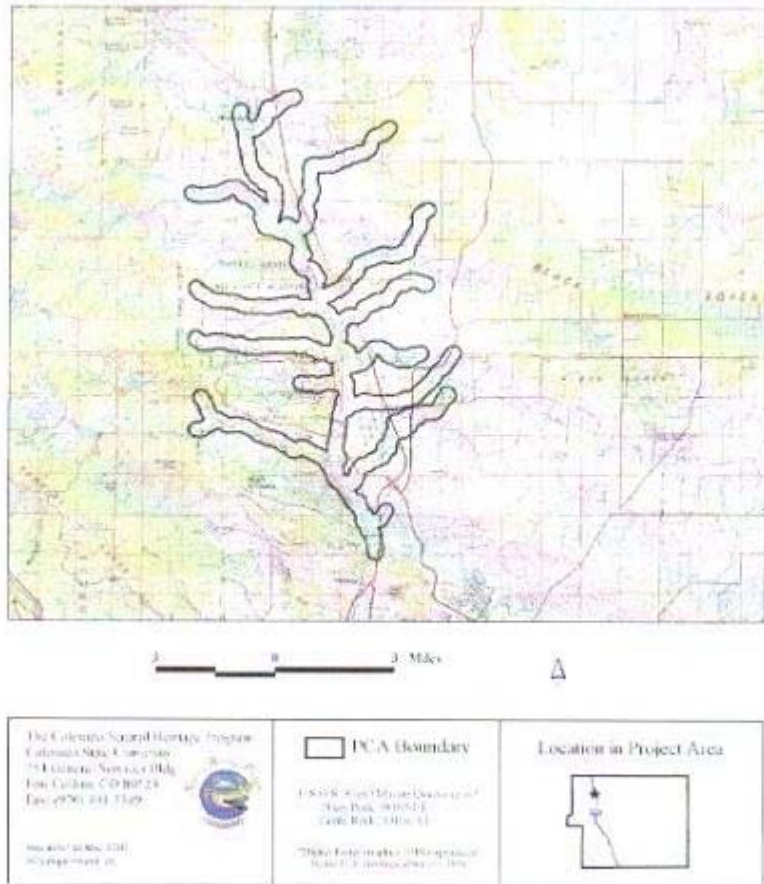


Fig. 17. Monument Creek Potential Conservation Area Map

Monument Southeast Potential Conservation Area

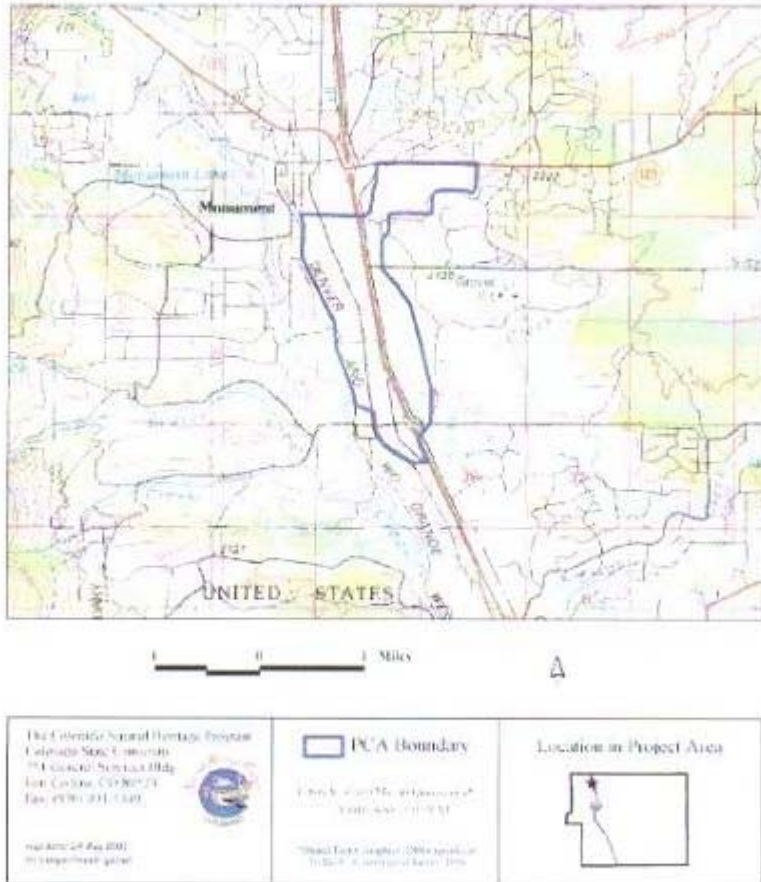


Fig. 47. Monument Southeast Potential Conservation Area Map

Widefield Fountain Potential Conservation Area

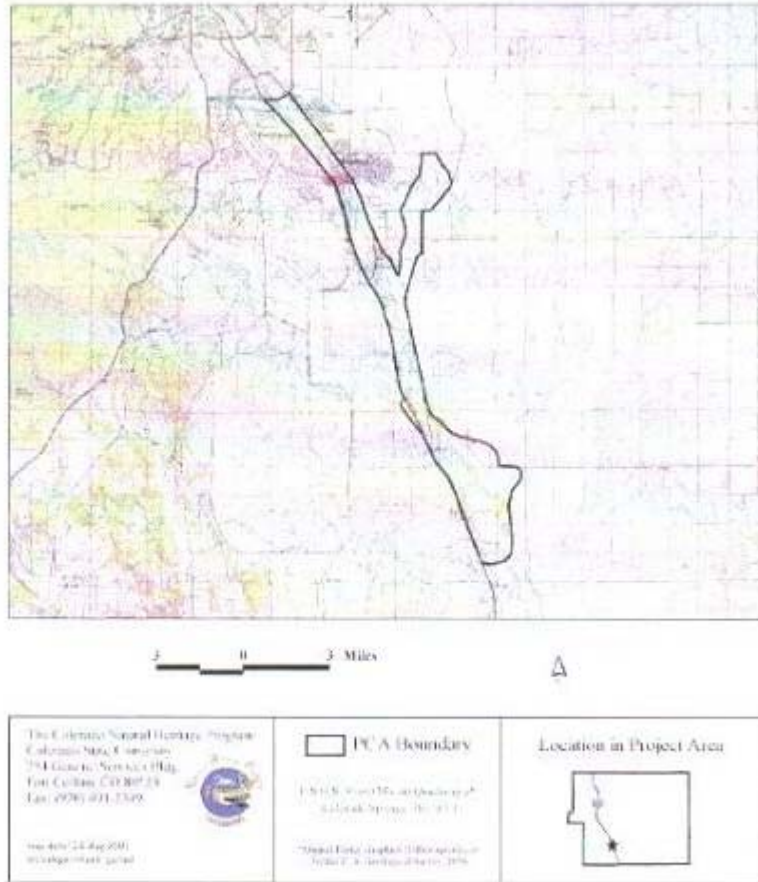
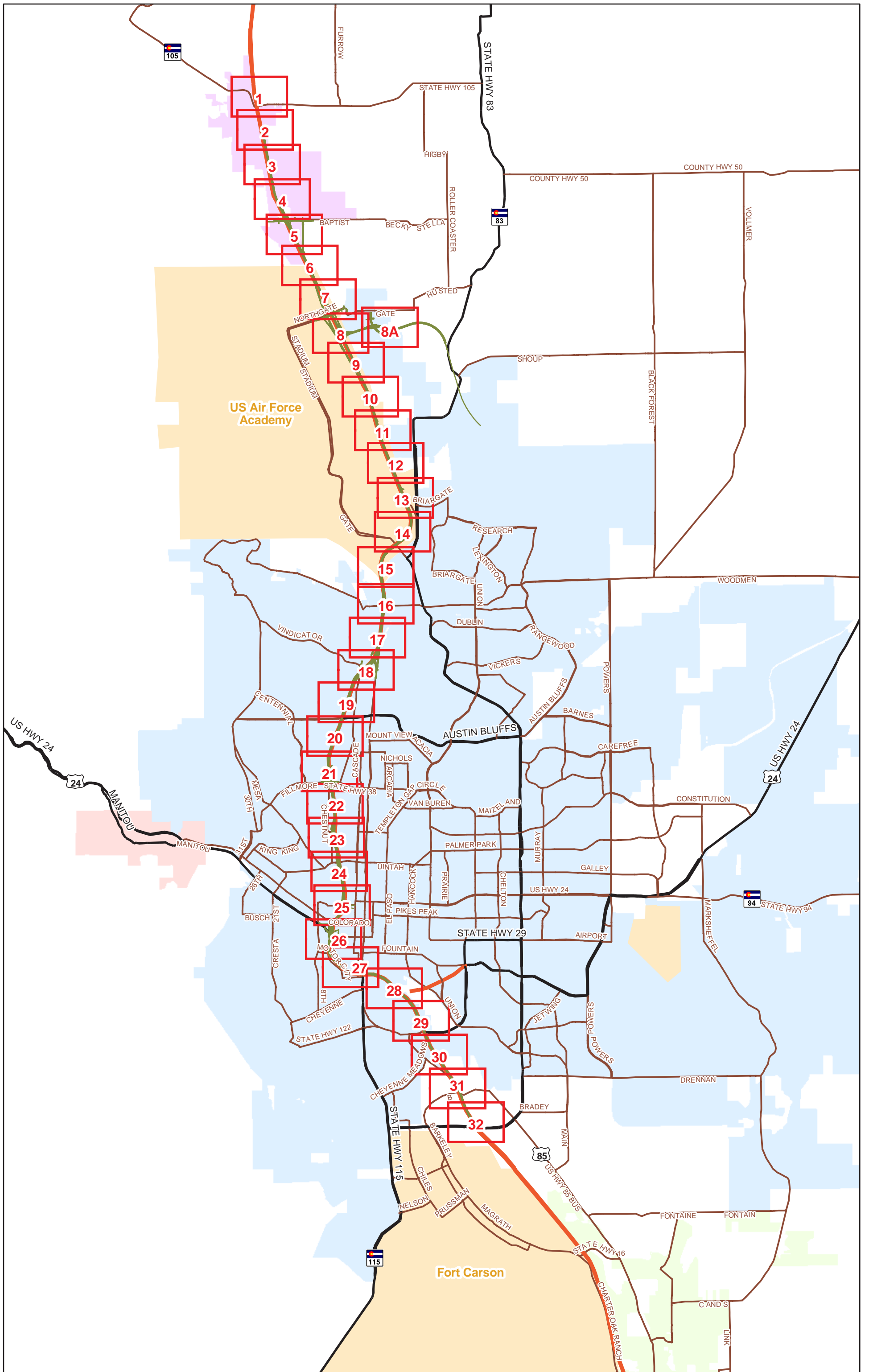
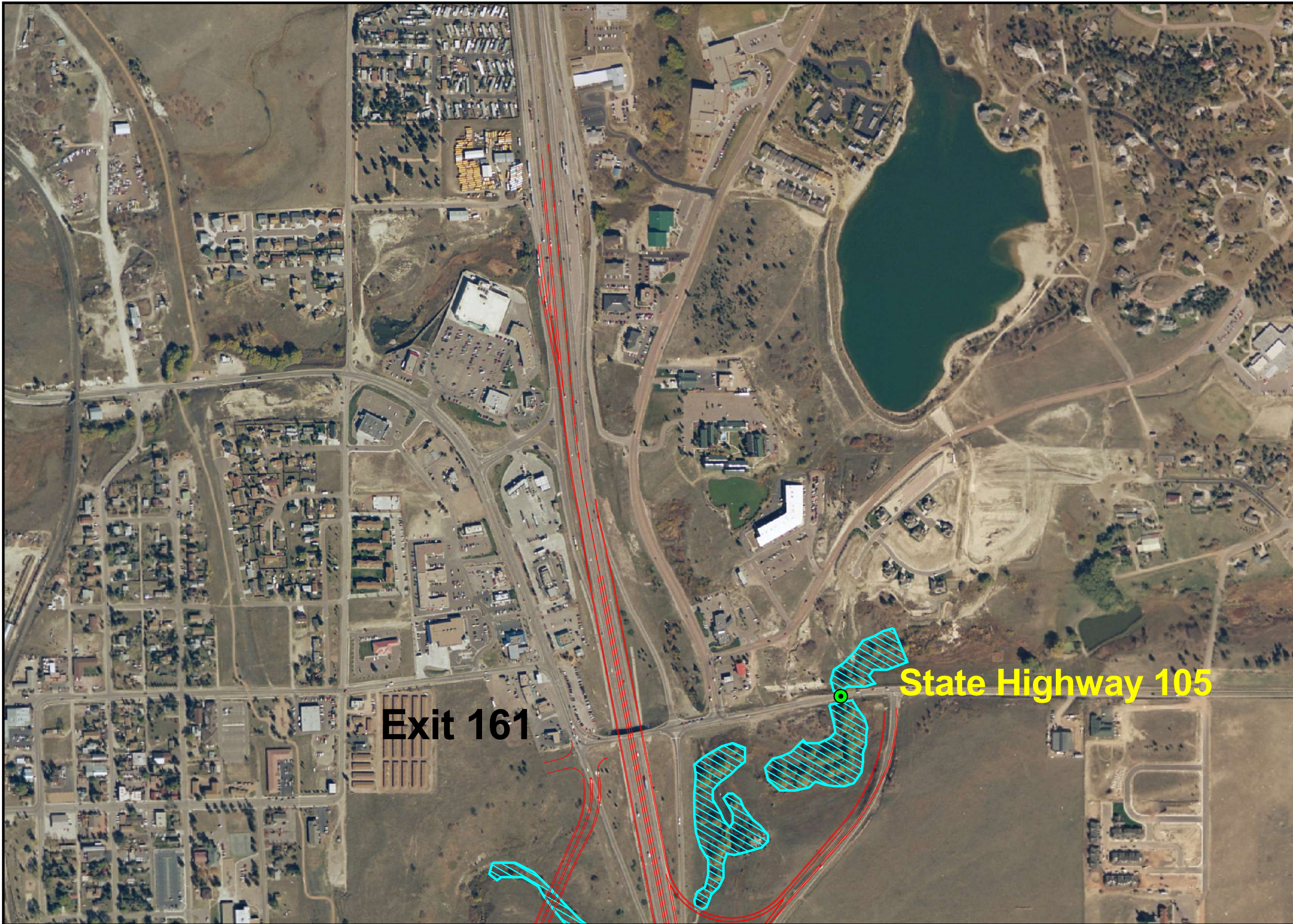


Fig. 49. Widefield Fountain Potential Conservation Area Map

ATTACHMENT B
Project Mapping





Exit 161

State Highway 105








- Potential Wildlife Movement Corridor
- Limit of Disturbance 10/30/02
- Roadway 10/30/02
- Riparian Deciduous Tree Community
- Upland Shrub Community
- Ponderosa Pine Community
- Mule Deer Concentration Area
- Prairie Dog Habitat
- Arkansas Darter

Scale: 1" = 500'



EXIT 161

2

-  Potential Wildlife Movement Corridor
-  Limit of Disturbance 10/30/02
-  Roadway 10/30/02
-  Riparian Deciduous Tree Community
-  Upland Shrub Community
-  Ponderosa Pine Community
-  Mule Deer Concentration Area
-  Prairie Dog Habitat
-  Arkansas Darter

Scale: 1" = 500'






- Potential Wildlife Movement Corridor
- Limit of Disturbance 10/30/02
- Roadway 10/30/02
- Riparian Deciduous Tree Community
- Upland Shrub Community
- Ponderosa Pine Community
- Mule Deer Concentration Area
- Prairie Dog Habitat
- Arkansas Darter

Scale: 1" = 500'










-  Potential Wildlife Movement Corridor
-  Limit of Disturbance 10/30/02
-  Roadway 10/30/02
-  Riparian Deciduous Tree Community
-  Upland Shrub Community
-  Ponderosa Pine Community
-  Mule Deer Concentration Area
-  Prairie Dog Habitat
-  Arkansas Darter

Scale: 1" = 500'

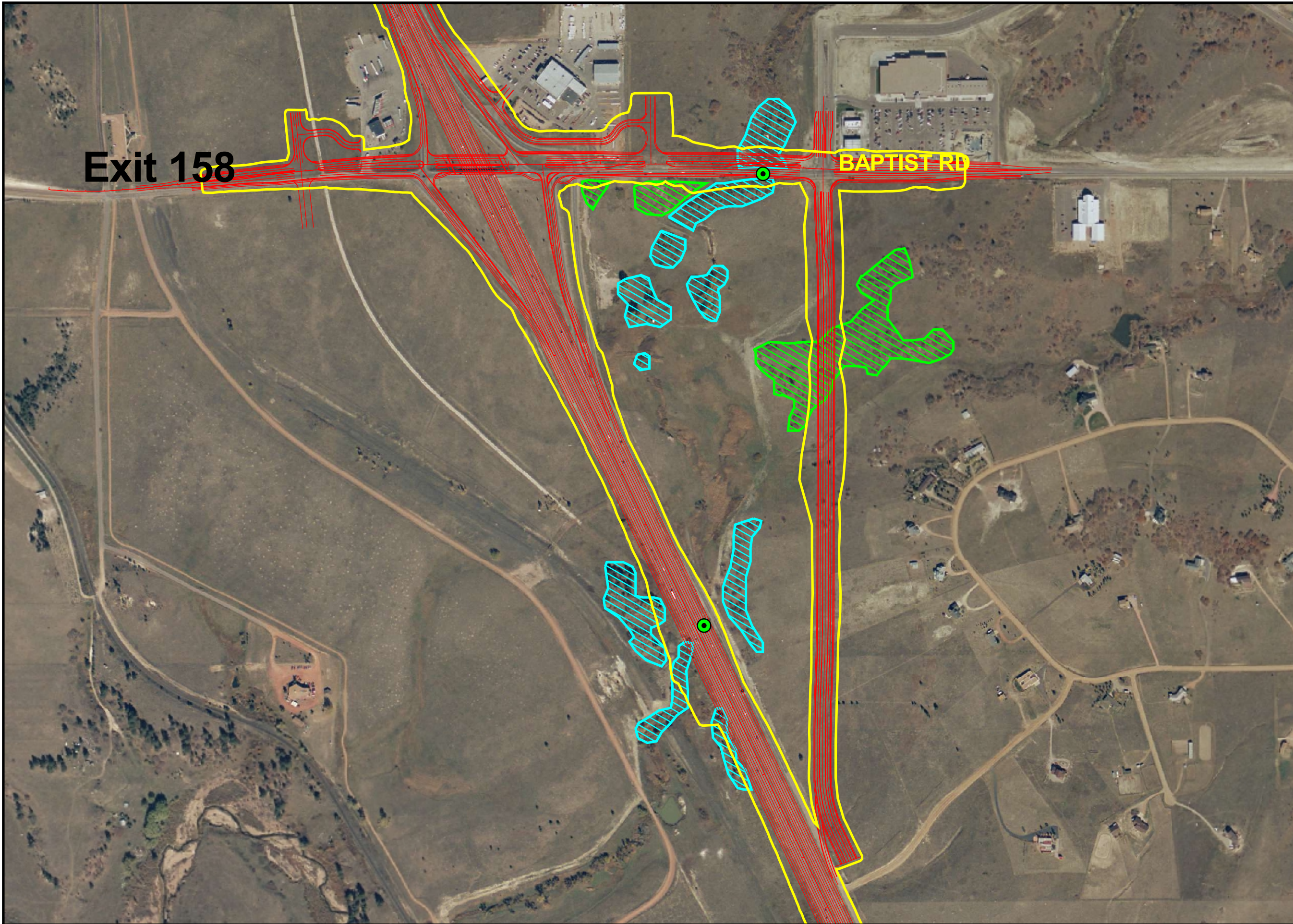


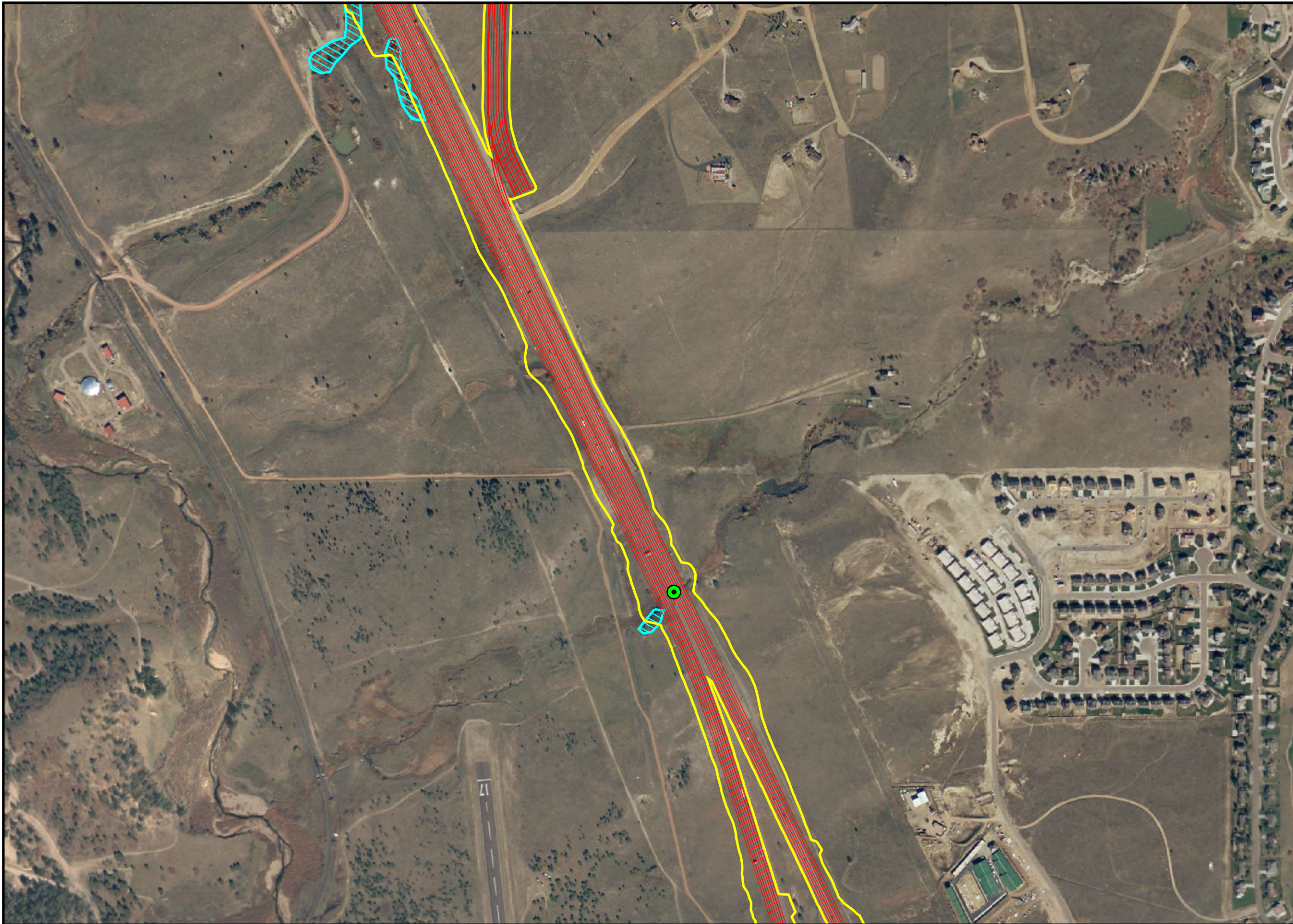
Exit 158

BAPTIST RD

-  Potential Wildlife Movement Corridor
-  Limit of Disturbance 10/30/02
-  Roadway 10/30/02
-  Riparian Deciduous Tree Community
-  Upland Shrub Community
-  Ponderosa Pine Community
-  Mule Deer Concentration Area
-  Prairie Dog Habitat
-  Arkansas Darter

Scale: 1" = 500'

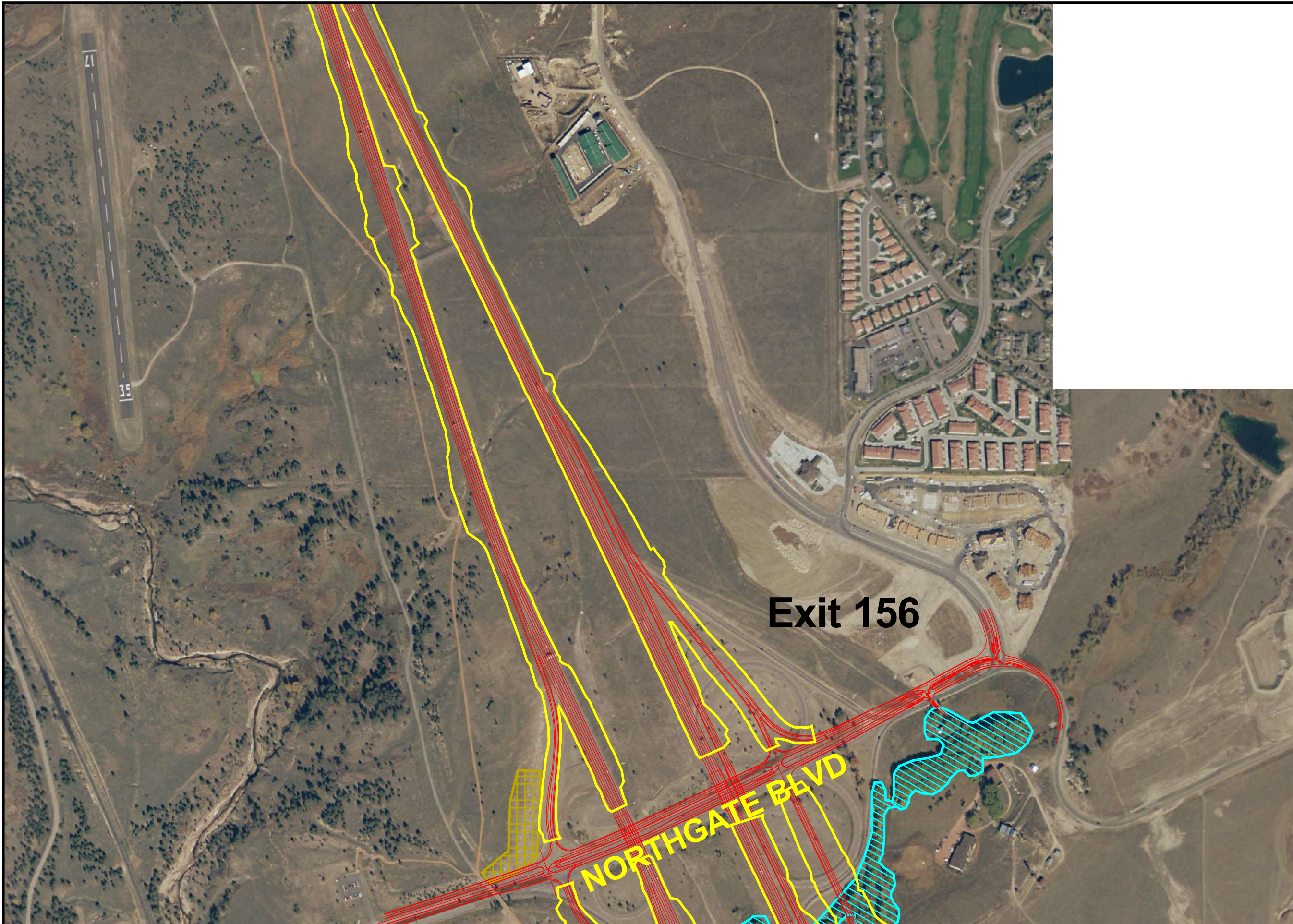




- Potential Wildlife Movement Corridor
- Limit of Disturbance 10/30/02
- Roadway 10/30/02
- Riparian Deciduous Tree Community
- Upland Shrub Community
- Ponderosa Pine Community
- Mule Deer Concentration Area
- Prairie Dog Habitat
- Arkansas Darter

Scale: 1" = 500'

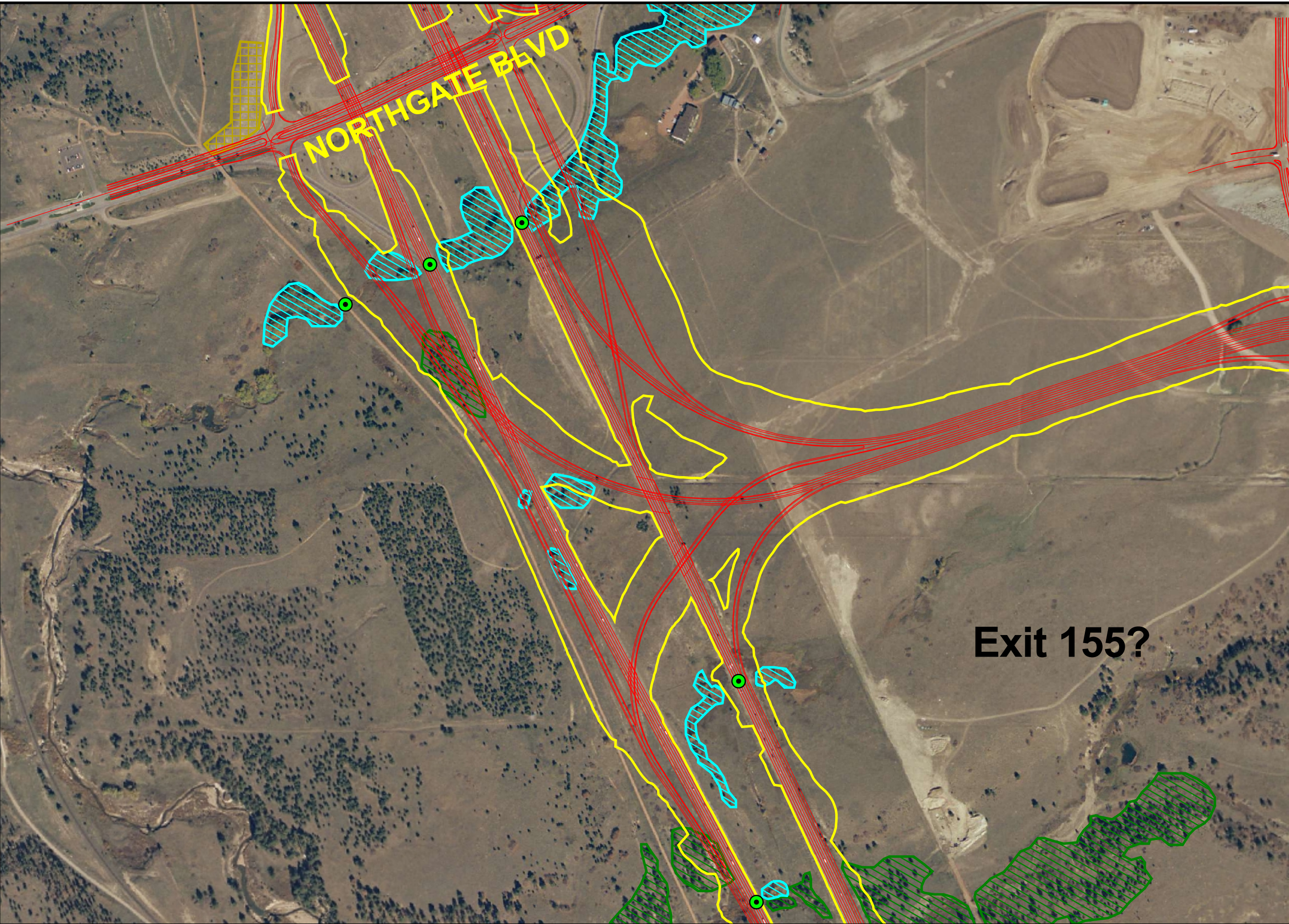




- Potential Wildlife Movement Corridor
- Limit of Disturbance 10/30/02
- Roadway 10/30/02
- Riparian Deciduous Tree Community
- Upland Shrub Community
- Ponderosa Pine Community
- Mule Deer Concentration Area
- Prairie Dog Habitat
- Arkansas Darter

Scale: 1" = 500'





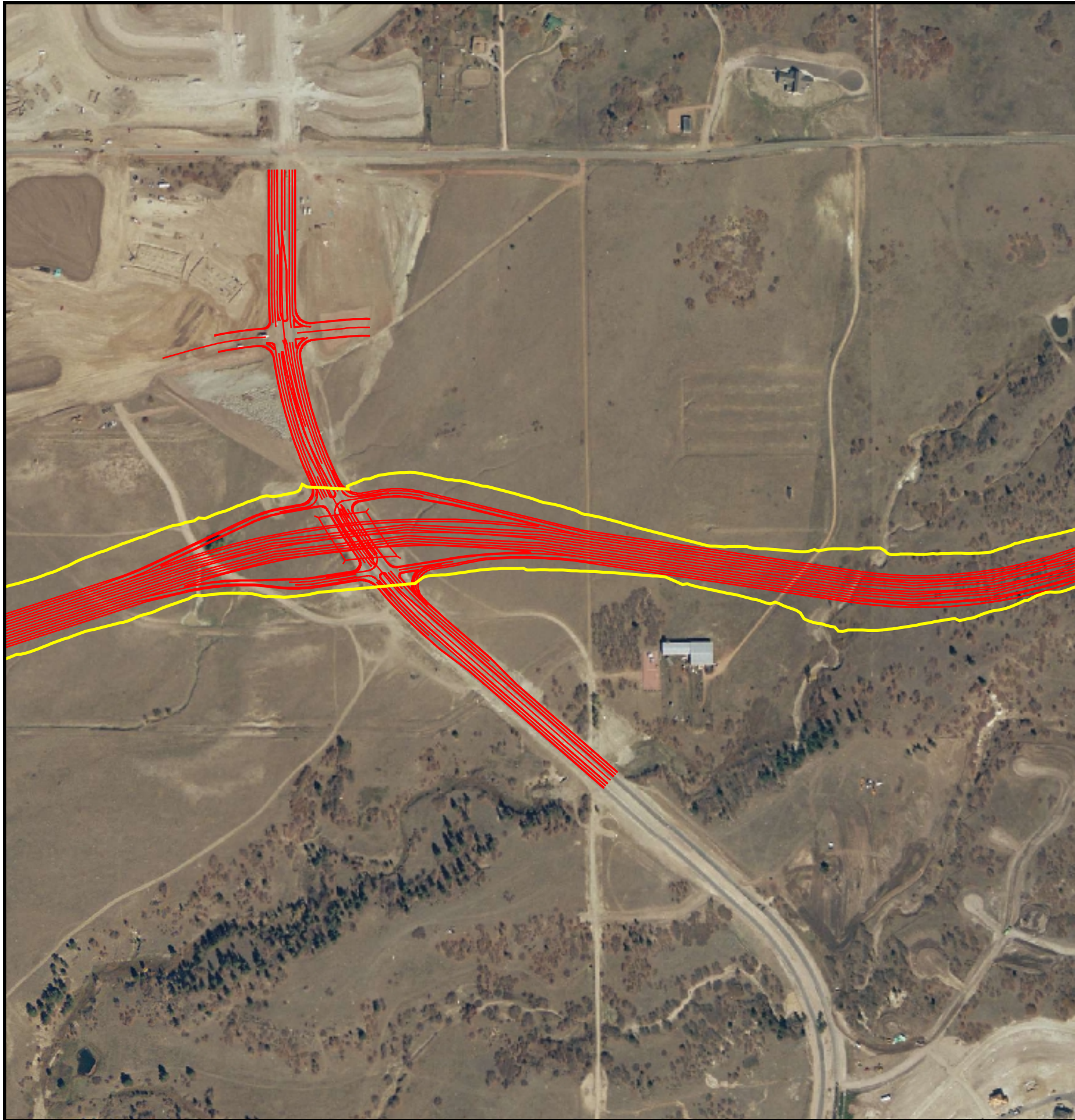
Exit 155?

- Potential Wildlife Movement Corridor
- Limit of Disturbance 10/30/02
- Roadway 10/30/02
- Riparian Deciduous Tree Community
- Upland Shrub Community
- Mule Deer Concentration Area
- Arkansas Darter

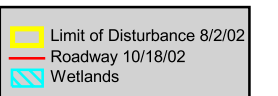
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8A



Note:
No improvements
are proposed east of
Voyager Parkway.

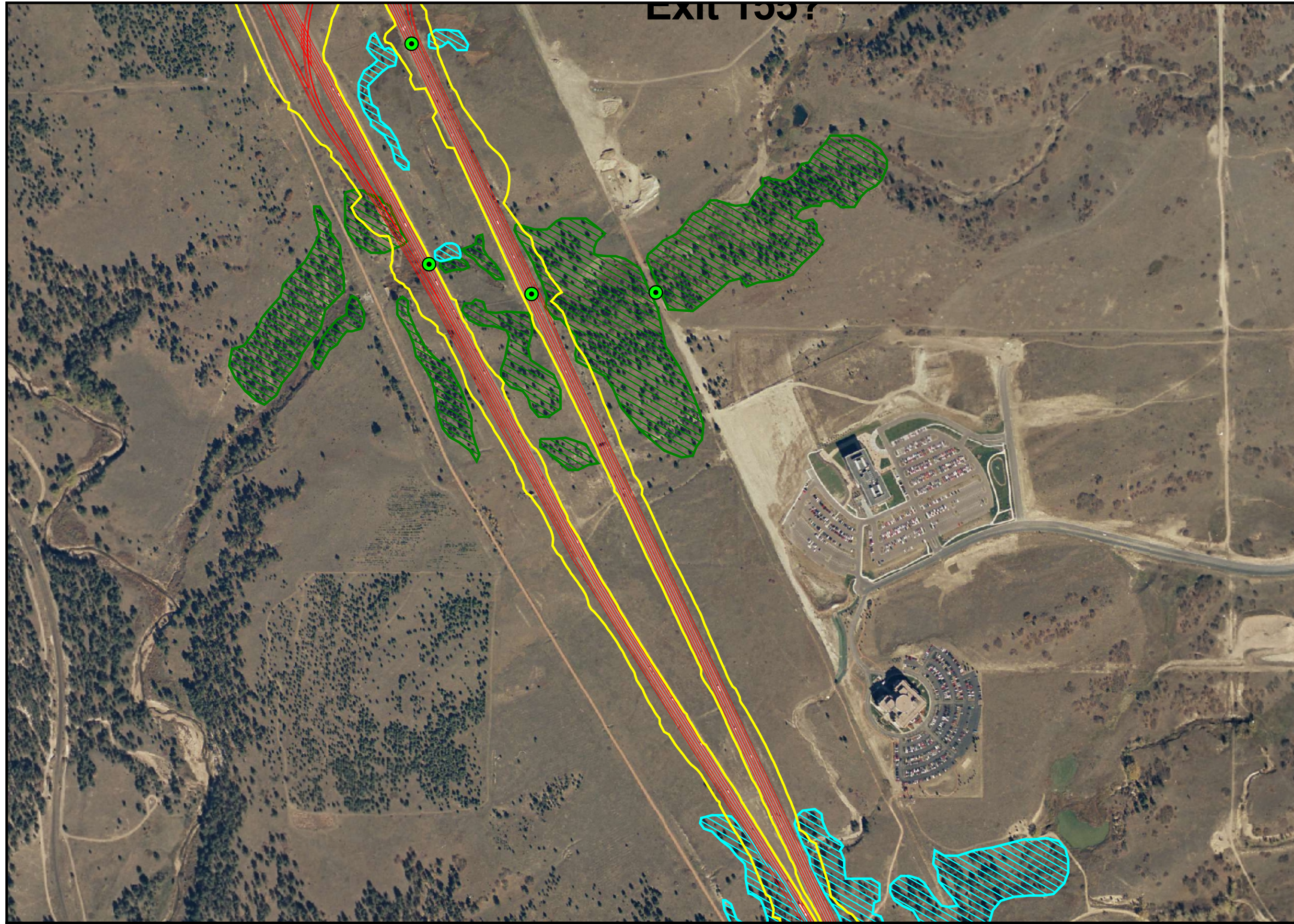


Scale: 1" = 500'



EXIT 155 ?

9

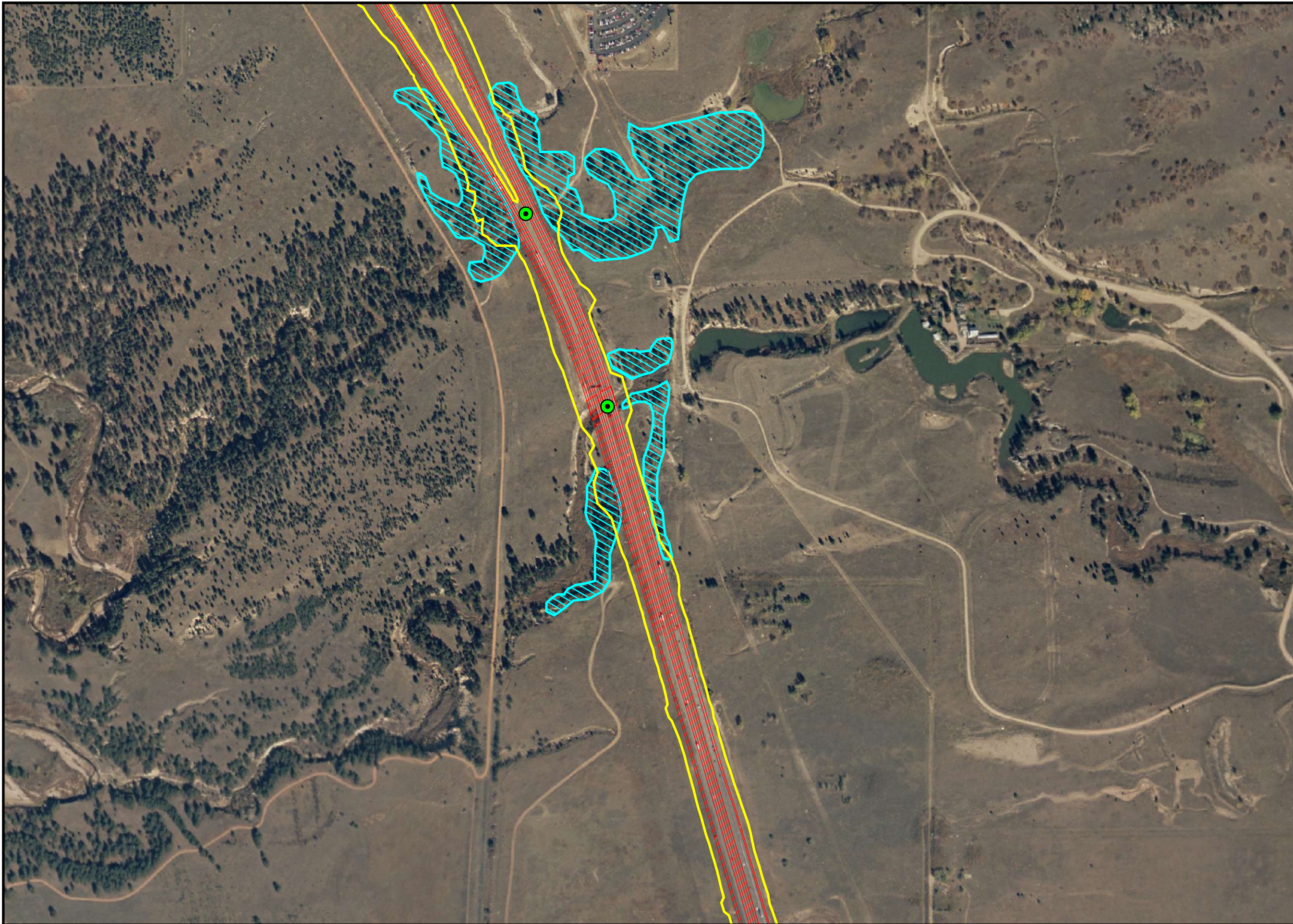


- Potential Wildlife Movement Corridor
- Limit of Disturbance 10/30/02
- Roadway 10/30/02
- Riparian Deciduous Tree Community
- Upland Shrub Community
- Ponderosa Pine Community
- Mule Deer Concentration Area
- Prairie Dog Habitat
- Arkansas Darter

Scale: 1" = 500'



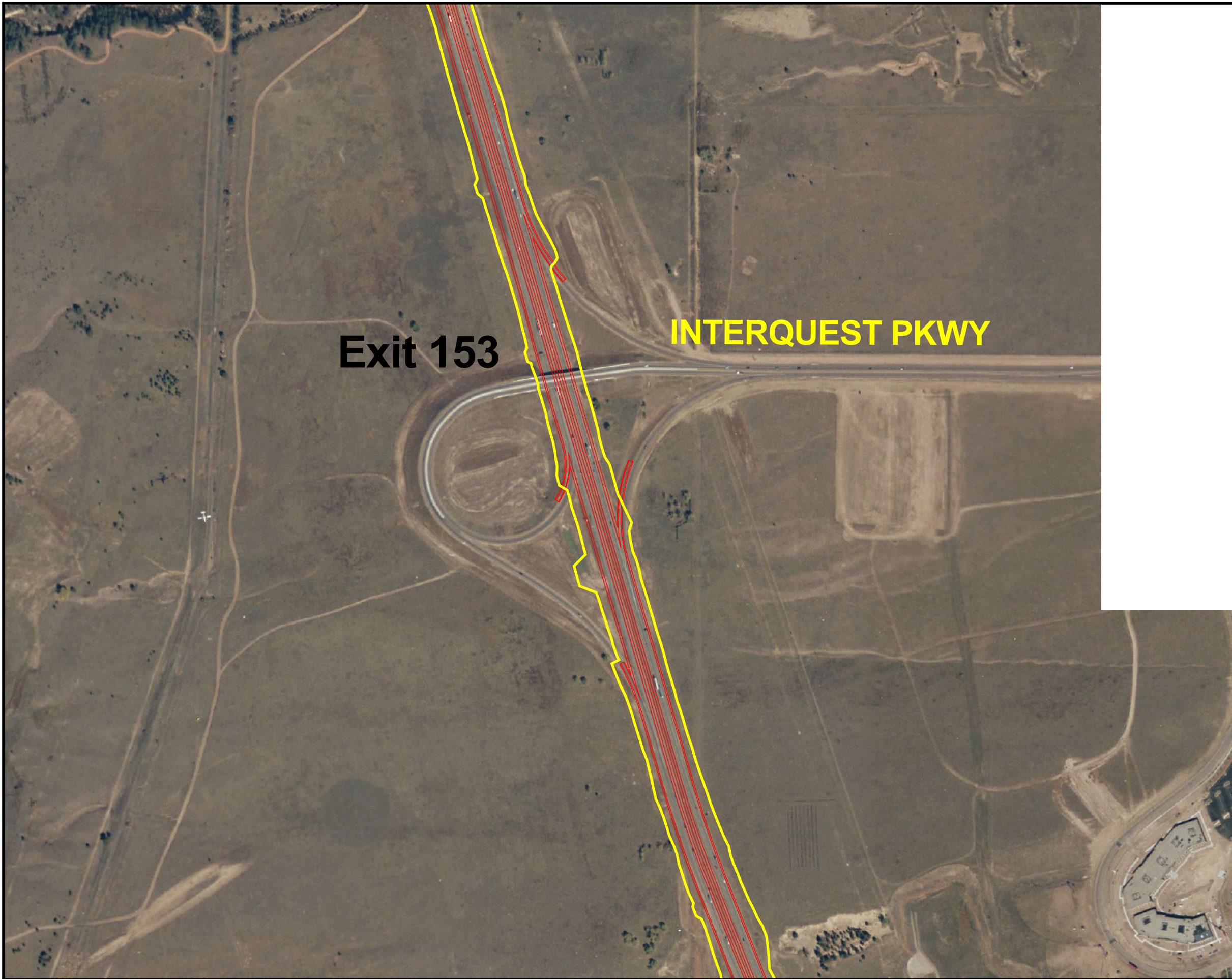
10



- Potential Wildlife Movement Corridor
- Limit of Disturbance 10/30/02
- Roadway 10/30/02
- Riparian Deciduous Tree Community
- Upland Shrub Community
- Ponderosa Pine Community
- Mule Deer Concentration Area
- Prairie Dog Habitat
- Arkansas Darter

Scale: 1" = 500'





Scale: 1" = 500'






- Potential Wildlife Movement Corridor
- Limit of Disturbance 10/30/02
- Roadway 10/30/02
- Riparian Deciduous Tree Community
- Upland Shrub Community
- Ponderosa Pine Community
- Mule Deer Concentration Area
- Prairie Dog Habitat
- Arkansas Darter

Scale: 1" = 500'



Exit 151







-  Potential Wildlife Movement Corridor
-  Limit of Disturbance 10/30/02
-  Roadway 10/30/02
-  Riparian Deciduous Tree Community
-  Upland Shrub Community
-  Ponderosa Pine Community
-  Mule Deer Concentration Area
-  Prairie Dog Habitat
-  Arkansas Darter

Scale: 1" = 500'



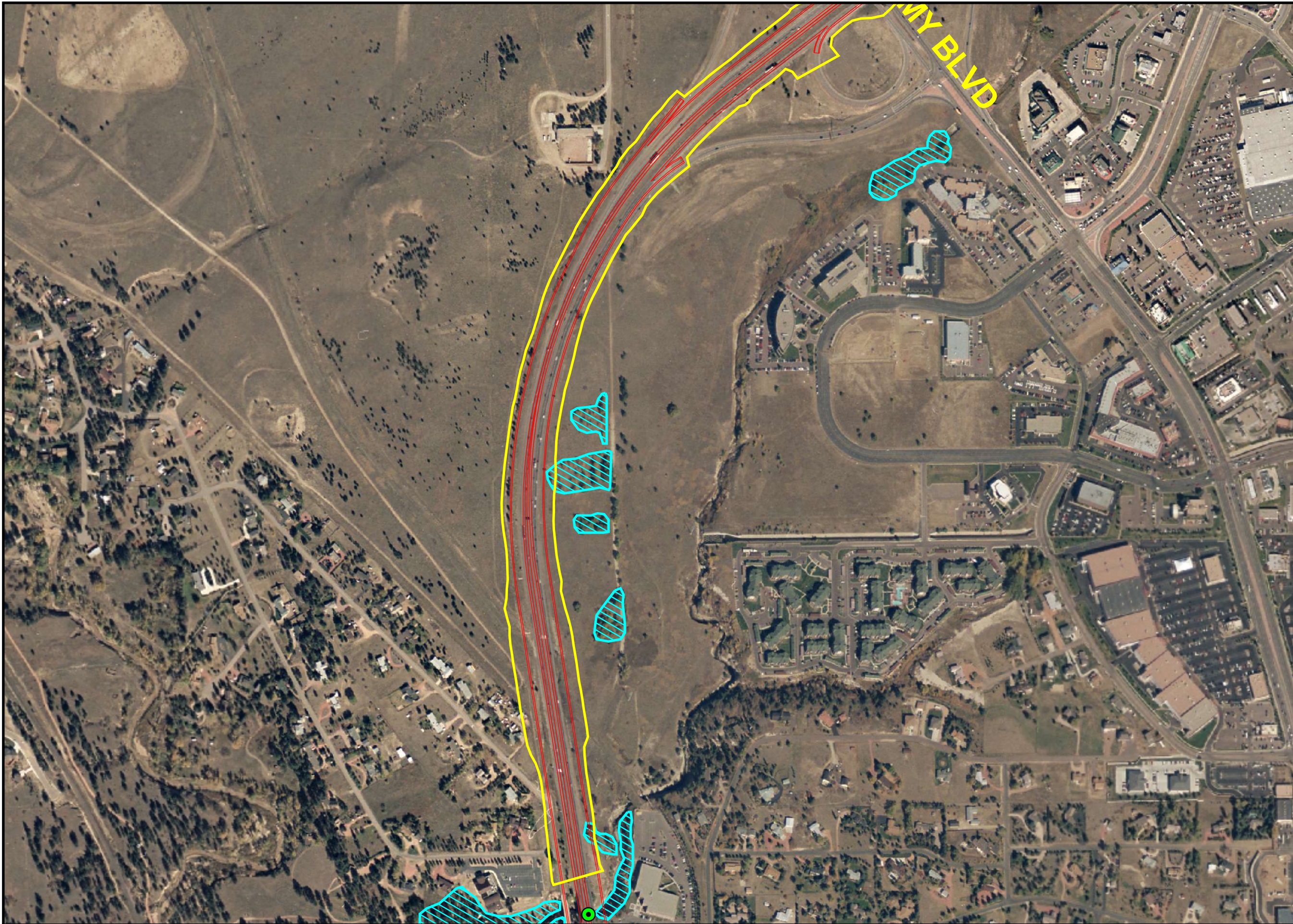
Exit 150

N ACADEMY BLVD

-  Potential Wildlife Movement Corridor
-  Limit of Disturbance 10/30/02
-  Roadway 10/30/02
-  Riparian Deciduous Tree Community
-  Upland Shrub Community
-  Ponderosa Pine Community
-  Mule Deer Concentration Area
-  Prairie Dog Habitat
-  Arkansas Darter

Scale: 1" = 500'

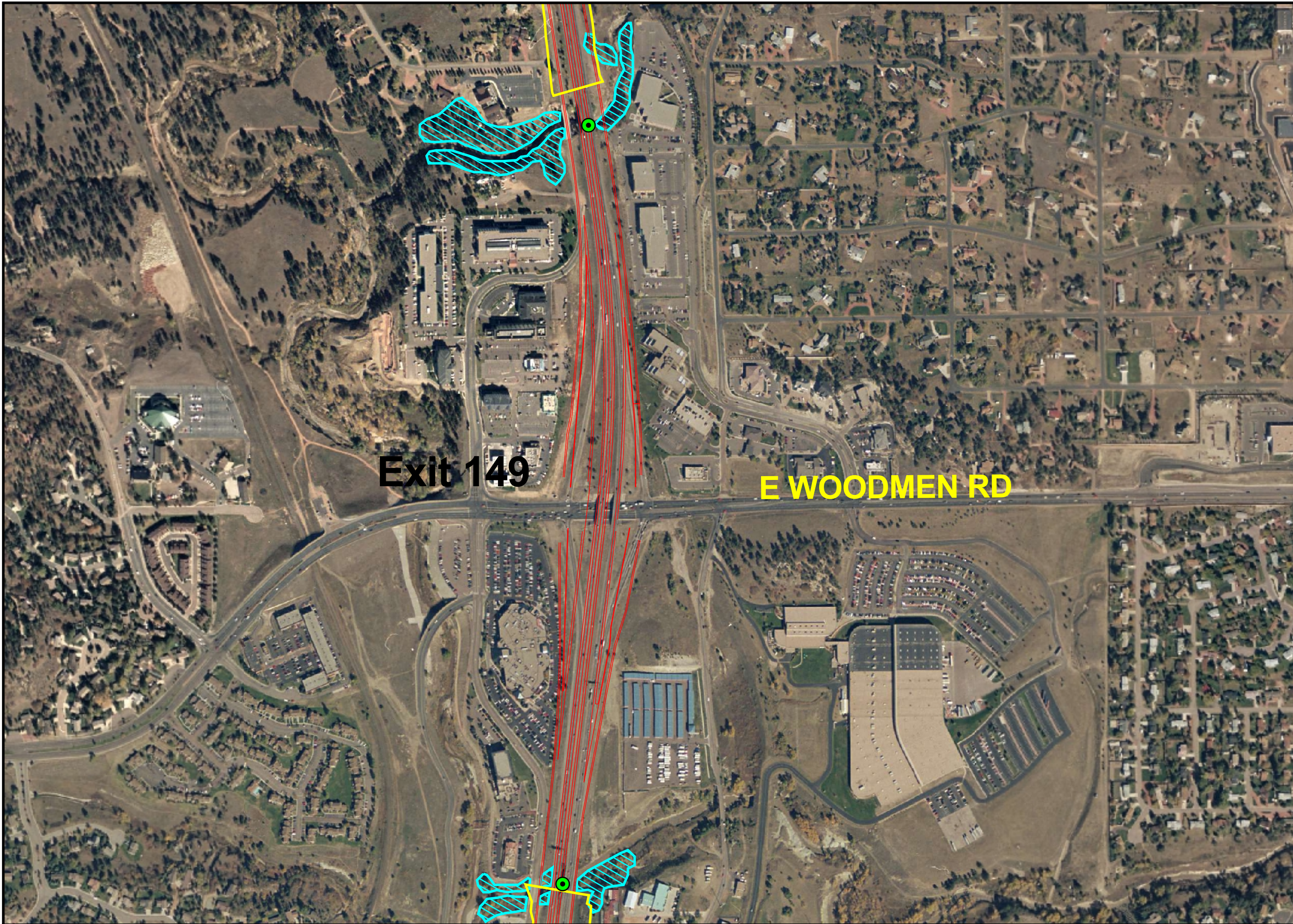




- Potential Wildlife Movement Corridor
- Limit of Disturbance 10/30/02
- Roadway 10/30/02
- Riparian Deciduous Tree Community
- Upland Shrub Community
- Ponderosa Pine Community
- Mule Deer Concentration Area
- Prairie Dog Habitat
- Arkansas Darter

Scale: 1" = 500'





Exit 149








E WOODMEN RD

- Potential Wildlife Movement Corridor
- Limit of Disturbance 10/30/02
- Roadway 10/30/02
- Riparian Deciduous Tree Community
- Upland Shrub Community
- Ponderosa Pine Community
- Mule Deer Concentration Area
- Prairie Dog Habitat
- Arkansas Darter

Scale: 1" = 500'



Cottonwood Creek




-  Potential Wildlife Movement Corridor
-  Limit of Disturbance 10/30/02
-  Roadway 10/30/02
-  Riparian Deciduous Tree Community
-  Upland Shrub Community
-  Ponderosa Pine Community
-  Mule Deer Concentration Area
-  Prairie Dog Habitat
-  Arkansas Darter

Scale: 1" = 500'



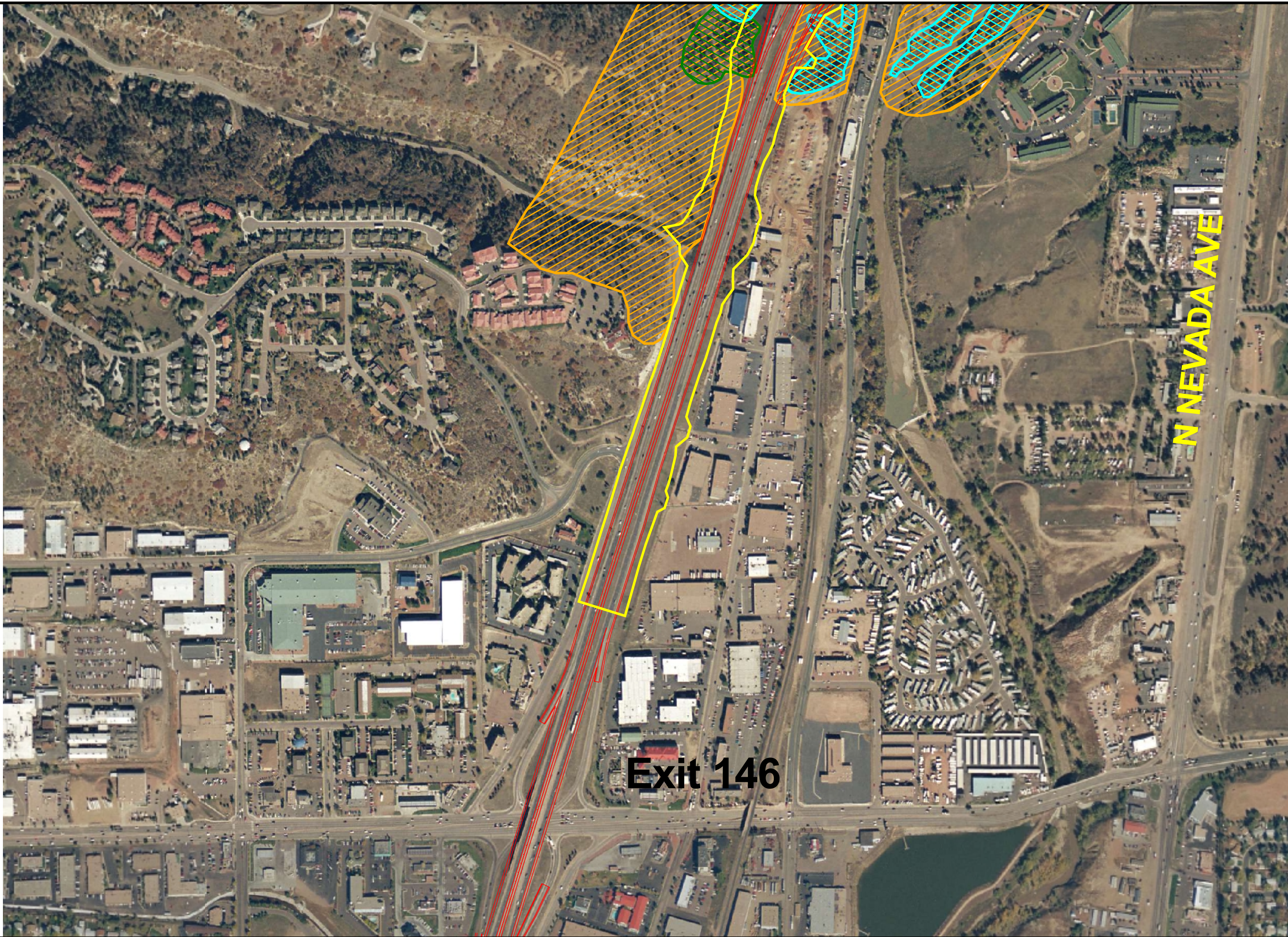
Exit 147

Exit 148

-  Potential Wildlife Movement Corridor
-  Limit of Disturbance 10/30/02
-  Roadway 10/30/02
-  Riparian Deciduous Tree Community
-  Upland Shrub Community
-  Ponderosa Pine Community
-  Mule Deer Concentration Area
-  Prairie Dog Habitat
-  Arkansas Darter

Scale: 1" = 500'





- Potential Wildlife Movement Corridor
- Limit of Disturbance 10/30/02
- Roadway 10/30/02
- Riparian Deciduous Tree Community
- Upland Shrub Community
- Mule Deer Concentration Area
- Prairie Dog Habitat
- Arkansas Darter

Scale: 1" = 500'



GARDEN OF THE GODS RD

Exit 146

20



- Potential Wildlife Movement Corridor
- Limit of Disturbance 10/30/02
- Roadway 10/30/02
- Riparian Deciduous Tree Community
- Upland Shrub Community
- Ponderosa Pine Community
- Mule Deer Concentration Area
- Prairie Dog Habitat
- Arkansas Darter









Scale: 1" = 500'



CENTENNIAL BLVD

Exit 145


FILLMORE

-  Potential Wildlife Movement Corridor
-  Limit of Disturbance 10/30/02
-  Roadway 10/30/02
-  Riparian Deciduous Tree Community
-  Upland Shrub Community
-  Ponderosa Pine Community
-  Mule Deer Concentration Area
-  Prairie Dog Habitat
-  Arkansas Darter

Scale: 1" = 500'





-  Potential Wildlife Movement Corridor
-  Limit of Disturbance 10/30/02
-  Roadway 10/30/02
-  Riparian Deciduous Tree Community
-  Upland Shrub Community
-  Ponderosa Pine Community
-  Mule Deer Concentration Area
-  Prairie Dog Habitat
-  Arkansas Darter





Scale: 1" = 500'



FONTANERO ST

Exit 144

Exit 143

-  Potential Wildlife Movement Corridor
-  Limit of Disturbance 10/30/02
-  Roadway 10/30/02
-  Riparian Deciduous Tree Community
-  Upland Shrub Community
-  Ponderosa Pine Community
-  Mule Deer Concentration Area
-  Prairie Dog Habitat
-  Arkansas Darter

Scale: 1" = 500'



Exit 143

UINTAH ST

CACHE LA POUUDRE ST

-  Potential Wildlife Movement Corridor
-  Limit of Disturbance 10/30/02
-  Roadway 10/30/02
-  Riparian Deciduous Tree Community
-  Upland Shrub Community
-  Ponderosa Pine Community
-  Mule Deer Concentration Area
-  Prairie Dog Habitat
-  Arkansas Darter

Scale: 1" = 500'





-  Potential Wildlife Movement Corridor
-  Limit of Disturbance 10/30/02
-  Roadway 10/30/02
-  Riparian Deciduous Tree Community
-  Upland Shrub Community
-  Mule Deer Concentration Area
-  Prairie Dog Habitat
-  Arkansas Darter

Scale: 1" = 500'

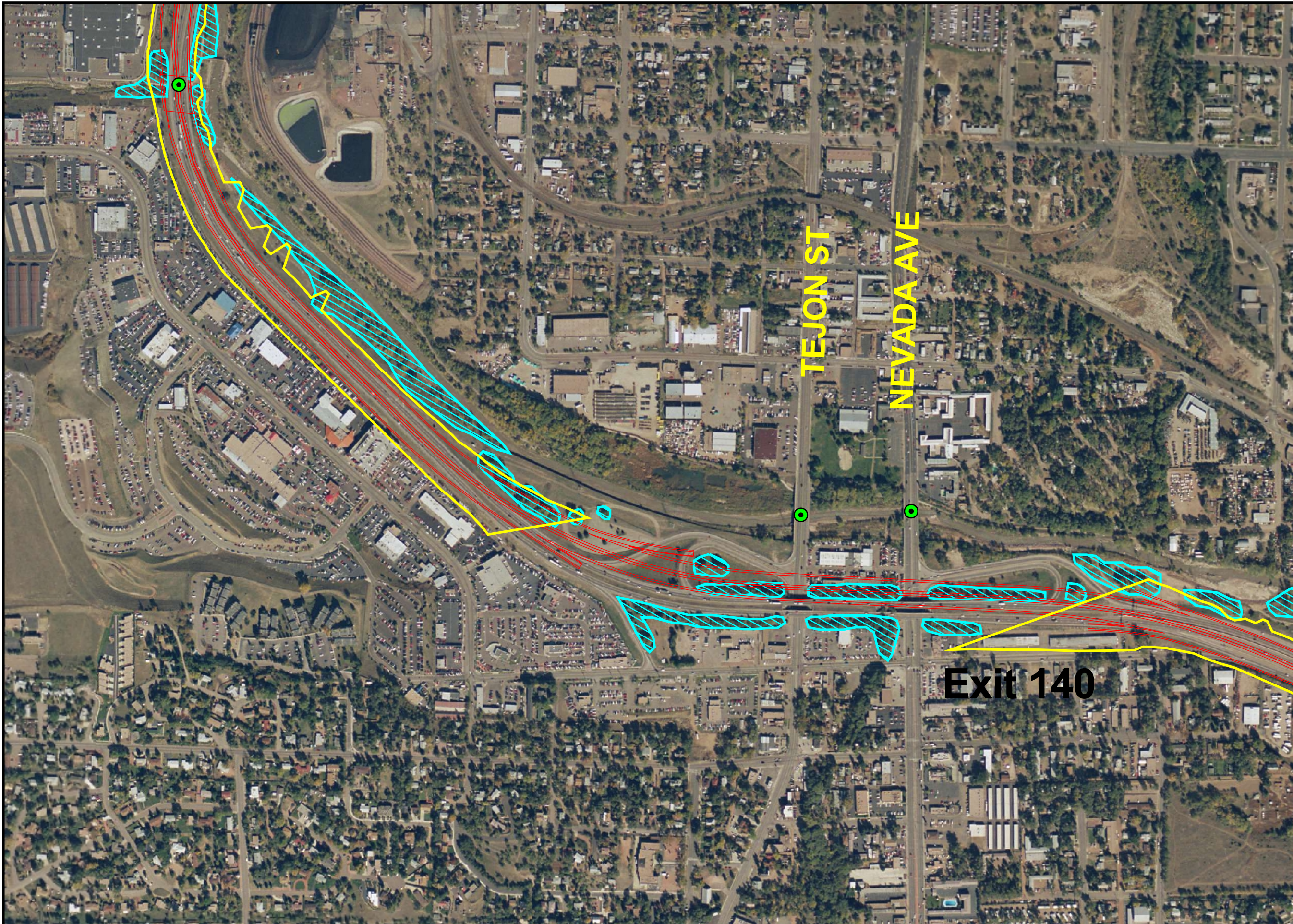




- Potential Wildlife Movement Corridor
- Limit of Disturbance 10/30/02
- Roadway 10/30/02
- Riparian Deciduous Tree Community
- Upland Shrub Community
- Ponderosa Pine Community
- Mule Deer Concentration Area
- Prairie Dog Habitat
- Arkansas Darter

Scale: 1" = 500'













- Potential Wildlife Movement Corridor
- Limit of Disturbance 10/30/02
- Roadway 10/30/02
- Riparian Deciduous Tree Community
- Upland Shrub Community
- Ponderosa Pine Community
- Mule Deer Concentration Area
- Prairie Dog Habitat
- Arkansas Darter

Scale: 1" = 500'



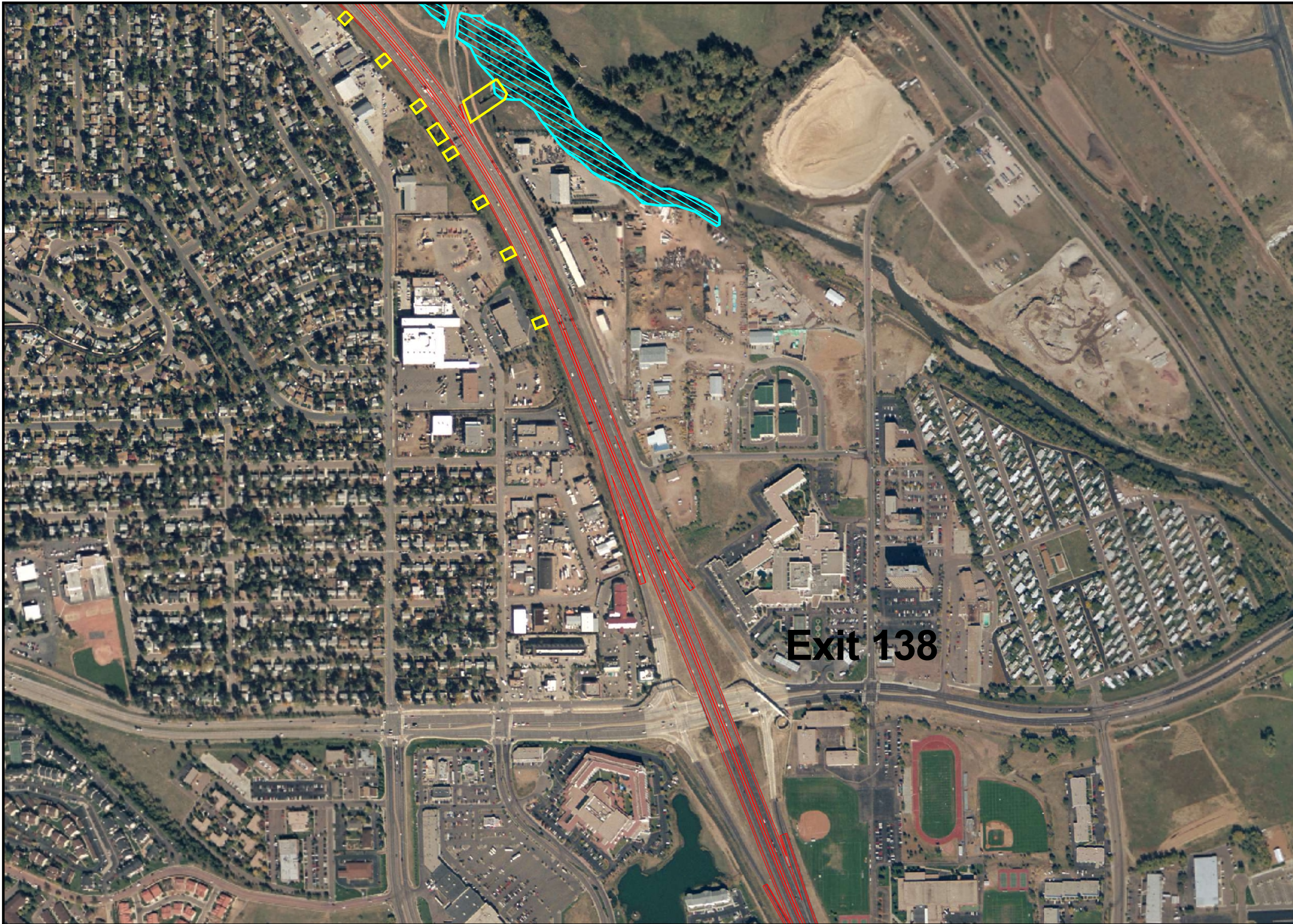
Exit 140

Exit 139

-  Potential Wildlife Movement Corridor
-  Limit of Disturbance 10/30/02
-  Roadway 10/30/02
-  Riparian Deciduous Tree Community
-  Upland Shrub Community
-  Ponderosa Pine Community
-  Mule Deer Concentration Area
-  Prairie Dog Habitat
-  Arkansas Darter

Scale: 1" = 500'






Exit 138

-  Potential Wildlife Movement Corridor
-  Limit of Disturbance 10/30/02
-  Roadway 10/30/02
-  Riparian Deciduous Tree Community
-  Upland Shrub Community
-  Ponderosa Pine Community
-  Mule Deer Concentration Area
-  Prairie Dog Habitat
-  Arkansas Darter

Scale: 1" = 500'

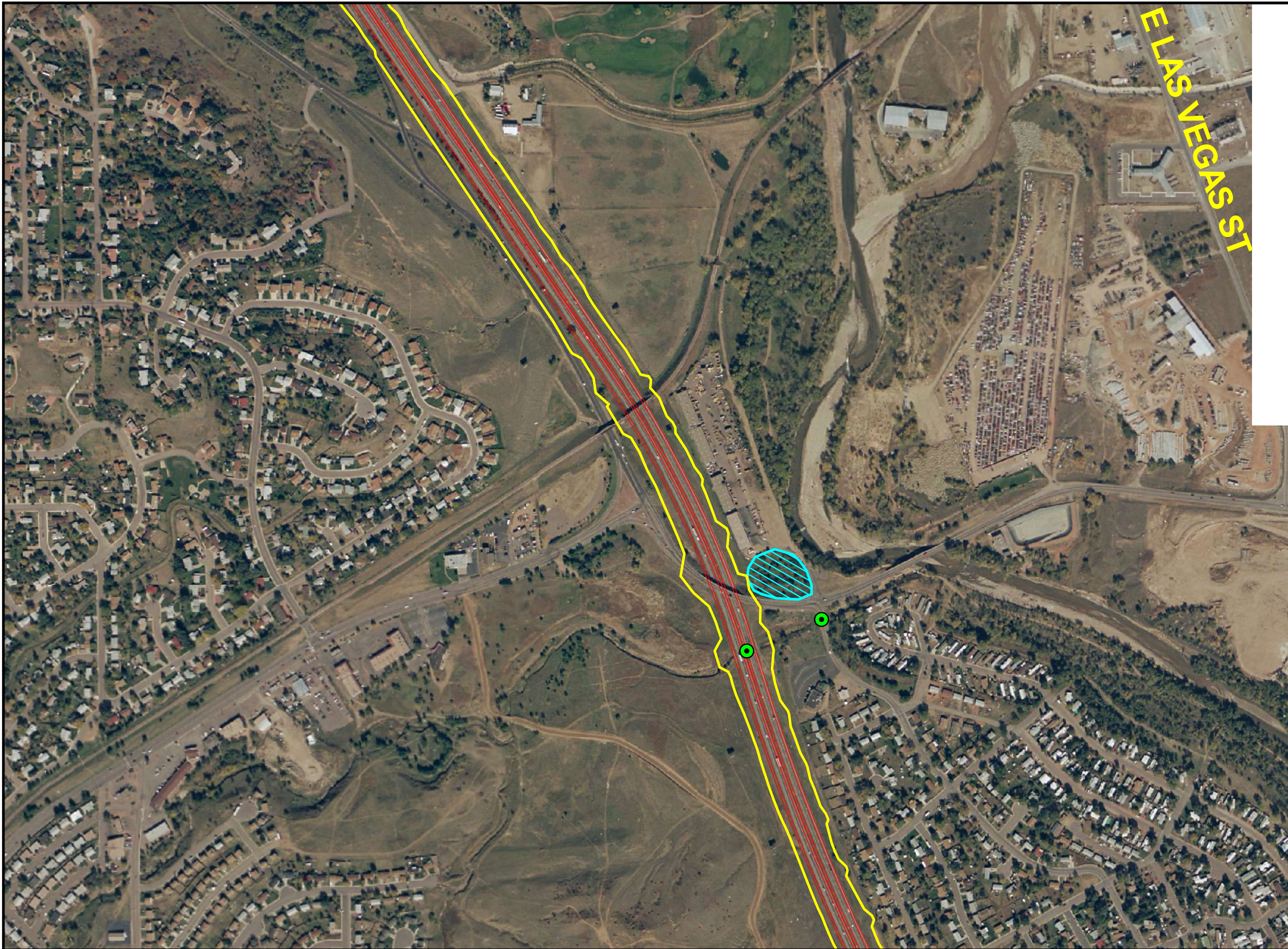




-  Potential Wildlife Movement Corridor
-  Limit of Disturbance 10/30/02
-  Roadway 10/30/02
-  Riparian Deciduous Tree Community
-  Upland Shrub Community
-  Ponderosa Pine Community
-  Mule Deer Concentration Area
-  Prairie Dog Habitat
-  Arkansas Darter

Scale: 1" = 500'





- Potential Wildlife Movement Corridor
- Limit of Disturbance 10/30/02
- Roadway 10/30/02
- Riparian Deciduous Tree Community
- Upland Shrub Community
- Ponderosa Pine Community
- Mule Deer Concentration Area
- Prairie Dog Habitat
- Arkansas Darter

Scale: 1" = 500'

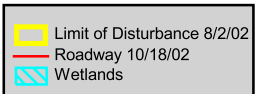


32

Note: No improvements are proposed south of the S. Academy Boulevard interchange.



Note:
No improvements are proposed south of S. Academy Blvd.



Scale: 1" = 500'

