WB I-70 Peak Period Shoulder Lane

BIOLOGICAL ASSESSMENT

October 26, 2018

Categorical Exclusion

BIOLOGICAL ASSESSMENT

WESTBOUND I-70
PEAK PERIOD SHOULDER LANE

Prepared for:

Prepared by:

October 26, 2018

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Acronyms and Abbreviations

ALIVE	A Landscape Level Inventory of Valued Ecosystem Components
CFR	Code of Federal Regulations
CPW	Colorado Parks and Wildlife
CDOT	Colorado Department of Transportation
CNHP	Colorado Natural Heritage Program
CSS	Context Sensitive Solutions
EB	Eastbound
ESA	Endangered Species Act
FHWA	Federal Highway Administration
I-70	Interstate 70
IPaC	Information, Planning, and Conservation
LIZs	Linkage interference zones
MOU	Memorandum of Understanding
MP	milepost
NEPA	National Environmental Policy Act
PEIS	Programmatic Environmental Impact Statement
PPSL	Peak Period Shoulder Lane
ROD	Record of Decision
SH	State Highway
SWEEP	Stream and Wetland Ecological Enhancement Program
US 40	U.S. Highway 40
USDA	United States Department of Agriculture
USEPA	United Stated Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
VMS	Variable Message Sign
WB	Westbound
WVC	wildlife-vehicle collision

Section 1. Purpose of the Biological Assessment

The Federal Highway Administration (FHWA), in cooperation with the Colorado Department of Transportation (CDOT), is preparing a Categorical Exclusion for proposed changes to the westbound (WB) lanes of Interstate 70 (I-70) between approximately milepost (MP) 230 and MP 243, in Clear Creek County, Colorado (Proposed Action). The Proposed Action includes the addition of a 12-mile tolled Peak Period Shoulder Lane (PPSL) between east Idaho Springs and the U.S. Highway 40 (US 40)/I-70 interchange in the WB direction and improvements to the State Highway (SH) 103 interchange. The Proposed Action improves operations and travel time reliability in the WB direction of I-70 in the study area. Additionally, the improvements are consistent with the *I-70 Mountain Corridor Programmatic Environmental Impact Statement* (PEIS; CDOT 2011), PEIS Record of Decision (ROD; FHWA 2011), Context Sensitive Solutions (CSS) on the I-70 Mountain Corridor (CDOT 2009) process, and other commitments of the PEIS and ROD. The Proposed Action fits within the definition of "expanded use of existing transportation infrastructure in and adjacent to the corridor" included in the "Non-Infrastructure Related Components" element within the Preferred Alternative's Minimum Program of Improvements.

This document discusses the regulatory setting, and describes the affected environment and the impacts of the Proposed Action on endangered, threatened, candidate and proposed species within the study area under the Endangered Species Act (ESA) of 1973 (as amended). This document also identifies mitigation measures, including applicable measures identified in the I-70 Mountain Corridor PEIS and ROD, which reduce impacts during construction and operation. Identification of species evaluated in this document comes from the US Fish and Wildlife Service's (USFWS) on-line evaluation tool, the Information, Planning and Conservation System, or IPaC. The site was accessed on December 27, 2017.

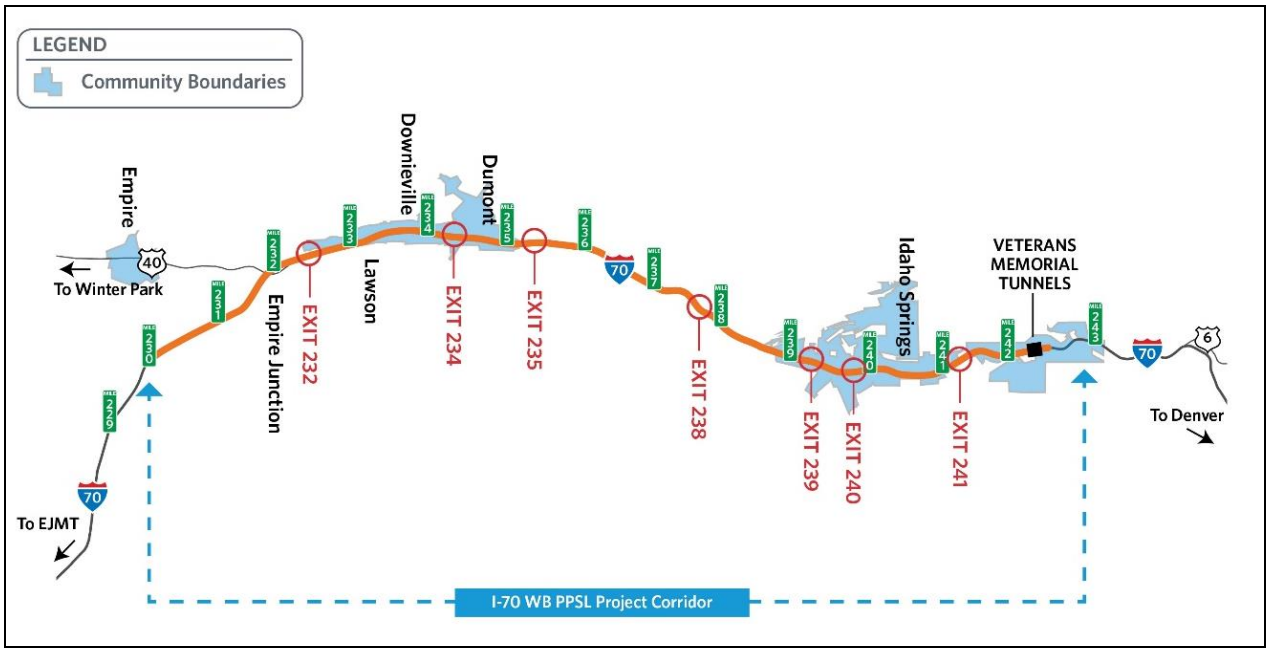
Section 2. Study Area

The study area for the WB PPSL project encompasses CDOT right-of-way along I-70 in both directions from MP 243 to MP 230 and areas immediately adjacent to the right-of-way. This study area was used to evaluate the **direct** effects of the Proposed Action.

For transportation and socioeconomic impacts, the study area for **indirect** effects includes Clear Creek County and the communities of Idaho Springs, Downieville-Lawson-Dumont, and the town of Empire. This area is broadly defined and includes the communities and other areas that would be **indirectly** affected by the Proposed Action. The indirect effects study area includes the communities shown in Figure 1.

For the remaining resources, the study area for **indirect** effects generally includes a 0.25-mile buffer around the study area. This area encompasses the communities and other areas that would be indirectly affected by the Proposed Action.

Figure 1. Study Area Communities



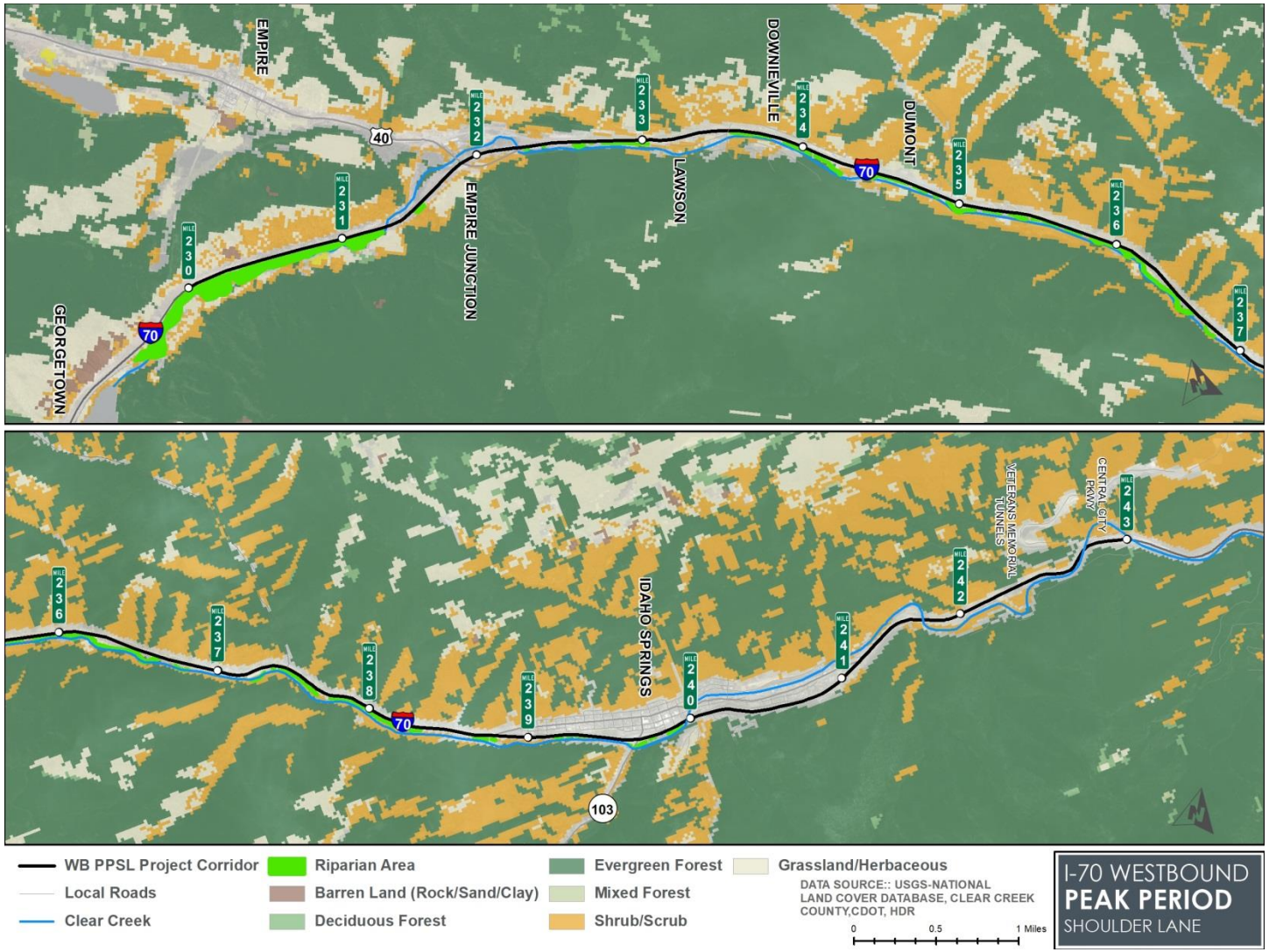
The study area is found on the U.S. Geological Survey 7.5-minute quadrangles: Squaw Pass, Idaho Springs, Central City, Empire, and Georgetown, and has the following coordinates (datum is NAD 83):

- Latitude and longitude:
  - Eastern terminus: Lat 39.7438 Long -105.4826 (Lat 39*44'37.83" N Long 105*28'57.40" W)
  - Western terminus: Lat 39.7588 Long -105.6517 (39*45'31.87" N Long 105*39'.06.14" W)

The study area is located adjacent to Clear Creek, a perennial tributary of the South Platte River. The elevation of the study area ranges from approximately 7,400 feet to 8,250 feet above mean sea level. The study area is primarily located within the montane and foothills zones and the vegetation communities are predominantly evergreen forests and scrub/shrub communities (Figure 2; Chapman, et al. 2006). The montane zone is characterized by open stands of ponderosa pine (*Pinus ponderosa*) at lower elevations and Douglas-fir (*Pseudotsuga menziesii*) forests at higher elevations. Areas north of I-70 are mainly ponderosa pine forest and south of I-70 is mainly Douglas-fir forest.

The foothills zone occurs at lower elevations from 6,000 feet to approximately 8,000 feet and is dominated by ponderosa pine, pinyon-juniper woodlands, deciduous scrublands, and grasslands. Other species that are found in the foothills and montane zones include aspen (*Populus tremuloides*), lodgepole pine (*Pinus contorta*), whortleberry (*Vaccinium myrtillus*), gooseberry currant (*Ribes montigenum*), common juniper (*Juniperus communis*), mountain mahogany (*Cercocarpus montanus*), mountain muhly (*Muhlenbergia montana*), blue grama (*Bouteloua gracilis*), Rocky Mountain juniper (*Juniperus scopulorum*), and a variety of grasses (USEPA 2010).

Figure 2. Vegetation Communities in the Study Area



Grasses and forbs observed in the project study area during the August 2017 surveys included wild strawberry (*Fragaria virginiana*), yarrow (*Achillea millefolium*), Kentucky bluegrass (*Poa pratensis*), common mallow (*Malva parviflora*), common mullein (*Verbascum thapsus*), dandelion (*Taraxacum officinale*), fireweed (*Epilobium angustifolium*), salsify (*Tragopogon dubius*), cinquefoil (*Potentilla* sp.), goldenrod (*Solidago* sp.), white clover (*Trifolium repens*), Rocky Mountain iris (*Iris missouriensis*), vetch (*Astragalus* sp.), wallflower (*Erysimum* sp.), yellow sulfur buckwheat (*Eriogonum umbellatum*), Fendler's meadow-rue (*Thalictrum fendleri*), onion (*Allium* sp.), Scotch thistle (*Onopordum acanthium*), lupine (*Lupinus* sp.), pearly everlasting (*Anaphalis margaritacea*), Canada bluegrass (*Poa compressa*), blue grama , smooth spreading four o'clock (*Mirabilis oxybaphoides*), western wheatgrass (*Pascopyrum smithii*), pineywoods geranium (*Geranium caespitosum*), cliff false goldenaster (*Heterotheca viscida*), pigweed (*Amaranthus retroflexus*), narrowleaf plantain (*Plantago lanceolata*), horehound (*Marrubium vulgare*), catnip (*Nepeta cataria*), field bindweed (*Convolvulus arvensis*), penstemon (*Penstemon* sp.), orchardgrass (*Dactylis glomerata*), and prickly lettuce (*Lactuca serriola*).

The south side of I-70,is characterized by steep, riprap banks and narrow bands of riparian habitat adjacent to Clear Creek. Riparian habitat occurs along Clear Creek in a discontinuous band, and in drainage areas that enter Clear Creek. Narrowleaf cottonwood (*Populus angustifolia*) is the most dominant riparian tree species, with scattered ponderosa pine, Douglas fir, thinleaf alder (*Alnus incana*), river birch (*Betula fontinalis*), sandbar willow (*Salix exigua*), and Engelmann spruce (*Picea engelmannii*). Riparian vegetation observed in the project study area included common sheep sorrel (*Rumex acetosella*), dewystem willow (*Salix irrorata*), willow (*Salix* sp.), field horsetail (*Equisetum arvense*), poison hemlock (*Conium maculatum*), broadleaf plantain (*Plantago major*), stinging nettle (*Urtica dioica*), box elder (*Acer negundo*), and sedge (*Carex* sp.).

The north side of I-70 contains extensive rocky cliff areas sparsely vegetated with juniper, ponderosa pine, Gambel's oak (*Quercus gambelii*), Douglas fir, pinyon pine (*Pinus edulis*), Mescalero currant (*Ribes mescalerium*), and rose (*Rosa* sp.).

The human-created environment in the study area is characterized by highways, roads, towns, single home sites, and recreational developments along Clear Creek. Forest Service-owned lands adjacent to the study area provide recreation opportunities including camping, hiking, cross-country skiing, snowshoeing, fishing, and equestrian activities. I-70 creates a major barrier to wildlife movement in this corridor.

Section 3. Description of the Proposed Action

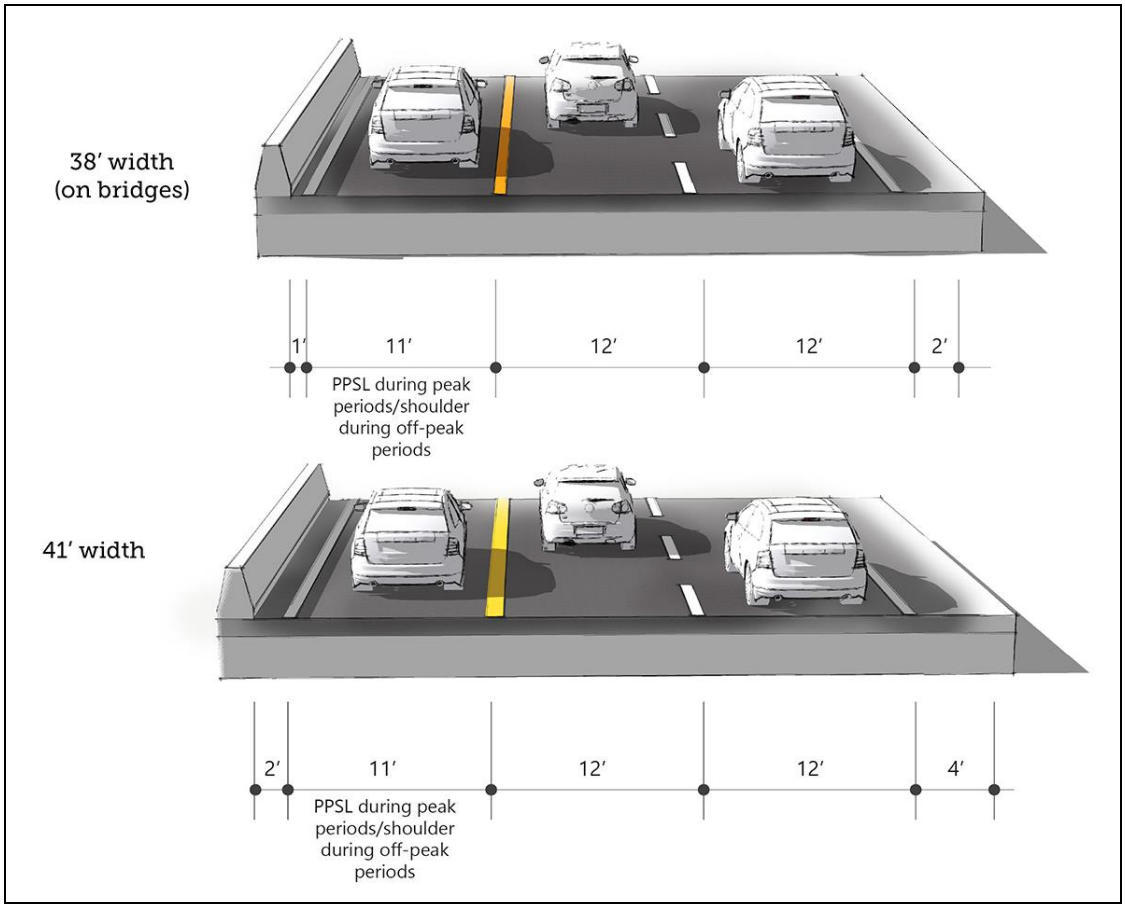
The WB PPSL project adds an approximate 12-mile tolled PPSL on WB I-70 between the Veterans Memorial Tunnels (just west of MP 243) and the US 40/I-70 interchange (MP 232). The lane entrance begins approximately 500 feet east of the Veterans Memorial Tunnels portal. The WB PPSL maximizes the use of the existing alignment and infrastructure in order to minimize any new impacts within the study area. The 11-foot lane is open for use only during peak periods, and otherwise serves as the shoulder of the interstate. Use of the WB PPSL is prohibited for trucks, buses, or any vehicle over 25 feet long. Overhead signs showing the lane status and toll rate are located throughout the corridor and at the entrance point.

An ingress/entrance point for traffic coming onto WB I-70 from Idaho Springs is provided approximately 2,500 feet west of Exit 239. An egress point for traffic exiting to Downieville is provided about 4,400 feet

east of Exit 235, and an egress point for traffic exiting to US 40 is provided approximately 4,400 feet east of Exit 232.

The WB PPSL ends approximately 1/2 mile west of Exit 232. Figure 3 illustrates the typical cross sections of the Proposed Action.

Figure 3. WB PPSL Proposed Action Typical Cross Sections



Source: HDR 2018.

Improvements include:

I-70 Modifications. The general purpose lanes and shoulder of WB I-70 are resurfaced and widened in select locations on the existing alignment between approximately MP 241.5 and MP 232 to accommodate a lane on the shoulder during peak travel periods. Drainage enhancements include a storm system for minor and major storm events and water quality facilities. At SH 103, I-70 is slightly realigned to enhance safety and improve drainage.

SH 103 Interchange Improvements. Ramp improvements address sight distance problems. The pedestrian sidewalk is improved by adding lighting and a decorative paving buffer adjacent to the existing sidewalk on the SH 103 bridge over I-70. This sidewalk connects to a new sidewalk buffered from 13th Avenue between the interchange ramp and Idaho Street in Idaho Springs.

Safety Pull-Outs. A total of seven new safety pull-outs are built—five along WB I-70 and two along EB I-70. One existing safety pull-out on EB I-70 is improved. The intention of these is to provide a space for vehicles to use if they experience a break down and for law enforcement to use.

Rockfall Mitigation. Rockfall mitigation measures are added at five locations to reduce the chance of rocks or other debris from falling on travel lanes or shoulders and reduce the potential for crashes and travel disruptions. Rockfall mitigation measures are included in the WB direction at MP 239, MP 238.4, MP 237.1, and MP 236.4, and in the EB direction at MP 240.3.

Active Traffic Management. Dynamic signage informs drivers so the WB PPSL is appropriately used to reduce congestion. This innovative design improves mobility.

Fiber Optic Upgrades. Fiber optics are designed to accommodate future emerging technologies for autonomous and connected vehicles, improving driver information and emergency response capabilities.

Dumont Port-of-Entry Interchange. Merge area improvements to the Dumont interchange acceleration lane includes restriping of I-70 to reduce merge conflicts between truck traffic and the general-purpose lane traffic.

Dynamic signage

Section 4. Agency Coordination Conducted

As required by Section 7 of the ESA, interagency consultation has been initiated among CDOT, USFWS, and the United States Forest Service (USFS) regarding federally listed and proposed species that could potentially be affected by the proposed project. Based on the USFWS IPaC report (Appendix A) and discussions with the USFWS, the Canada lynx is the only federally listed species with potential to occur in the action area. There is no critical habitat located in the action area.

The agency and public scoping process includes working with the "A Landscape Level Inventory of Valued Ecosystem Components" (ALIVE) Committee to fulfill the commitments set forth in the ALIVE Memorandum of Understanding (MOU), which focuses on wildlife-vehicle collisions (WVCs) and habitat connectivity. The ALIVE Committee was developed during the National Environmental Policy Act (NEPA) process that was completed for the I-70 Mountain Corridor Final PEIS. In 2004 the ALIVE Committee identified 13 areas where the I-70 Mountain Corridor interferes with wildlife migration and wildlife use, including elk (*Cervus canadensis*), mule deer (*Odocoileus hemionus*), Rocky Mountain bighorn sheep (*Ovis canadensis*), and Canada lynx (*Lynx canadensis*). These locations are referred to as linkage interference zones (LIZs). The LIZs suggest areas where wildlife crossing structures and other wildlife-highway mitigation should be focused to reduce WVCs and increase connectivity for wildlife. The MOU, signed in April 2008, details the responsibilities of each agency in addressing a project.

In order to fulfill responsibilities set forth in the ALIVE MOU, the ALIVE Committee scheduled three meetings to discuss wildlife connectivity issues and solicit input on any relevant topics related to the project. The ALIVE meetings were held on August 31, 2017, January 18, 2018, and April 10, 2018. The

ALIVE meetings were attended by representatives from USFWS, CDOT, CPW, USFS, and Clear Creek County. In addition, an environmental scoping meeting was held on June 19, 2017. In addition, an environmental scoping meeting was held on June 19, 2017.

During the August 31, 2017, ALIVE meeting, Alison Michael with USFWS identified Canada lynx as the only federally listed species with potential to occur in the study area.

The Stream and Wetland Ecological Enhancement Program (SWEEP) Issues Task Force meeting for WB PPSL was held on September 11, 2017. The committee identified a number of action items which included data gathering on snow tires, fish populations, and EB PPSL sediment pond status. Other items that were added to the stakeholders' concerns list include potential for spills entering streams, location and management of previously capped mine tailings, and protection of streamside vegetation. The April 10 ALIVE meeting was combined with a meeting of the SWEEP Committee to integrate concerns about sediment ponds acting as wildlife attractants into the siting and design of sediment ponds.

Consultation and coordination efforts conducted to date related to biological resources for this project are listed in Table 1. Meeting minutes are included in Appendix B of this document.

Table 1. Coordination and Consultation Summary

Agency or Committee	Meeting Date	Purpose of Meeting
Environmental Scoping Meeting	June 19, 2017	To present information and solicit input from environmental specialists and resource leads to incorporate into scoping information
SWEEP	September 11, 2017	Provide overview of project and discuss issues relating to water quality, wetlands, and aquatic resources.
ALIVE	August 31, 2017	Provide overview of project and project effects on wildlife with a focus on the Empire Junction LIZ.
ALIVE	January 18, 2018	Achieve consensus on wildlife mitigation solutions for the WB PPSL project.
ALIVE/SWEEP	April 10, 2018	Refine wildlife mitigation solutions and integrate concerns about sediment ponds acting as wildlife attractants into the siting and design of sediment ponds
ALIVE	July 13, 2018	Finalize mitigation recommendations for final design.

4.1 Methodology and Field Studies

Project team biologists from HDR conducted site visits to assess the study area on the following dates:

- August 17, 2017: Sirena Brownlee and Tara Rae Kent
- August 23 and 24, 2017: Tara Rae Kent and Ryan Hammons
- November 15, 2017: Tara Rae Kent and Sirena Brownlee

The purpose of the site visits was to assess the action area for the presence and suitability of potential habitat for federally listed, threatened, and endangered species, as specified by the USFWS (IPaC System (USFWS 2017a). Habitat preferences and known distribution for listed species were reviewed

prior to conducting surveys. Prior to conducting site visits, HDR staff conducted a desktop review of available sources to identify federally listed species with the potential to occur in the action area.

No species-specific surveys were conducted for federally listed species; however, potential habitat for listed species was evaluated in the action area. In general, a buffer of 0.50 mile on either side of existing and proposed centerlines of the road was surveyed. Forested areas and rocky cliffs adjacent to the project area were scanned with high-powered binoculars to determine if raptor nests were present. Vegetation communities in the project area were noted and dominant plant species were documented for each vegetation community.

4.2 Species Evaluation and Effects Determination

The potential for occurrence of each species was determined based on the categories listed below. Because not all species are accommodated precisely by a given category (i.e., category definitions may be too restrictive), an expanded rationale for each category assignment is provided. Potential for occurrence categories are listed below.

- Known to occur—the species has been documented in the project area by a reliable source.
- May occur—the project area is within the species' documented range, and vegetation communities, and soils resemble those known to be used by the species.
- Unlikely to occur—the project area is within the species' currently documented range; however, vegetation communities, soils, and others do not resemble those known to be used by the species, or the project area is clearly outside the species' currently known range.

Species listed by the USFWS were assigned effect determinations based on three categories of possible effect (USFWS 1998). The effects determinations recommended by USFWS include:

- *May affect, is likely to adversely affect*—the project is likely to adversely affect a species if 1) the species is known to occur in the project area, and 2) project activities would disturb areas or habitat elements known to be used by the species or would directly affect an individual;
- *May affect, is not likely to adversely affect*—the project is not likely to adversely affect a species if 1) the species may occur but its presence has not been documented, and 2) project activities would not result in disturbance to areas or habitat elements known to be used by the species; and
- *No effect*—the project will have no effect on a species if 1) the species is considered unlikely to occur (range, vegetation, and others are inappropriate), and 2) the species or its sign was not observed during surveys of the project area.

Section 5. Action Area

The "action area" includes "all areas to be affected directly or indirectly by the Federal Action and not merely the immediate area involved in the action" (USFWS 1998; 50 CFR § 402.02).

For the purposes of this analysis, the project's action area consists of a 0.50-mile radius from the proposed centerline of the trail because of the potential for noise impacts and visual disturbance from construction activities. All direct and indirect effects are expected to be contained within this distance and within this action area.

Section 6. Species Considered and Evaluated

Federally listed and proposed species considered in this BA include species identified in the USFWS IPaC list of Endangered, Threatened, Candidate, and Proposed Species for the project area (Appendix A; USFWS 2017a). Species with no potential for occurrence and no suitable habitat do not require further analysis in this BA. Table 2 documents the listed species and habitat requirements. Based on habitat requirements and discussions with USFWS biologists, the Canada lynx is the only federally listed species with potential to occur in the action area. Impacts to the Canada lynx are discussed in the subsequent sections of this BA. No critical habitat for any federally listed species occurs in the study area. No further evaluation is deemed necessary for those species not known or suspected to occur within the study area.

The Platte River species listed in Table 2 do not occur in the action area but are included because of the potential indirect effects that may occur from water utilization during construction (Section 6.1).

Table 2. Federal-Listed Species and their Potential to Occur in the Action Area

Species	Status[1]	Habitat Requirements	Potential for Occurrence in the Study Area
Birds			
Least Tern* (*Sterna antillarum*)	FE	Reservoirs, lakes and rivers with bare, sandy shorelines for nesting and foraging.	Unlikely to occur. No suitable habitat is present in the study area. This species is included because it occurs in the Platte River system of which Clear Creek is part.
Mexican Spotted Owl (*Strix occidentalis lucida*)	FT	Occurs at elevations below 9,100 feet in large steep canyons with exposed cliffs and dense old growth mixed coniferous forests.	Unlikely to occur. Suitable steep canyon habitat does not occur in the project corridor and there are no breeding records for Clear Creek County (Wickersham 2016).
Whooping Crane* (*Grus Americana*)	FE	Mid-river sandbars, wet meadows, and reservoir edges along the Platte River in Nebraska.	Unlikely to occur. No suitable habitat is present in the study area. This species is included because it occurs in the Platte River system of which Clear Creek is part.
Piping Plover* (*Charadrius melodus*)	FT	Reservoirs, lakes and rivers with bare, sandy shorelines with pebbles for nesting and foraging.	Unlikely to occur. No suitable habitat is present in the study area. This species is included because it occurs in the Platte River system of which Clear Creek is part.
Mammals			
Canada Lynx (*Lynx canadensis*)	FT	Found primarily within the subalpine and upper montane forests zones typically from 8,000 to 12,000 feet in elevation. Early successional	May occur. Suitable habitat exists adjacent to the study area (Figure 4, pg. 13). See Section 6.2 of this document for a detailed discussion.

Table 2. Federal-Listed Species and their Potential to Occur in the Action Area

Species	Status[1]	Habitat Requirements	Potential for Occurrence in the Study Area
		spruce/fir and lodgepole pine forests used for foraging, mature and old growth spruce/fir and lodgepole pine containing large downed woody debris used for denning. Riparian areas, mixed aspen/conifer, mature spruce/fir, and shrublands to forested lynx habitat also used for foraging.	
North American Wolverine (*Gulo gulo luscus*)	PT	Alpine and arctic tundra, boreal and mountain forests (primarily coniferous).	Unlikely to occur. No suitable habitat in study area.
Fish			
Greenback cutthroat trout (*Ancorhynchus clarki stomias*)	FT	Cold, clear, gravelly headwater streams and mountain lakes which provide an abundant food supply of insects.	Unlikely to occur. No suitable habitat in study area.
Pallid sturgeon* (*Scaphirhynchus albus*)	FE	Inhabits large, silty rivers with a diversity of depths and velocities formed by braided channels, sand bars, sand flats and gravel bars.	Unlikely to occur. No suitable habitat is present in the study area. This species is included because it occurs in the Platte River system of which Clear Creek is part.
Plants			
Western Prairie Fringed Orchid* (*Platanthera praeclara*)	FE	Occurs in mesic to wet unplowed tallgrass prairies and meadows but have also been found in old fields and roadside ditches in Nebraska	Unlikely to occur. No suitable habitat is present in the study area. This species is included because it occurs in the Platte River system of which Clear Creek is part

Source: USFWS 2017a.
*Species potentially impacted by Platte River system water depletions.
[1]Status Codes: PT = Proposed Threatened; FE = Federally Endangered; FT = Federally Threatened

6.1 Species Associated with South Platte River Depletions

Five federally listed species in Table 2 are included because they are associated with the South Platte River Water Related Activities Program and could be impacted by projects that would result in water depletions to its tributary, the South Platte River. These include the Least tern, Pallid sturgeon, Piping plover, Whooping crane, and Western prairie fringed orchid. Clear Creek is a tributary to the South Platte River and the study area is within the South Platte River Basin. Project construction activities could result in water depletions to the South Platte River Basin. Water depletions can occur during certain construction activities that require water use, including compaction, cement mixing, detention ponds, dust control, and dewatering of wetlands and riparian areas. Impacts to these species would be managed

through an existing Programmatic Biological Assessment between CDOT and USFWS that addresses the five species noted above (USFWS 2012b). The water used for this project will be reported to the USFWS at the year's end after completion of the project in accordance with the aforementioned consultation.

6.2 Canada Lynx

The Canada lynx is a medium-sized cat with long legs, large, well-furred paws, short black-tipped tail and prominent ear tufts, and a flared facial ruff. The winter pelage of lynx is dense and gray to silverish in appearance, with the summer pelage more reddish to gray-brown. The lynx's long legs and large feet make it highly adapted for hunting in deep snow. The Canada lynx prefers moist boreal forests that have cold, snowy winters where they hunt snowshoe hares (*Lepus americanus*), their principal prey. Other prey species include small- to medium-sized mammals, birds, fish, and occasionally larger mammals and carrion (USFWS 2017b). Riparian and wetland shrub communities found in valleys, drainages, wet meadows, and moist timberline locations may support important prey resources (Ruediger, et al. 2000).

Primary lynx habitat in the southern Rocky Mountains is located within the subalpine and upper montane forest zones, typically between 8,000 feet and 12,000 feet in elevation. Depending on latitude and moisture gradients, however, the lower range of suitable lynx habitat may begin at lower or higher elevations. At the upper elevations of the subalpine zone, forests are typically dominated by subalpine fir (*Abies* spp.) and Engelmann spruce. As the subalpine transitions to the upper montane zone, spruce-fir forests begin to give way to a predominance of lodgepole pine, aspen, or mixed stands of pine, aspen, and spruce. Englemann spruce may retain dominance on cooler, more mesic mid elevation sites, intermixed with aspen, lodgepole pine, and Douglas fir (Ruediger, et al. 2000).

The lower montane zone is dominated by ponderosa pine and Douglas fir, with pine typically dominating on lower, drier, more exposed sites, and Douglas fir occurring on moister and more sheltered sites. Although the lower montane forest zone is typically lower in elevation than primary lynx habitat, montane forests likely are important as connective habitat where they may facilitate lynx dispersal and movements between blocks of primary lynx habitat, and may provide some foraging opportunities during those movements (Ruediger, et al. 2000).

Lynx habitat in the Southern Rockies is naturally fragmented because of elevation, aspect, and local moisture regimes. The high alpine tundra environments and lower, mostly open valleys typically separate subalpine and upper montane forests. Drier south- and west-facing slopes may also break up the continuity of cooler, mesic high-elevation forests that are believed to constitute primary lynx habitat. In these areas, lynx incorporate the matrix habitat (non-boreal forest habitat elements) into their home ranges and use it for traveling between patches of boreal forest that support high hare densities where most foraging occurs (USFWS 2017b).

Individual lynx maintain large home ranges generally between 12 square miles and 83 square miles. The size of lynx home ranges varies depending on abundance of prey, the animal's gender and age, season, and the density of lynx populations. When densities of snowshoe hares decline, for example, lynx enlarge their home ranges to obtain sufficient amounts of food to survive and reproduce. Lynx also make long distance exploratory movements outside their home ranges (USFWS 2017b).

Lynx are dependent on the snowshoe hare as their primary prey and red squirrel (*Sciurus vulgaris*) when populations of snowshoe hare are low. Live, horizontal, conifer foliage density is an important determinant of snowshoe hare presence and abundance within lynx habitat. This cover may occur in both young structure and multistoried stands with the latter being more important to lynx during the winter period.

Even-aged mature and “dry” lodgepole pine stands characteristically have sparse understory vegetation and are not capable of supporting dense populations of snowshoe hares (Interagency Lynx Biology Team 2013).

Lynx use large woody debris, such as downed logs and windfalls, to provide denning sites with security and thermal cover for kittens. For lynx den sites, the age of the forest stand may not be as important as the amount of downed, woody debris available. Breeding occurs between February and April with births occurring in late May to early June. During periods of hare abundance in the northern taiga, litter size of adult females averages four to five kittens. Litter sizes are typically smaller in lynx populations in the contiguous United States (USFWS 2017b).

Den sites tend to be in mature or old-growth stands with a high density of logs (Ruediger 2000; Ruggiero, et al. 2000). Den sites may be located within older regenerating stands (>20 years since disturbance) or in mature conifer or mixed conifer-deciduous (typically spruce/fir or spruce/birch) forests. In the Southern Rockies Ecosystem, a total of 37 dens were found from 2003 to 2006 (Shenk 2009). All of the dens except one were scattered throughout high elevation areas of Colorado south of I-70. Den sites were located at higher elevations (11,000 feet), on steeper slopes (average 30 degrees), and on more northerly aspects than the other den sites outside of the Southern Rockies Ecosystem. The den sites were typically in Engelmann spruce/subalpine fir forests in areas of extensive downfall of coarse woody debris (Interagency Lynx Biology Team 2013). Suitable denning habitat, especially structurally diverse sites with quality foraging habitats, may be a limiting factor in the Colorado landscape (USFWS 2017b).

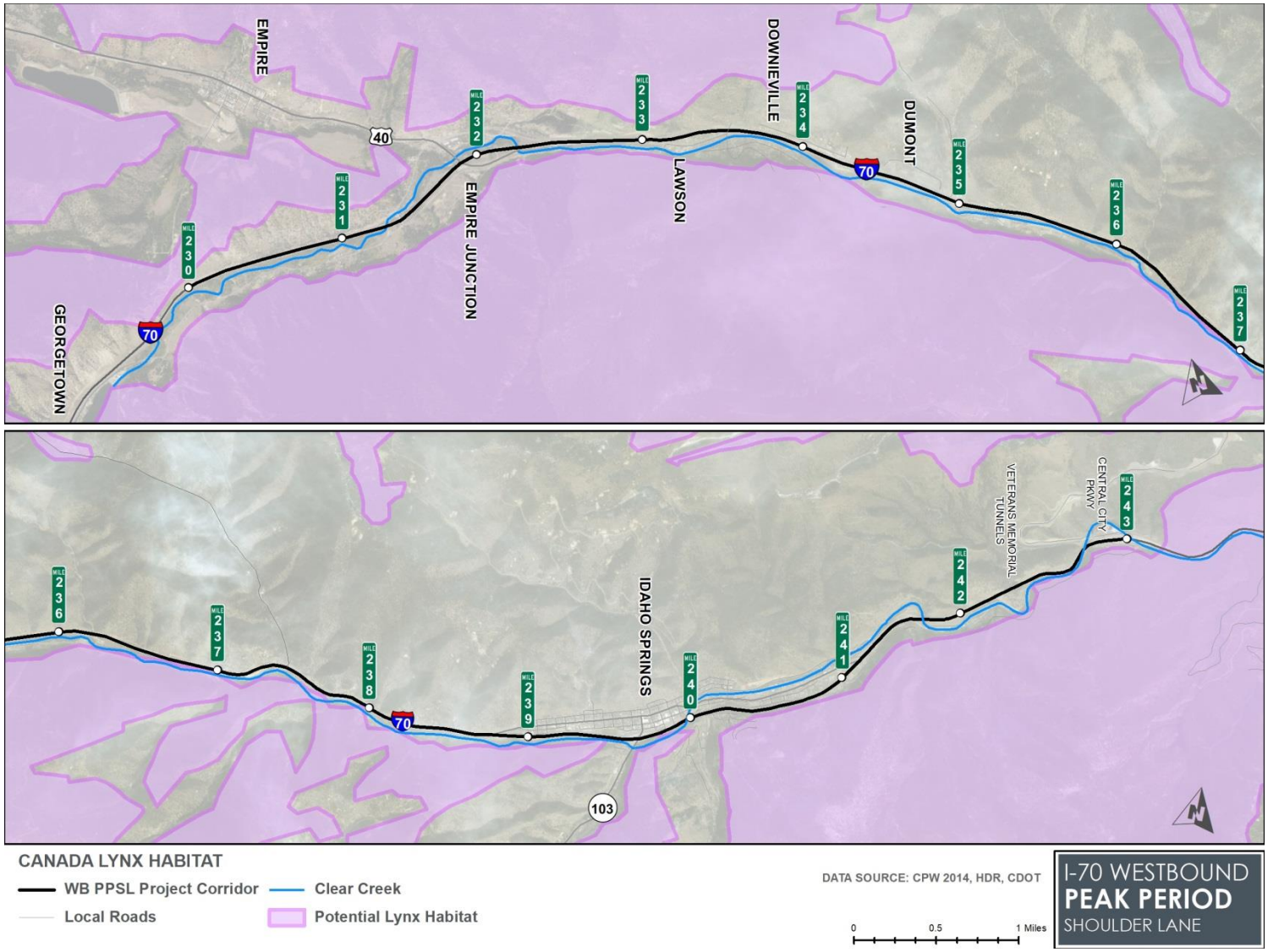
Timber harvest, recreation, and their related activities are the predominant land uses affecting lynx habitat in the contiguous United States. Landscape connectivity between lynx populations and habitats in Canada and the contiguous United States must be maintained. Lynx movements may be negatively affected by high traffic volume on roads that bisect suitable lynx habitat, such as in the Southern Rockies, and in some areas, mortalities because of road kill are high (USFWS 2017). From 1999 to June 2010, there were 122 known mortalities of released adult lynx. Human-caused mortality factors were the highest causes of death with approximately 29.7 percent attributed to collisions with vehicles or gunshot. Starvation and disease/illness accounted for 18.6 percent of the deaths while 37.3 percent of the deaths were from unknown causes (Shenk 2010). No vehicle collisions with lynx have been reported in the study area (CDOT 2016).

Colorado represents the southern-most historical distribution of Canada lynx, where the species occupies the higher elevation montane forests. Lynx were essentially extirpated from the state by the late 1970s, because of unregulated trapping, predator control and habitat incursion (Meaney 2002). CPW initiated a reintroduction program in 1997. From 1999 to 2006, 218 wild-caught lynx from Alaska and Canada were released in southwestern Colorado (Shenk 2009). All releases have been in the San Juan Core Area in southwestern Colorado. Of the transplanted animals, a majority (152 out of 218) remained within the study area in the San Juan Mountains of southern Colorado. Additional small population centers have been established in several locations farther north in Colorado (Shenk 2009).

6.3 Status in the Action Area

CPW has identified suitable lynx habitat north and south of the study area (Figure 4; CPW 2017). Because suitable habitat is above 8,000 feet in elevation, likely occurrences of lynx would be in the study area west of Downieville. Movement of lynx across I-70 west of Empire Junction has been documented

Figure 4. Canada Lynx Habitat



by CPW from reintroduced and Colorado-born lynx using very high frequency telemetry, the Argos satellite system, and snow tracking surveys from 1999 to 2010 (Ivan 2012). The survey identified 80 segments from 29 lynx ($\bar{x}$= 2.8 segments per individual; min= 1, max = 13) that crossed I-70 and had endpoints separated by ≤14 days. These crossings were equally split among males and females (13 males, 16 females) and at least one crossing was documented each year from 1999 to 2010 ($\bar{x}$= 7.7 crossings per year; min = 1, max = 21). Thirty-one (39 percent) of these segments crossed I-70 within a 6.2-mile stretch spanning the east entrance of Eisenhower Johnson Memorial Tunnel to Bakerville. Thirteen (16 percent) additional segments crossed from the east entrance of the tunnel through the Loveland Pass Linkage Zone, and 12 more (15 percent) passed through the Vail Pass Linkage Zone. Most crossings (64 percent) identified via telemetry occurred during summer months. No crossings were documented east of Empire Junction (Ivan 2012).

An analysis of WVC data collected by CDOT does not identify any lynx collisions in the study area. The primary issue affecting lynx in the study area is the interference of I-70 with lynx movement, commonly referred to as the barrier effect.

During the NEPA process completed for the *I-70 Mountain Corridor Final PEIS*, lead agencies examined habitat connectivity and WVCs through the interagency ALIVE committee. Since the release of the Final PEIS, additional data have been compiled and a systematic process was developed to update and refine the 13 LIZs originally delineated in 2004. This updated analysis identified 17 LIZs in the I-70 Mountain Corridor (Kintsch, et al. 2011). Wildlife movement across and adjacent to I-70 is not confined to LIZs. However, these areas are recommended as focal areas for wildlife crossing structures and other improvements to reduce WVCs and improve wildlife passage across I-70.

One LIZ occurs within the study area: LIZ N, Empire Junction, extending 1.4 miles between MP 231.6 and MP 232.9. The target species are Canada lynx, bighorn sheep, elk, mule deer, black bear, and northern leopard frog.

In addition, the Fall River Road LIZ was identified in the original assessment conducted by the ALIVE committee in 2004. This LIZ was not identified in the 2011 update; however, the historical value of this location where the Fall River drainage joins into the Clear Creek drainage should be recognized.

Section 7. Effects of the Action

7.1 Direct and Indirect Effects

This section includes an analysis of the direct and indirect effects of the proposed action. Direct effects are impacts resulting from the proposed action at the same time and in the same place as the action. Indirect effects are those effects that are caused by or could result from the proposed action later in time, but are still reasonably certain to occur.

The majority of project improvements are located within existing highway right-of-way or easements and require minimal vegetative clearing from the right-of-way. Habitat adjacent to the study area has been previously disturbed by past roadway construction activities and development. While the areas north and south of the study area are mapped as potential lynx habitat, much of the study area (generally east of Downieville) is below 8,000 feet and is generally low-quality habitat. Therefore, direct impacts to existing vegetation and lynx habitat in the study area are minor and limited in geographic extent.

Above 8,000 feet, the Proposed Action directly impacts approximately .35 acres shrub scrub habitat because it will be converted to transportation use. However, the habitat that is converted is primarily disturbed roadside habitat that has already been degraded and provides little habitat value to wildlife. Temporary construction impacts include approximately 4.1 acres of disturbed vegetation along the existing road.

I-70 currently poses a substantial barrier to movement for lynx in areas above 8,000 feet in the study area. The roadway between the western side of the Veterans Memorial Tunnels to just west of the US 40 interchange with I-70 is widened typically from 0 to 7 feet to accommodate the managed lane. Just east of the SH 103 interchange, WB I-70 is shifted north away from the median and widened up to 21 feet for a length of 800 linear feet. Some of the medians will also be shifted 4 to 8 feet from their existing location to accommodate the managed lane. This results in a slightly wider paved highway segment than what currently exists. The slight increase in paved highway lengthens the crossing distance for lynx and adds another lane of traffic during operation of shoulder lane. The part time use of the shoulder as a traveled lane increases the barrier effect in the study area during peak periods only and may result in more WVCs in the study area. Lynx are not expected to cross the highway during peak period operations because of the volume of traffic and human activity and because lynx are more active at nighttime. Therefore, the higher speeds and wider roadway results in minor impacts to lynx during operation of the peak period shoulder lane.

Implementation of the Proposed Action requires the use of dynamic signage that employs lighted messages to motorists. Lighted signs have the potential to discourage individual lynx from attempting to cross the highway, resulting in an increase of the barrier effect of I-70 in the study area. The signs most likely to overlap with lynx habitat are located in areas over 8,000 feet in elevation (MP 230 to MP 234). The Proposed Action results in a maximum of 3 signs above 8,000 feet. The signs are electrified and displaying a message at all times. There is one variable message sign and 2 green arrow signs. No additional external lighting is required on these signs. The addition of electronic signs in the study area results in a moderate, but geographically limited, effect to lynx.

7.2 Construction Activity Effects

Construction activities result in temporary affects to lynx in the vicinity of the study area for the duration of construction (April 2019 through December 2020) because of disturbance from construction noise and equipment and increased human presence. Although temporary disturbance from construction activities may occur, the effect is expected to be minor and temporary and limited to the area west of Downieville. Lynx are expected to avoid the area during construction due to the increased noise and human presence, but their “normal” behavior is expected to return shortly after the completion of the project.

Construction noise in the proposed project location would occur on a temporary, intermittent, and localized basis from April 2019 through December 2020. Lynx that occur in the area west of Downieville are acclimated to the regular sound of cars passing on I-70 and in general there would be no discernable difference in noise levels from construction equipment and vehicles beyond 500 feet from the roadway based on noise attenuation rates.

Construction activities will occur mostly during daylight hours, reducing the potential for direct disturbance to lynx during nighttime when lynx are more active. Some nighttime work may be necessary; therefore, lynx conservation measures have been included to reduce the potential for disturbance to lynx during nighttime work (Section 8). The likelihood of an adult lynx being killed by construction traffic is

discountable because of only partly overlapping activity periods, the presumed low number of lynx present in the action area, and the slow speeds of construction vehicles traveling on the road.

7.3 Cumulative Effects

Under the ESA, cumulative effects are defined as the incremental impact of the action when added to other past and ongoing federal actions and past, present and reasonably foreseeable future non-federal actions.

A primary factor affecting lynx in the study area will be increased traffic growth on I-70, as Colorado's population continues to grow and additional Front Range residents use I-70 to access summer and winter recreational opportunities in the mountains. The PEIS indicated that traffic volumes throughout the entire I-70 Mountain Corridor are expected to increase 29 to 43 percent by the year 2035. High traffic volumes can create a barrier to wildlife attempting to cross the roadway, and can result in indirect habitat loss/fragmentation or wildlife injury from vehicular collisions. As the barrier effect of I-70 continues to increase, wildlife populations north and south of I-70 in the study area and beyond are becoming incrementally isolated from one another, precluding genetic interchange between populations. The construction of the Clear Creek Greenway project will likely cause lynx to further avoid the corridor due to human disturbance on the trails.

While the Proposed Action is likely to have only incremental effects on lynx movement, habitat connectivity or WVCs, the cumulative effects of multiple highway improvement projects in the vicinity, increasing traffic volumes, concurrent residential and commercial development, adjacent roads and fencing, recreation trails, and increasing human activity throughout the study area results in substantial effects to lynx habitat, lynx movements and lynx mortality over both space and time.

CDOT works closely with the USFS and CPW as projects are developed to make sure the appropriate mitigation is undertaken to minimize these effects. As future development is proposed along this corridor, CDOT and local jurisdictions will continue to address the cumulative effects of development on wildlife.

Section 8. Effects Determination

Based on the disturbed location of the project, the minor direct impacts resulting from the project, and the conservation measures proposed, CDOT has determined that the project *may affect, but is not likely to adversely affect* the Canada lynx. Temporary noise and increased human activity could cause lynx to avoid habitat adjacent to the action area during construction but this would be temporary, intermittent and localized. Minor vegetation clearing will remove disturbed roadside habitat that has already been degraded and provides little habitat value to lynx or lynx prey. No critical habitat has been designated in Colorado; therefore, none will be affected.

The project is expected to have no effect on any other federally designated species other than those impacted by water depletions from the South Platte River Basin which are being addressed through the South Platte River Depletion Biological Assessment and Biological Opinion.

FHWA and CDOT would like to request a written concurrence from the USFWS on these findings.

Section 9. Conservation Measures Proposed

9.1 Mitigation

To minimize impacts to the Canada lynx, CDOT proposes the conservation measures contained in Table 3.

Table 3. Mitigation Tracking

Mitigation Category	Impact from NEPA Document	Commitment From Mitigation Table In Source Document (Use Exact Wording from Table in Source Document)	Responsible Branch	Timing/Phase of Construction Mitigation to be Constructed
Threatened and Endangered Species	Platte River species could be impacted by water depletions in tributaries such as Clear Creek.	Mitigation for impacts caused by water depletions on federally listed species will be addressed by FHWA and CDOT participation in the Platte River Recovery Implementation Program and South Platte Water Related Activities Program. Water used for this project will be reported to the USFWS at the completion of the project.	CDOT Environmental	Post-Construction
Threatened and Endangered Species	Temporary disturbance or displacement of lynx above 8,000 feet	The project Engineer shall immediately report to the CDOT Biologist any lynx sightings within or adjacent to the proposed project area during construction. Coordination with the USFWS will be conducted within 24 hours and a temporary work stoppage may be required, per USFWS direction.	CDOT Environmental	During Construction
Threatened and Endangered Species	Temporary disturbance or displacement of lynx during nighttime work	Night work will be limited to a maximum of 4 consecutive nights followed by three nights of inactivity to allow lynx the opportunity to cross the highway. Night work restrictions will only occur at elevations above 8,000 feet (MP 230-MP 243). Nighttime construction will be geographically concentrated in order to allow lynx the opportunity to cross the highway in other locations.	CDOT Environmental	During Construction
Raptors and Migratory Birds	Construction related disturbance between April 1 and August 31. Potential loss of eggs or young of nesting migratory birds and/or raptors	If construction is to commence between February 1 and August 31, to avoid impacts to nesting birds in accordance with the Migratory Bird Treaty Act, a qualified biologist will conduct a nest survey prior to construction. If active nests are found, coordination with CPW and USFWS is required to determine an appropriate course of action, which may include, but is not limited to, a delay in construction to avoid the breeding season.	CDOT Environmental	Pre-Construction

Table 3. Mitigation Tracking

Mitigation Category	Impact from NEPA Document	Commitment From Mitigation Table In Source Document (Use Exact Wording from Table in Source Document)	Responsible Branch	Timing/Phase of Construction Mitigation to be Constructed
Raptors and Migratory Birds	Construction related disturbance to raptors that could result in potential loss of eggs or young of nesting raptors	A pre-construction survey for nesting raptors will be completed within a half-mile buffer of the project area prior to construction. If any nesting raptors occur within the buffer area, then CPW "Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors" guidelines will be followed.	CDOT Environmental	Pre-Construction
Vegetation	Vegetation disturbance and ground clearing that creates potential noxious weed issues.	Reseed and protect temporary disturbance areas with CDOT approved Best Management Practices and avoid disturbance to existing vegetation, to the maximum extent possible.	CDOT Environmental	During Construction
Vegetation	Introduction of noxious weeds from vegetation and ground disturbing activities.	An Integrated Noxious Weed Management Plan will be developed during final design and implemented during construction to prevent the spread of noxious weeds into temporary disturbance areas.	CDOT Environmental	During Construction

Section 10. References

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Appendix A.

IPaC

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Colorado Ecological Services Field Office
Denver Federal Center
P.O. Box 25486
Denver, CO 80225-0486
Phone: (303) 236-4773 Fax: (303) 236-4005
http://www.fws.gov/coloradoES
http://www.fws.gov/platteriver

In Reply Refer To: December 27, 2017
Consultation Code: 06E24000-2017-SLI-1229
Event Code: 06E24000-2018-E-00921
Project Name: WB PPSL

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Colorado Ecological Services Field Office
Denver Federal Center
P.O. Box 25486
Denver, CO 80225-0486
(303) 236-4773

Project Summary

Consultation Code: 06E24000-2017-SLI-1229

Event Code: 06E24000-2018-E-00921

Project Name: WB PPSL

Project Type: TRANSPORTATION

Project Description: The Proposed Action would add a westbound peak period shoulder lane and/or related improvements from approximately the Veterans Memorial Tunnels and the US 40/I-70 interchange. This managed lane would be used during peak periods, defined as Saturdays, Sundays, and holidays, to improve travel times and operations. The project extends from milepost 243 to milepost 230,

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/39.75325323678923N105.5543213564244W

Counties: Clear Creek, CO

Endangered Species Act Species

There is a total of 9 threatened, endangered, or candidate species on this species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 5 of these species should be considered only under certain conditions. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

Mammals

NAME	STATUS
Canada Lynx *Lynx canadensis* Population: Contiguous U.S. DPS There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3652	Threatened
North American Wolverine *Gulo gulo luscus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5123	Proposed Threatened

Birds

NAME	STATUS
Least Tern *Sterna antillarum*	Endangered

Population: interior pop.
No critical habitat has been designated for this species.
This species only needs to be considered under the following conditions:

- Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

Species profile: https://ecos.fws.gov/ecp/species/8505

Mexican Spotted Owl *Strix occidentalis lucida*	Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/8196

Piping Plover *Charadrius melodus*	Threatened

Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered.
There is **final** critical habitat for this species. Your location is outside the critical habitat.
This species only needs to be considered under the following conditions:

- Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

Species profile: https://ecos.fws.gov/ecp/species/6039

Whooping Crane *Grus americana*	Endangered

Population: Wherever found, except where listed as an experimental population
There is **final** critical habitat for this species. Your location is outside the critical habitat.
This species only needs to be considered under the following conditions:

- Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

Species profile: https://ecos.fws.gov/ecp/species/758

Fishes

NAME	STATUS
Greenback Cutthroat Trout *Oncorhynchus clarki stomias*	Threatened

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/2775

Pallid Sturgeon *Scaphirhynchus albus*	Endangered

No critical habitat has been designated for this species.
This species only needs to be considered under the following conditions:

- Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

Species profile: https://ecos.fws.gov/ecp/species/7162

Flowering Plants

NAME	STATUS
Western Prairie Fringed Orchid *Platanthera praeclara*	Threatened

No critical habitat has been designated for this species.

This species only needs to be considered under the following conditions:

- Water-related activities/use in the N. Platte, S. Platte and Laramie River Basins may affect listed species in Nebraska.

Species profile: https://ecos.fws.gov/ecp/species/1669

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

REFUGE INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service[3]. There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured. Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or are known to have particular vulnerabilities in your project location. To learn more about the levels of concern for birds on your list, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your specific project area. To see maps of where birders and the general public have sighted birds in and around your project area, visit E-bird tools such as the E-bird data mapping tool (search for the scientific name of a bird on your list to see specific locations where that bird has been reported to occur within your project area over a certain time-frame) and the E-bird Explore Data Tool (perform a query to see a list of all birds sighted in your county or region and within a certain time-frame). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list can be found below.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC), but is of concern in this area either because of the Eagle Act, or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Mar 20 to Sep 15
Brown-capped Rosy-finch *Leucosticte australis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jun 15 to Sep 15
Black Rosy-finch *Leucosticte atrata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and	Breeds Jun 15 to Aug

Alaska. https://ecos.fws.gov/ecp/species/9460	31
Black Swift *Cypseloides niger* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8878	Breeds Jun 15 to Sep 10
Brewer's Sparrow *Spizella breweri* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9291	Breeds May 15 to Aug 10
Golden Eagle *Aquila chrysaetos* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/1680	Breeds Apr 1 to Aug 31
Long-eared Owl *asio otus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3631	Breeds Mar 1 to Jul 15
Olive-sided Flycatcher *Contopus cooperi* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31
Pinyon Jay *Gymnorhinus cyanocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9420	Breeds Feb 15 to Jul 15
Rufous Hummingbird *selasphorus rufus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8002	Breeds elsewhere
Willow Flycatcher *Empidonax traillii* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/3482	Breeds May 20 to Aug 31
Willet *Tringa semipalmata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php

- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeas

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

FRESHWATER POND

- PUBF
- PUBG

Appendix B.

Meeting Minutes

HDR | ONE COMPANY *Many Solutions*℠

Meeting Minutes

Subject:	SWEEP Meeting #2
Client:	CDOT Region 1
Project:	I-70 Peak Period Shoulder Lane
Project No:	215164
Meeting Date:	December 5, 2013
Meeting Location:	CDOT Golden
Notes by:	Sandy Beazley and Britton Marchese

ATTENDEES:

HDR:	Sandy Beazley, Gina McAfee, Tammy Heffron, Britton Marchese
CDOT:	Holly Huyck, David Singer, Francesca Tordonato, Samer Alhaj
EPA:	Sarah Fowler
THK:	Kevin Shanks
Atkins:	Allan Brown
CH2M Hill:	Mandy Whorton
PB:	Jason Longsdorf
Matrix Design:	Robert Krehbiehl
Clear Creek County:	Trent Hyatt, Jo Ann Sorenson

DISTRIBUTION: Attendees, SWEEP members, Project File

SUMMARY OF DISCUSSION:

1. Introductions
2. PPSL Project Overview
   a. Gina provided an overview of the project.
   b. Sarah asked what the cross section is—it was described as primarily a signage and striping effort, with minimal widening throughout the corridor. The number of entry points is currently unknown.
3. Wetland impacts
   a. Sandy discussed wetland impacts. Five wetlands were delineated; others were conservatively assumed to be wetlands based upon a windshield survey (because they were inaccessible for safety reasons during flooding).
   b. Potential impacts are limited to wetlands #1 and #3. Impacts at wetland #1 will likely be avoided entirely.
   c. Wetland impacts to #3 would result from improvements to Water Wheel Park. This will be mitigated by creating additional wetlands, potentially resulting in more wetland acreage than currently present.
   d. **Once wetland impacts have been determined, this information will be communicated to the SWEEP group electronically**.

4. Floodplain impacts
    a. Robert noted the success of the team in avoiding floodplain impacts. The only adverse impact is adjacent to the retaining wall at the upstream side of SH 103. The crib wall is being scoured and adding sediment to the Creek. The wall will be refaced—expanding the width into the creek. This will include stabilizing the creek edge in front of the wall, leaving large boulders in place. Material will be removed and the bed lowered to result in a net zero effect to floodplains. Coordination with Trent (CCC) has occurred to discuss permitting. Since there are no impacts a CLOMR is not needed but a LOMR will be necessary. Samer clarified that there will be no adverse effect.
    b. It is not currently known how much the wall will be lengthened to the west; additional analyses will be conducted to ensure that the tailings to the west are avoided. CDPHE directed that tailings be reburied or taken to a depository.
    c. Review borings taken to determine if they were taken far enough west (Brian Partington with Pinyon has that data). This has been completed, see Action Items below.
    d. Coordination with Rena (USACE) has occurred, resulting in the stacking of the NWP permits (#3 and #42), one for maintenance and one for recreation.
    e. Sarah Fowler had questions about the permitting process and will follow up with the Corps.
    f. Coordination has not begun with the rafting community, but is forthcoming. The team is trying to schedule a meeting with rafting representatives in early January.
5. Riparian vegetation impacts
    a. Riparian impacts are currently calculated to be 0.5 acre. This number is conservative as it is based on a 10-foot buffer, including the west portion of the study area where improvements will be limited to signage only.
    b. If impacts to riparian vegetation change, it will be communicated to the group.
6. Sarah Fowler had questions about the NEPA approval process—Gina noted that there will be Technical Memos developed to support a CATEX and FHWA approval is expected in March.
7. CPW fish data
    a. CPW conducted limited surveys: brown trout are present throughout Clear Creek, but there are no redds upstream or downstream of SH 103. There will be no impacts to spawning habitat.
    b. A CPW macro invertebrate survey is in process. The project team will incorporate this data into the analysis if it is received in time.
8. Proposed permanent BMPs
    a. BMPs will be developed.
9. Water Quality treatment during construction (Robert)
    a. ~50 acres of existing pavement in EB
    b. Project will add ~1.5 acres in EB throughout the corridor (a 3% increase)

c. The goal is to ensure that WQ is not made worse, meaning that we must capture at least 3% of the runoff, but we are able to capture and treat 20% to 25% of runoff with the proposed BMPs.

d. Eight sediment basins are proposed (treats 15% of the runoff)

e. Nine inlets are proposed, and typically integrated with the retaining walls (inliets treats 10% of the runoff).

f. Curb and gutter will be implemented, ~4500 feet, to direct water to water treatment structures.

g. Recommendations from SCAP document will be implemented, where feasible.

h. Will water quality improvements be developed at pull outs to catch spills? This conversation has not yet occurred.

i. Jo Ann asked who owns the port-of-entry parcel at MP 234. Ownership will be confirmed and this parcel will be used for water quality if possible. Date of right-of-way surveys needs to be confirmed.

j. The table below summarizes water equality treatment in the study area.

EB I-70 WQ Treatment

Current Impervious Roadway Area	54.1 acres
EB I-70 PPSL Added Impervious Area	1.5 acres
Proposed Impervious Area	55.6 acres
Proposed Treatment Area	14.0 acres
Proposed Capture—8 Sediment Basins	7.7 acres
Proposed Capture—9 Inlet Basins	6.3 acres
Required C&G	4524 linear feet
Proposed Capture and Treatment Rate	25%

Action Items

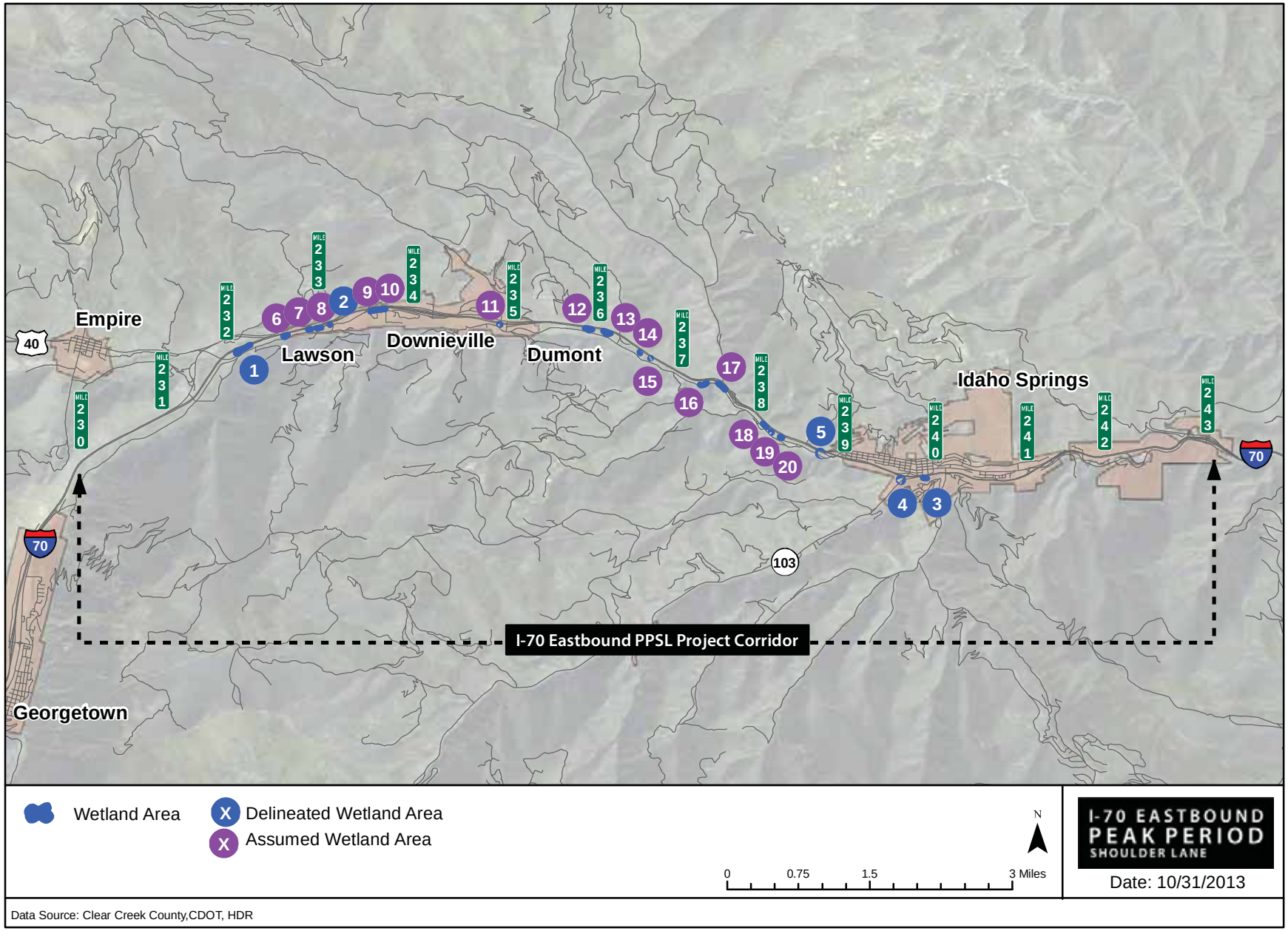
1. Share the Water Wheel park design with the SWEEP committee upon availability.
2. Provide updates should wetland impacts change.
3. Provide updates as riparian impacts are refined.
   a. In process, new calculations likely distributed week of 12/16/14.
4. Provide information regarding the construction techniques of the retaining wall upstream of SH 103.
5. Arrange a meeting with rafting interests.
   a. In process, targeting a meeting the week of 1/16/14/

6. Determine the length of the retaining wall and proximity to Big 5 tailings and ensure the Yeh borings included areas of new wall construction.
    a. Per Brian Partington, another boring beyond the one completed adjacent to the existing wall is unnecessary. CDPHE has given the project permission to simply bury any mine wastes that are found beneath the road or behind the walls. Therefore, the most practical method of dealing with it is to notify the contractor, and have him address with the forthcoming Materials Management Plan.
7. Include a discussion of right-of-way at the port-of-entry at the next Tech Team prep meeting. Who owns it? Can CDOT obtain an easement? Date of right-of-way surveys needs to be confirmed.
    a. In process, follow up discussions with the Clear Creek County to occur 12/16/13.

AGENDA

SWEEP ISSUES TASK FORCE MEETING #2
December 5, 2013
8:30 a.m. to 10:30 a.m.
FHWA Trail Ridge and Central Conf. Rooms 12300 West Dakota Avenue, Suite 180, Lakewood

1. **Introductions**
2. **PPSL Project Overview**
    a. Review of likely wetland impacts
    b. Review of likely floodplain impacts
    c. Review of riparian vegetation impacts
    d. CPW fish data
    e. Review of proposed permanent BMPs
    f. Water quality treatment during construction
3. **Westbound Twin Tunnels Project**
    a. Description of proposed action
    b. Schedule
    c. SCAP improvements
    d. Delay in trailhead improvements and stream restoration
4. **Next Steps**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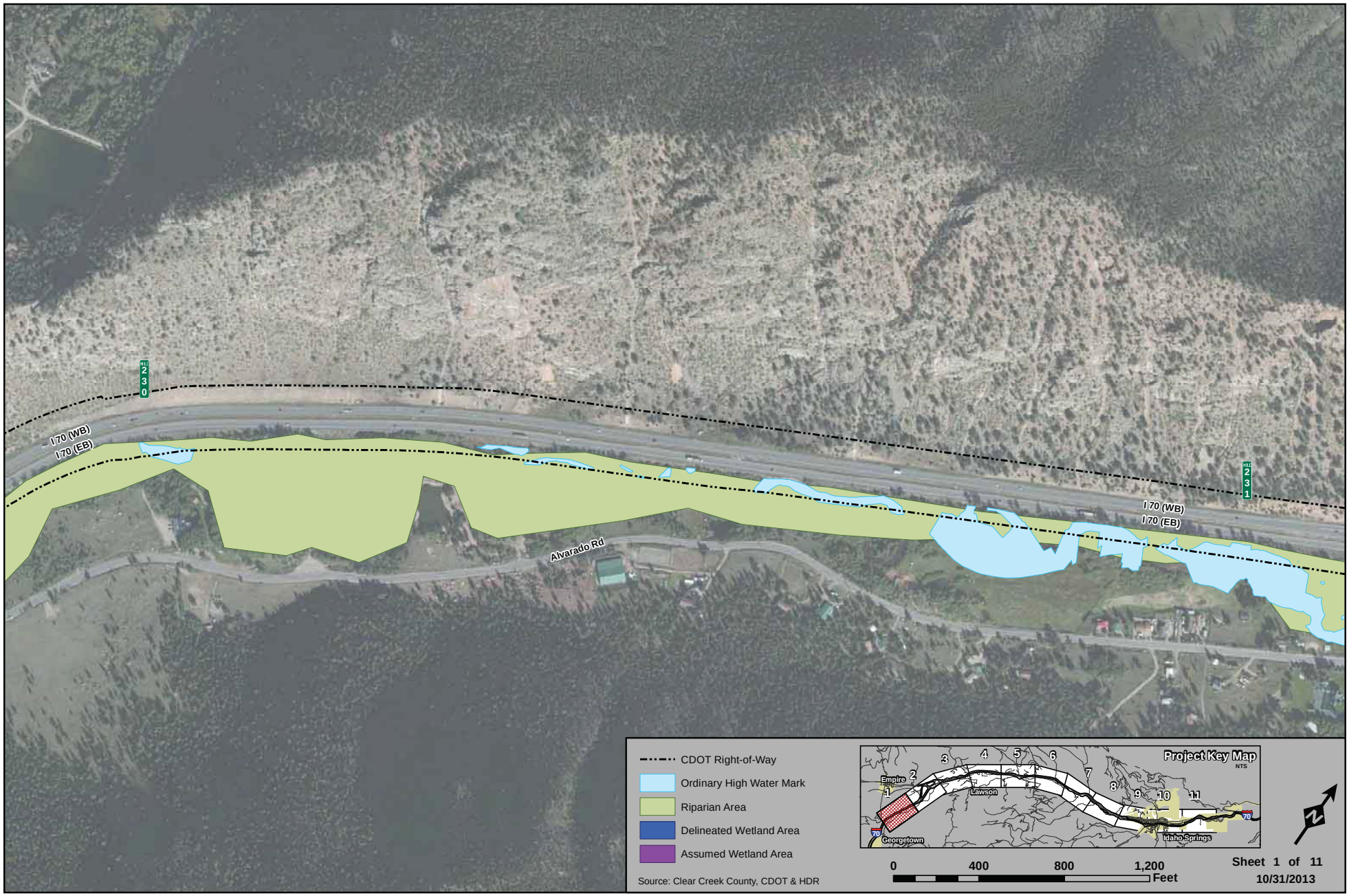
Date: 10/31/2013
Data Source: Clear Creek County,CDOT, HDR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Source: Clear Creek County, CDOT & HDR
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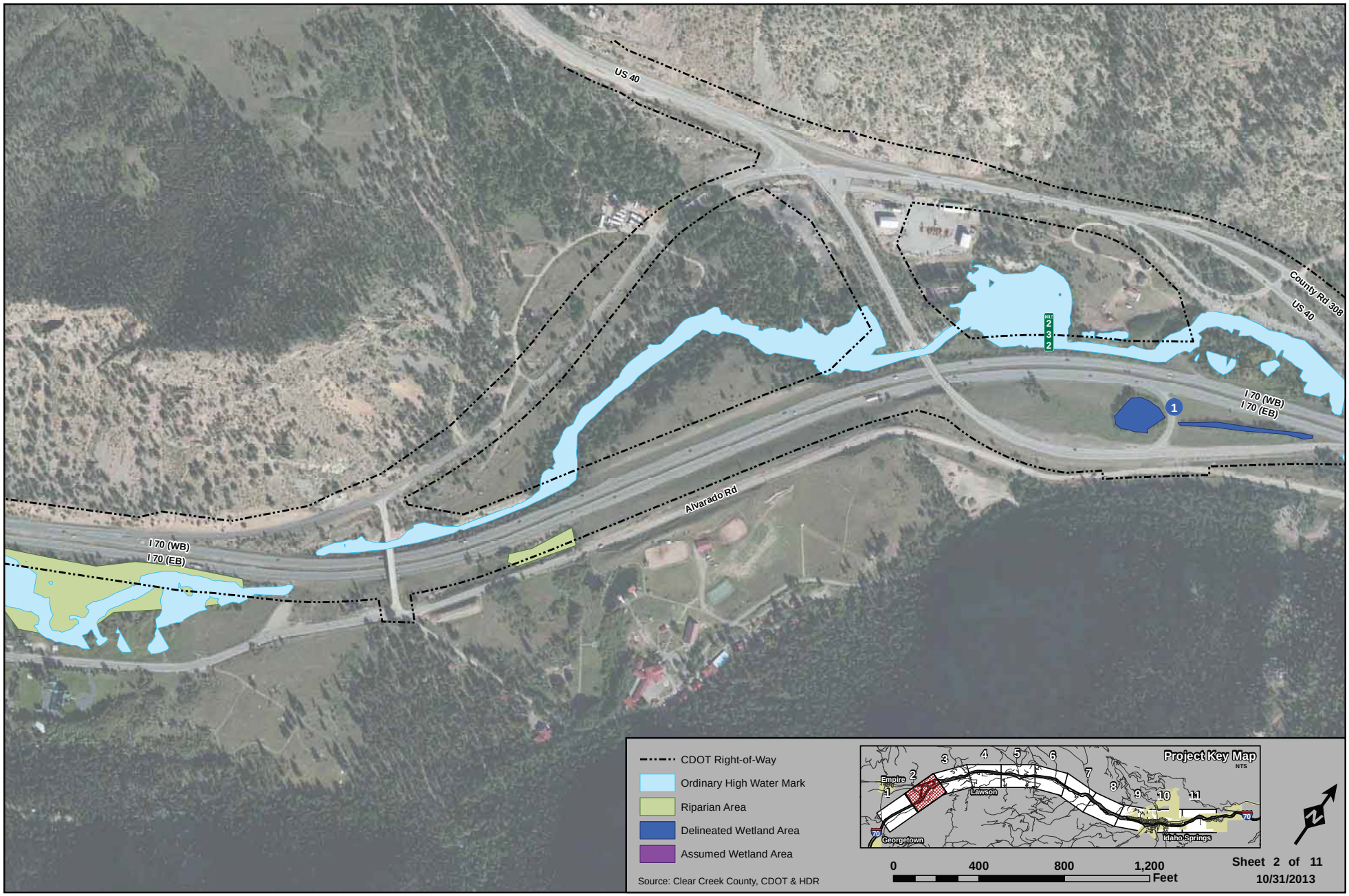
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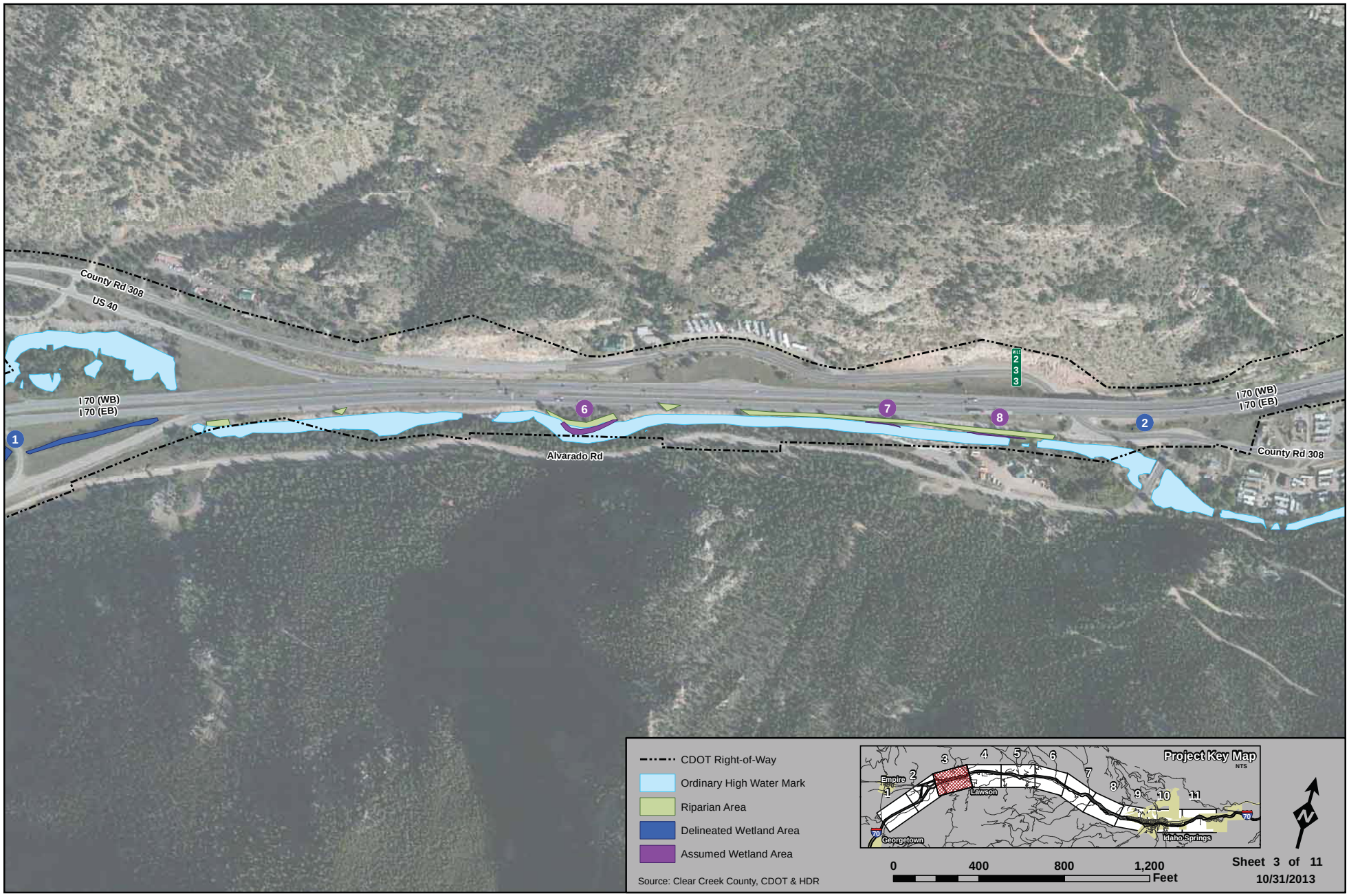
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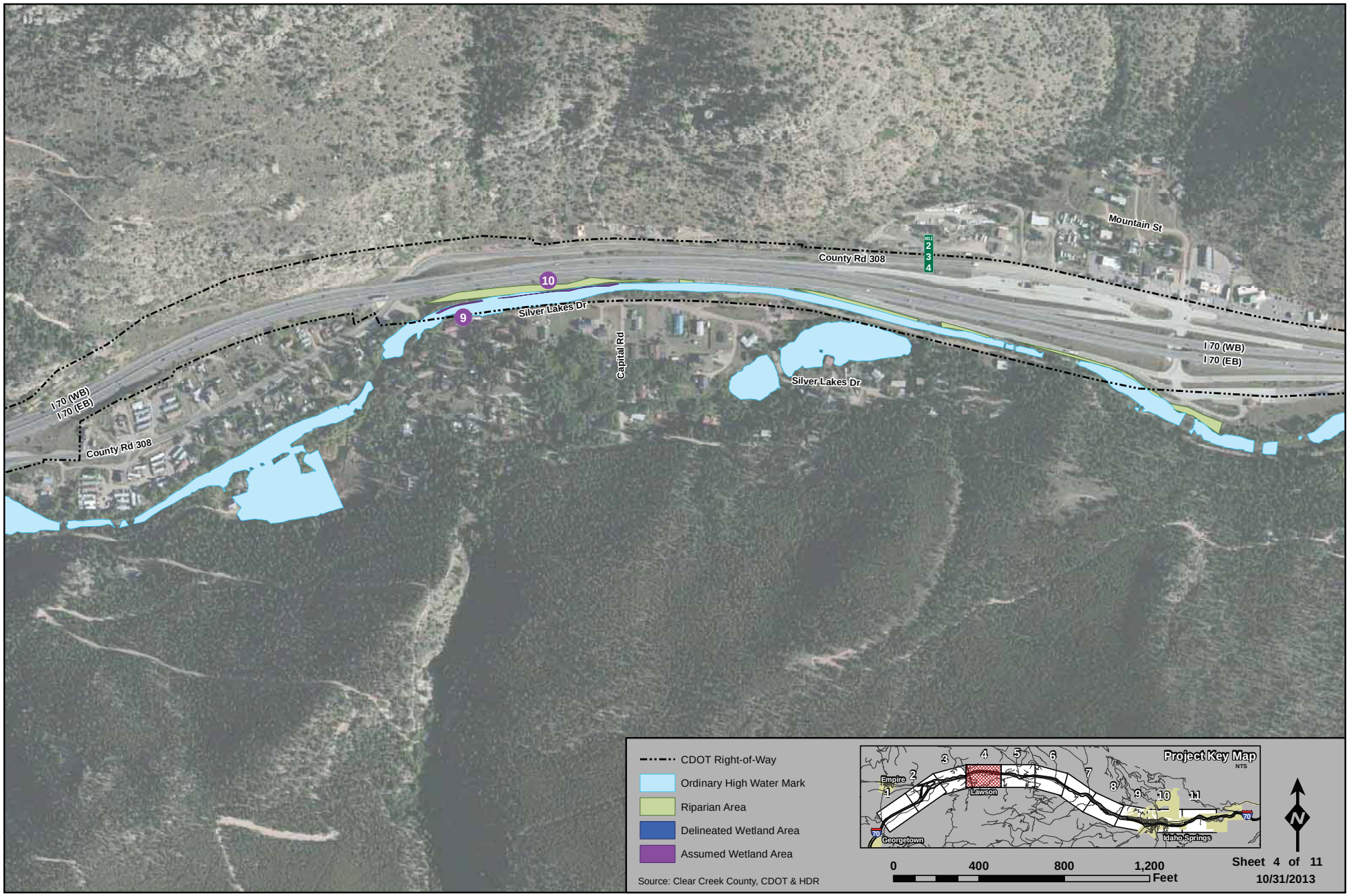
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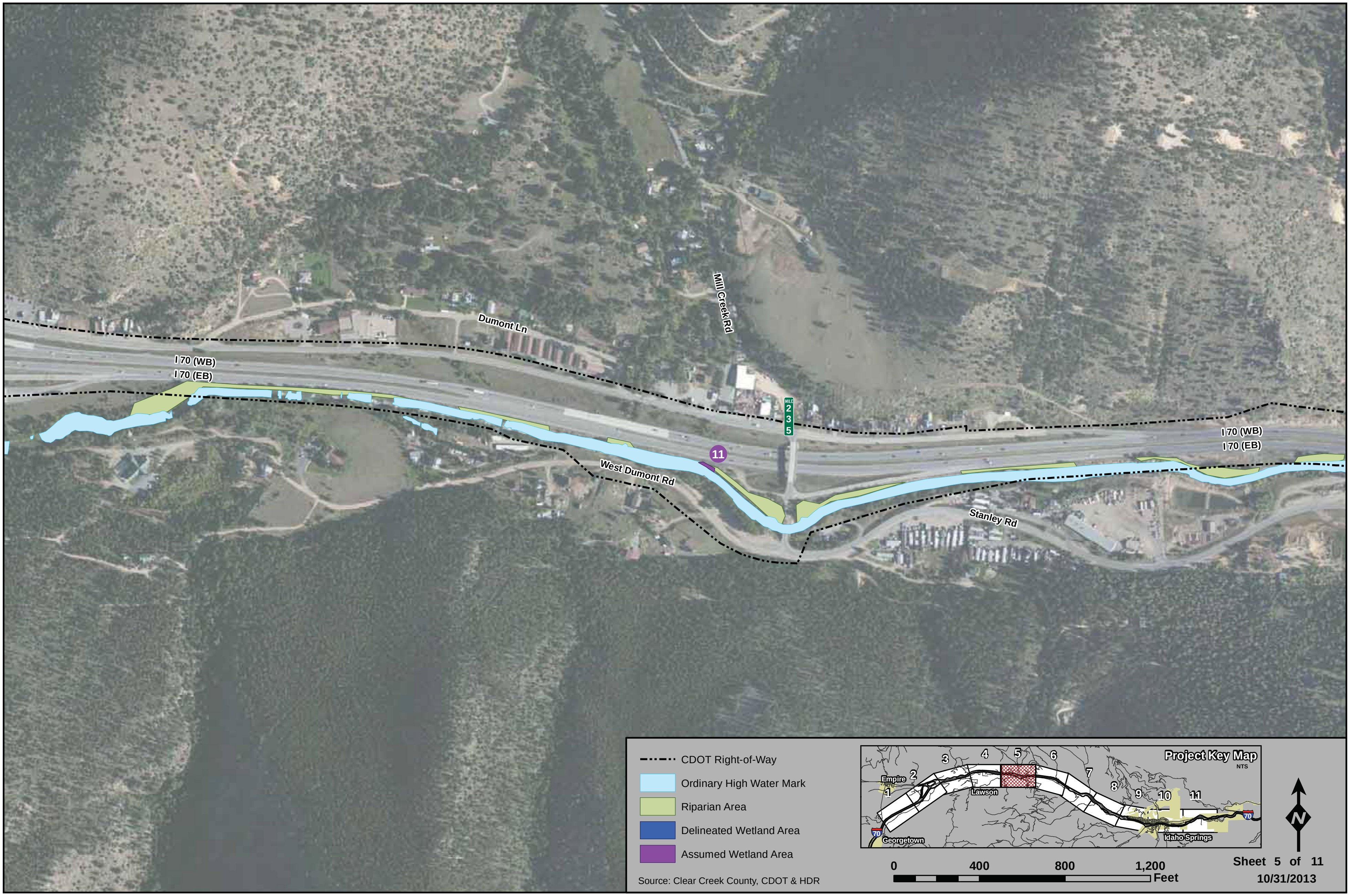

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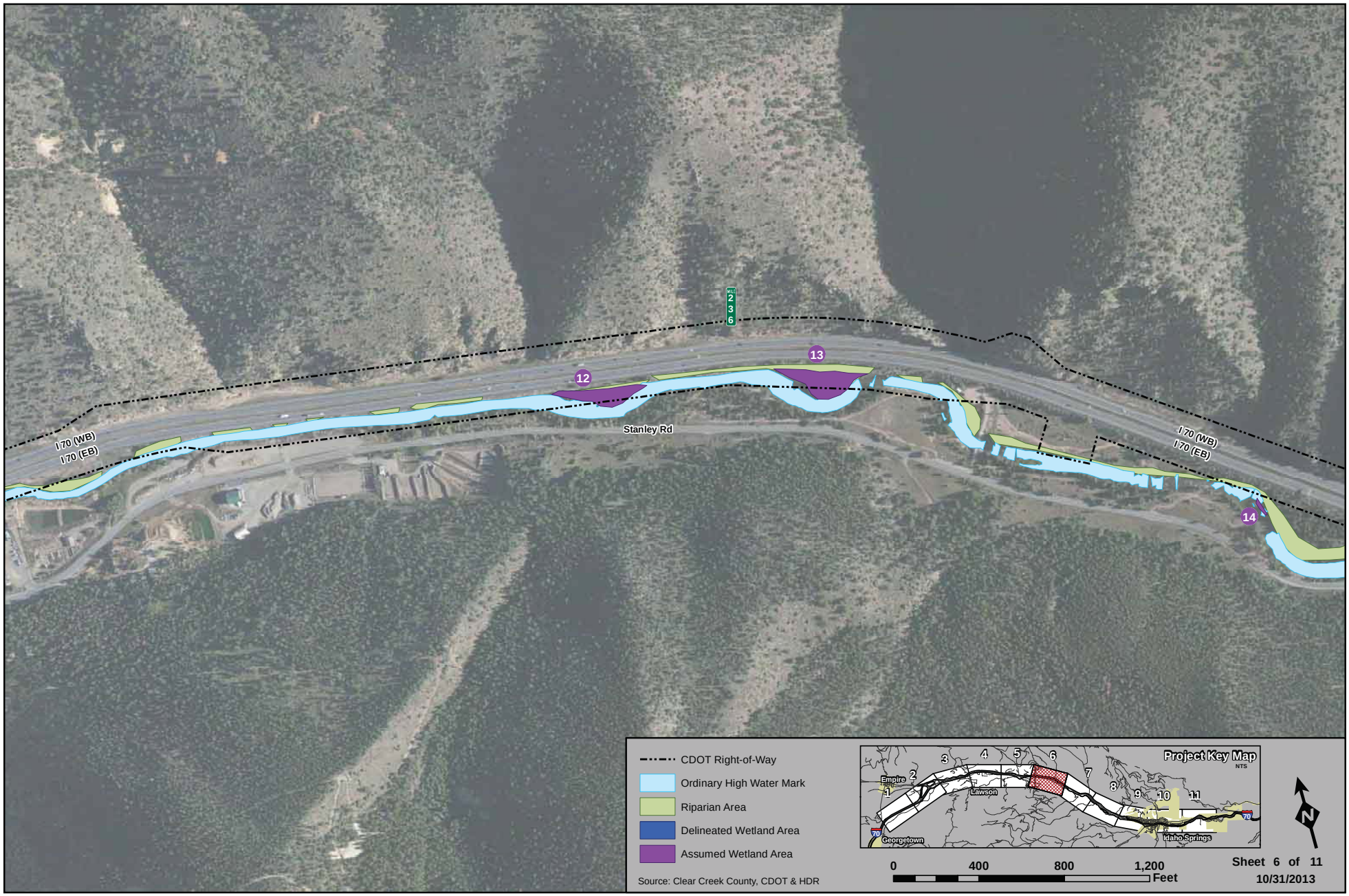
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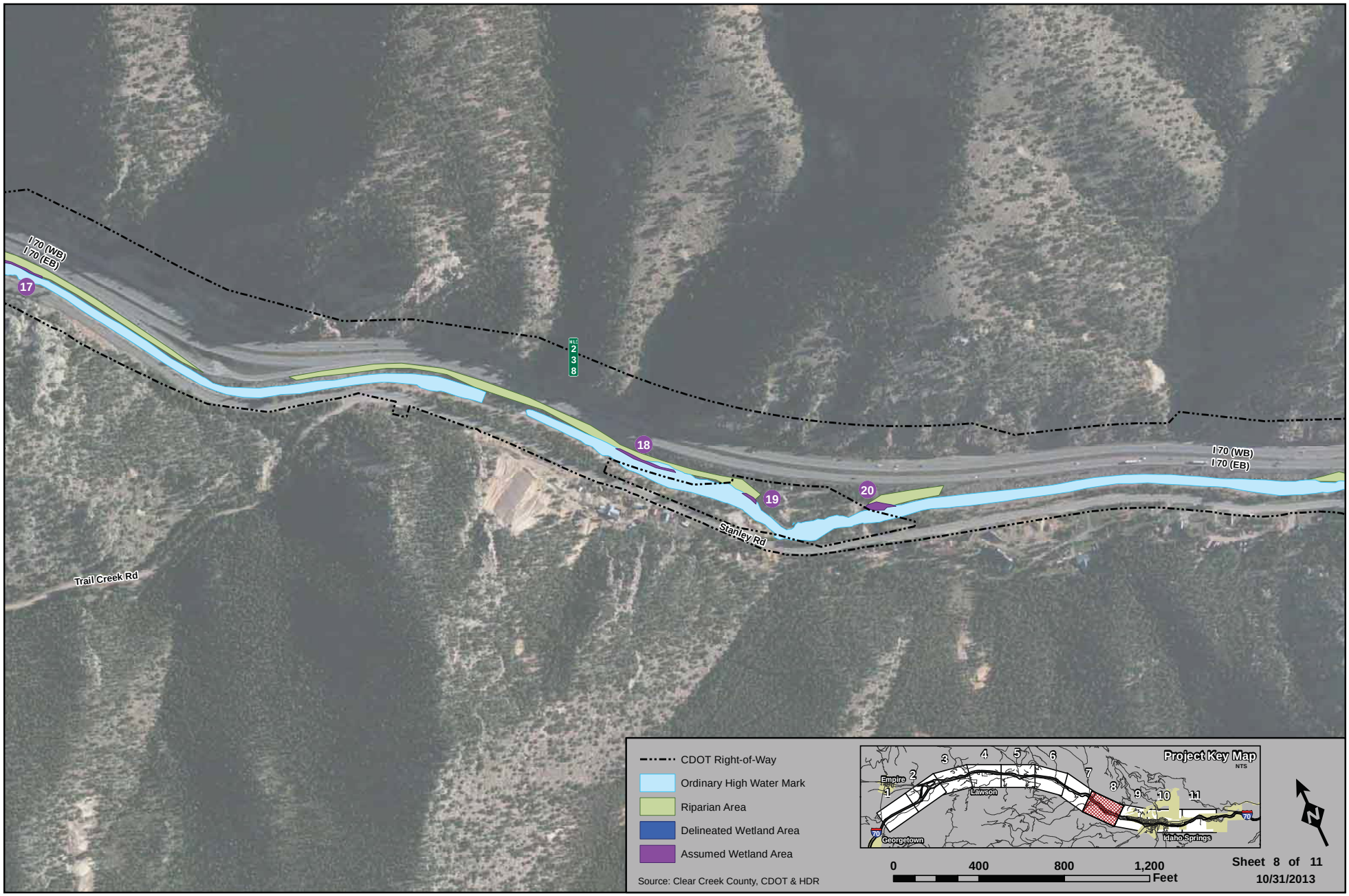
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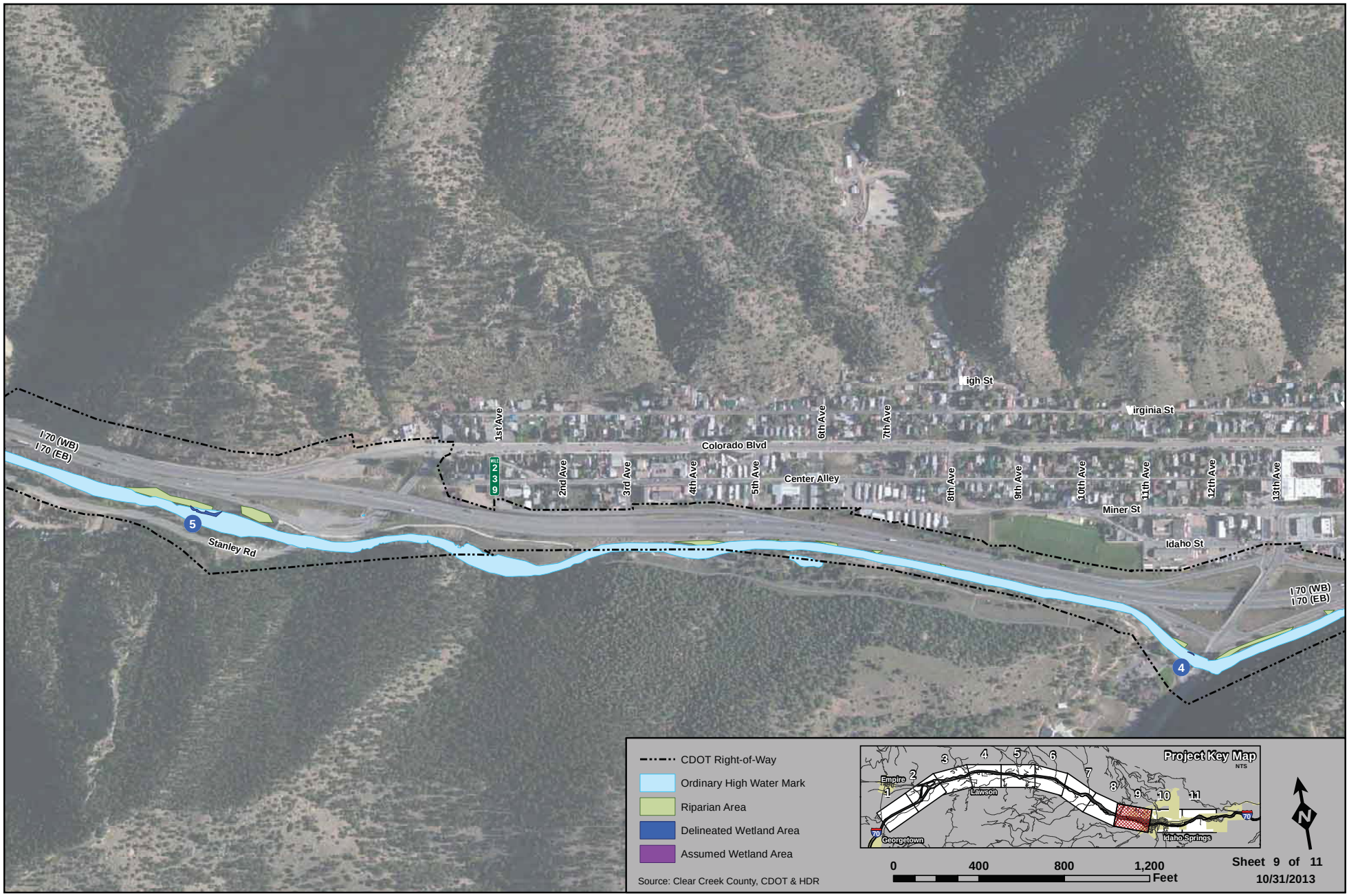
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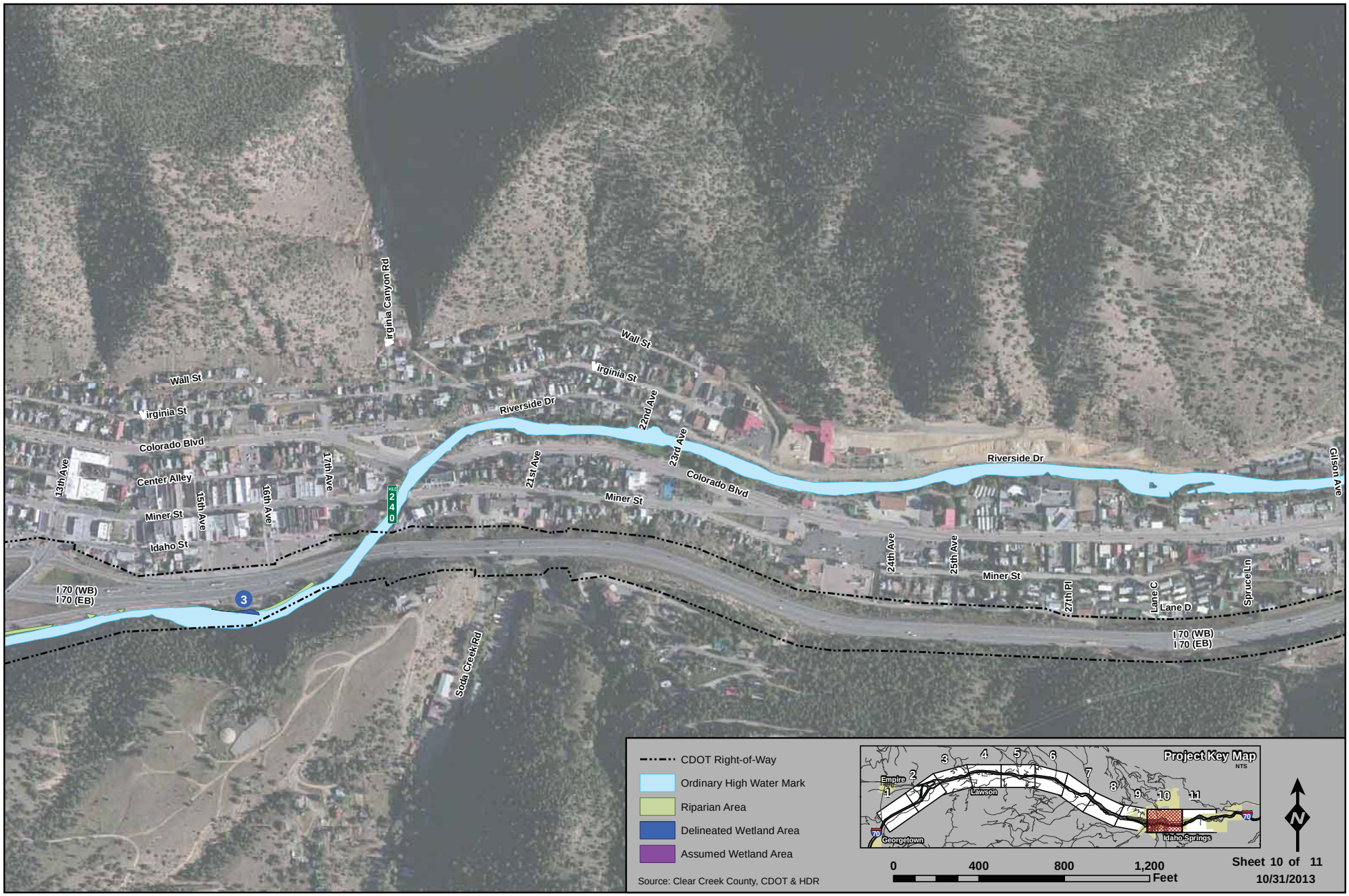
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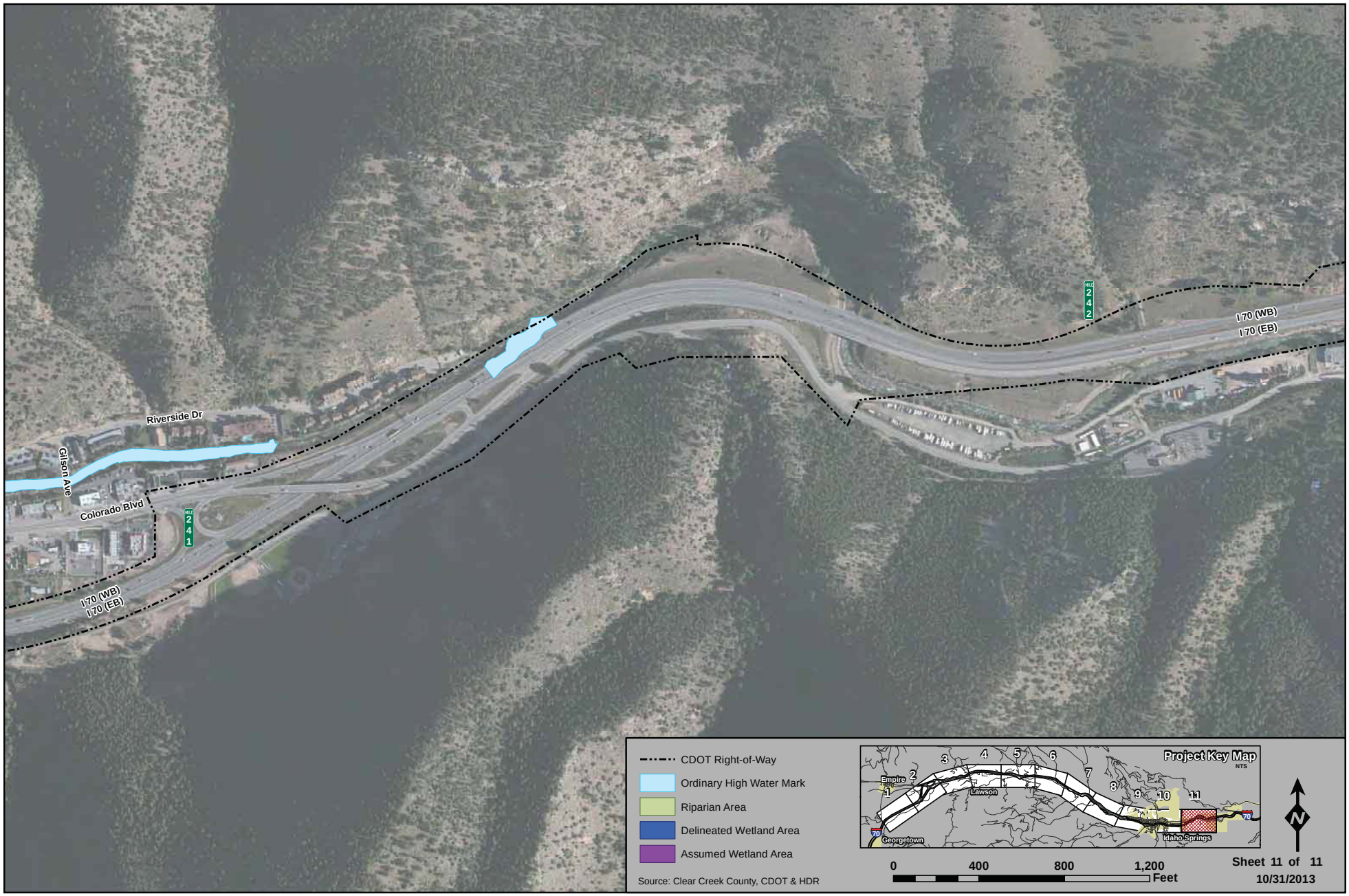
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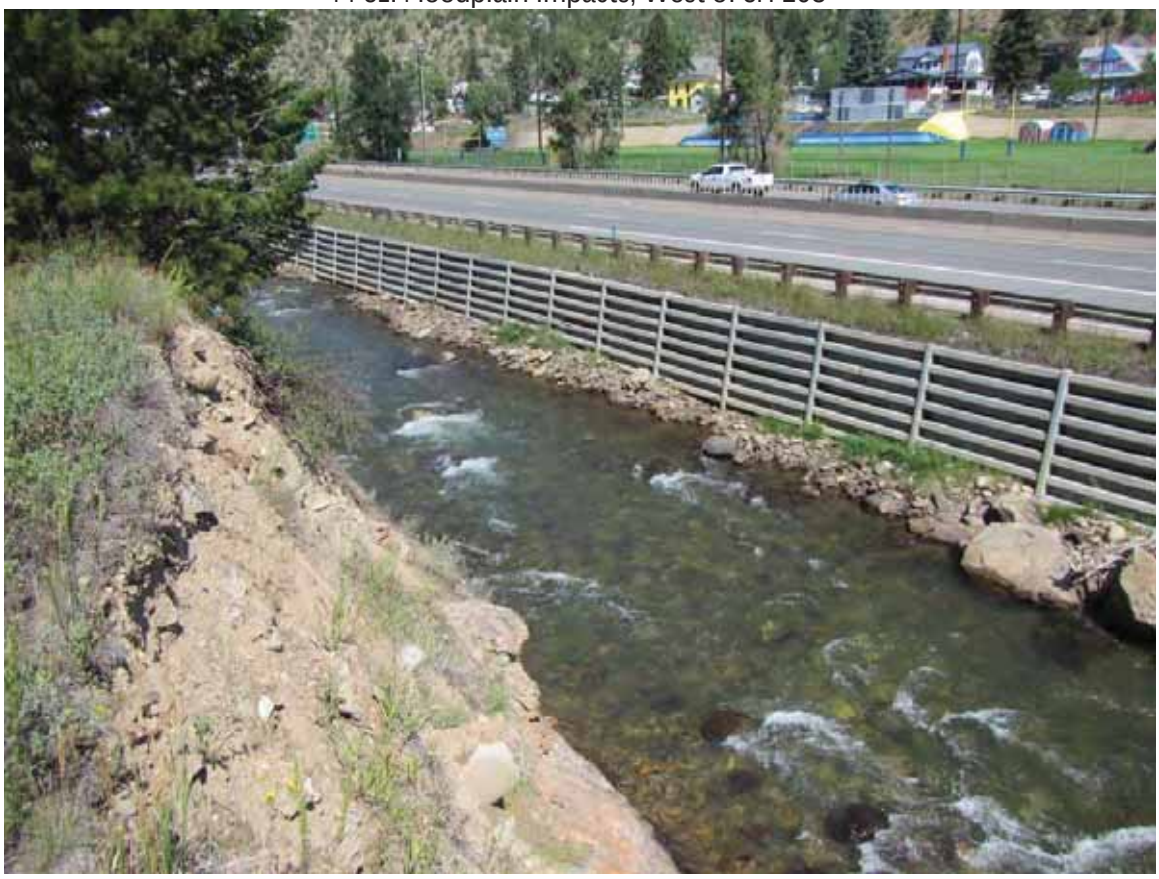
PPSL: Floodplain Impacts, East of SH 103

PPSL: Floodplain Impacts, West of SH 103



WB I-70 Peak Period Shoulder Lane

Meeting Minutes

Project:	WB I-70 Peak Period Shoulder Lane CDOT Project NHPP 0703-445 (21893)
Subject:	Environmental Scoping Meeting
Date:	June 19, 2017
Location:	CDOT HQ Shumate Building | Mt Evans A & B Conference Rooms
Attendees:	See attached sign-in sheet
Distribution	Attendees, File
Attachments	PowerPoint Presentation, Sign-in Sheet

SUMMARY OF DISCUSSION:
[Note: Action items are in **bold**.]

Summary of Action Items	Status
1. Vanessa to provide link to I-70 Mountain Corridor site for previous documents; to be included in meeting minutes.	Complete—see below under #3
2. Vanessa to review noise recommendation and coordinate with FHWA on appropriate time to have noise technical discussion	Complete—see below under #4
3. Wendy to send the visual scoping form to Basil	

1. Meeting Purpose: To present information and solicit input from Environmental specialists and resource leads to incorporate into scoping information (see attached presentation).
2. Project Team (see attached presentation for more information)
   - Introductions
   - Main points of contact for Environmental will be Vanessa and Wendy.
   - Blended team with CDOT and HDR team.
3. Project Background (see attached presentation for more information)
   - Project Limits—Veterans Memorial Tunnels to Exit 229 around Georgetown Lake area (note: this has been revised to Exit 230 since the scoping meeting).
   - Purpose
   - Project background—2016 EB PPSL, 2017 Vision for I-70 Westbound PPSL Corridor Visioning
   - CSS will be conducted by CDR for both projects and will occur concurrently.
   - Other studies—2011 I-70 Mountain Corridor Tier 1 study; now to complete a Tier 2 study.

- **Vanessa to provide link to I-70 Mountain Corridor site for previous documents; to be included in meeting minutes**. The main link to I-70 Mountain Corridor information is: https://www.codot.gov/projects/i-70mountaincorridor. Most of the previous documentation is available at: https://www.codot.gov/projects/i-70mountaincorridor/vision.html.
- Scope—This is an interim project and not the final solution.
- Anticipated to be a documented CatEx.

4. Resources

- *Parks and Recreation Resources/Section 4(f)*
  - There are numerous parks and trail resources.
  - The trail along Clear Creek that goes from City Hall to Water Wheel Park under I-70 was mentioned as a concern. We will need to map it and evaluate potential impacts to it. Impacts could include the snow plows no longer having the shoulder for snow storage so snow and ice may be dumped on trail users.
  - Anticipate no additional right-of-way (ROW).
  - Does the Greenway qualify as a Section 4(f) resource? If in CDOT ROW, it may not be considered a Section 4(f) resource.
  - In MOU or IGA that it is a transportation resource, there is an MOU for the Greenway.
  - Georgetown Lake is a Section 6(f) resource.
- *Bicycle and Pedestrian Facility*
  - Includes new bridge for Fall River Road
  - Coordination with the Greenway project
  - Removed ability for bikes to use I-70 EB with EB PPSL project and now removing the ability to use I-70 WB, so mitigation component of project
  - Include discussion in Transportation Memo
- *Cultural Resources/Section 4(f)*
  - Schedule implications
  - Programmatic agreement for Section 106
  - There is a Section 106 Issue Task Force with a meeting scheduled for June 27
  - Survey to begin in July
  - Assuming not having individual Section 4(f) findings
  - Gateway Bridge at Empire Junction—not anticipated to be included into this interim project, but if scope changes, keep in mind
- *Transportation*
  - Advanced Guideway System (AGS) review to ensure won't be precluded
  - Look at bus travel time and consider operations.
- *Noise*
  - Have not determined what type of analysis
  - Noise levels at or above abatement criteria already
  - If walls are required, then need to consider aesthetics criteria and visual impacts

  - Part of the EB commitment was to monitor noise after construction and there hasn't been a significant difference between pre- and post-construction in addition to when the PPSL is in use versus when not in use
  - Meeting with FHWA to determine general philosophy
  - Idaho Springs is looking into economic development, and walls may impact that
  - Benefitted receptor survey can happen during NEPA rather than closer to construction (discussion about how potential new noise walls and Section 106 visual impacts may be competing and should know for Section 106 consultation).
  - **Vanessa will review consultant recommendation for noise and coordinate with FHWA on when the noise technical discussion should occur.** (NOTE this has happened and the meeting is scheduled for July 19.)

- *Socioeconomics*
  - Biggest impacts will likely be construction; access and visual impacts—not just how things look, but if there is still good visibility to see businesses after construction.
  - It is planned to have a Bustang stop at Exit 240 on the EB and WB off-ramps.
  - Look into actual data from EB PPSL on impacts during construction and operations related to socioeconomics.
  - Consider Colorado Boulevard construction impacts.
  - Clear Creek County is currently doing an economic strategy study which should be completed by December 2017.
  - A market analysis completed by THK could provide a lot of good background information.
  - Henderson mine may not completely close down, but may reduce production.

- *Environmental Justice*
  - Idaho Springs, Lawson, and Dumont contain low-income and/or minority populations.
  - The team will reach out to engage the public.

- *Visual and Aesthetics*
  - Compliance with FHWA Visual Guidelines.
  - Scoping form is being reviewed internally and will send out to CDOT for review.
  - Signing and lighting similar to EB.
  - Apply to walls on the corridor.
  - Need to be sure to consider rock cuts and treatments.
  - CDOT is completing a rock cut study and will share at the end of summer.
  - CDOT initiated a PLT with the County to address rock fall mitigation.

- *Water Resources*
  - Coordination with the Stream and Wetland Ecological Enhancement Program (SWEEP) and use of I-70 Clear Creek Sediment Control Action Plan (SCAP).
  - EB PPSL included some best management practices (BMPs) and pieces of the SCAP were implemented on that project.

- *Wildlife/Fisheries Resource*
  - Coordination with A Landscape Level Inventory of Valued Ecosystems (ALIVE).
  - There is a LIZ identified at Empire Junction.
  - Other animals include big horn sheep, lynx.
  - Clear Creek is a high value fishery.
  - There are potential conflicts between rock fall mitigation and raptors and CDOT has a research study in progress now in Clear Creek Canyon that will be completed in the fall about how to deal with conflicts between raptors and rock fall mitigation (raptors have been getting caught in netting).
  - CPW involvement during the concept development process flagged bighorn sheep habitat and bighorn sheep/vehicular accidents as issues.
- *Geological Resources*—one of the larger design challenges.
- *Other Resources: Brief Analysis*
  - Bevel Amendment to provide guidance on mine waste, allow to move material within the same area.
  - For EB the material was capped in place.
  - Medians were considered farmlands per NRCS on EB.
  - Also make sure to include the planned Idaho Springs transit center in the cumulative analysis.
- *Other—L*ook at having a resource agency meeting in a few weeks. (NOTE that since the scoping meeting, it was determined to combine the resource scoping agency meeting with the Technical Team meeting that includes the resource agencies as was done for EB.)

5. Stakeholder Input
   - CSS Process and extensive coordination.
6. Expectations
   - Provide scoping input, timely review of deliverables, and participation in ITF and TT meetings as needed.
7. Questions/Discussion

WB I-70 Peak Period Shoulder Lane

CDOT Project NHPP 0703-445
Subaccount 21893

Environmental Scoping Meeting

June 19, 2017

WB I-70 Peak Period Shoulder Lane

Project Team

HDR

apexdesign

HK associates, inc.

PK Electrical, Inc.

Yeh and Associates, Inc.
Consulting Engineers & Scientists

ECO-resolutions, LLC

Ulteig

PALEO SOLUTIONS
Paleontological Compliance and Consulting Services

Pinyon Environmental, Inc.

ARLAND
Land Use Economics

WOOLPERT

WB I-70 Peak Period Shoulder Lane

Blended Team

WEST PROGRAM ENGINEER **Steve Harelson**	CDOT RESIDENT ENGINEER **Ben Acimovic**	CDOT PROJECT MANAGER **Neil Ogden**	CDOT DESIGN PROJECT MANAGER **Adam Parks**
HDR DESIGN PROJECT MANAGER **Chau Nguyen**	SURVEY MANAGER **David Stewart**	CDOT ENVIRONMENTAL MANAGER **Vanessa Henderson**	HDR ENVIRONMENTAL MANAGER **Wendy Wallach**
UTILITY MANAGER **Patricia McKinney-Clark**	MATERIALS ENGINEER **James Chang**	CDOT CONSTRUCTION MANAGER **Robert Smith**	DEPUTY MAINTENANCE SUPERINTENDENT **David Miller**

WB I-70 Peak Period Shoulder Lane

Team Roles

CDOT — Roadway/Roadside Design

Environmental, Public Outreach, Utilities, Drainage, Structures — HDR

apexdesign — ITS, Traffic, Construction Phasing, Concept of Operations

Landscape Architecture — THK

Yeh and Associates, Inc. Consulting Engineers & Scientists — Geotechnical, Materials

Civil Support — Ulteig

PK Electrical, Inc. — Electrical Design

WB I-70 Peak Period Shoulder Lane

Team Roles

Pinyon Environmental, Inc. — Environmental (Hazardous Materials and Air Quality)

Environmental (Wildlife Crossing) — ECO-resolutions, LLC

ARLAND Land Use Economics — Economics, Land Use

Environmental (Paleontology) — Paleo Solutions, Paleontological Compliance and Consulting Services

Woolpert — Supplemental Survey

WB I-70 Peak Period
Shoulder Lane

Project Overview and Background

WB I-70 Peak Period
Shoulder Lane

Purpose/Scope

The purpose of the I-70 Westbound Peak Period Shoulder Lane project is to improve westbound highway operations, safety, and travel time reliability, specifically during peak period times—from the Veterans Memorial Tunnels to US 40 at Empire Junction.

WB I-70 Peak Period Shoulder Lane

Project Background

2016

Eastbound Mountain Express Lanes (EB MEXL) completed

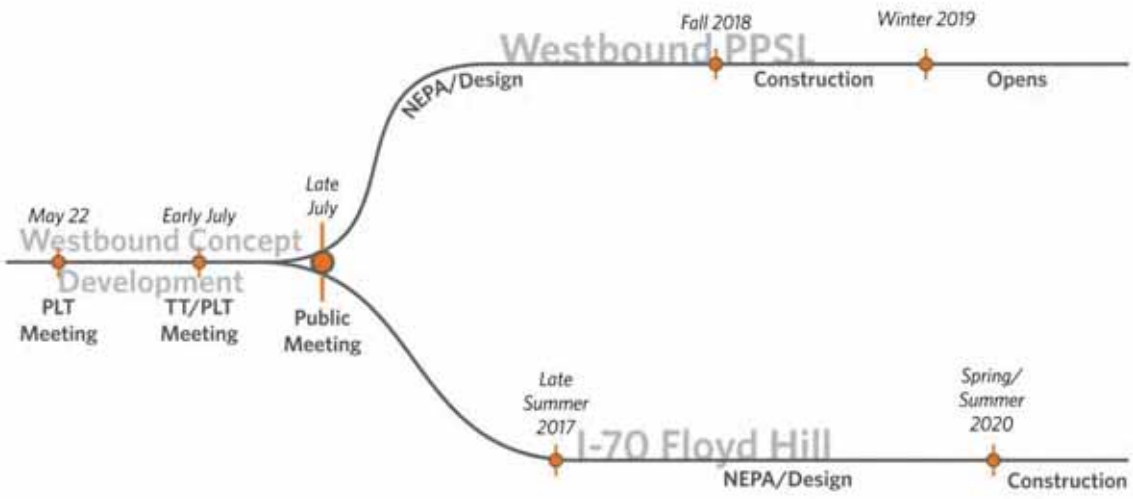
2017

I-70 Concept Development Process/Visioning (anticipated completion: July/August 2017)

Context Sensitive Solutions

CDR (under separate contract)

Westbound I-70 Concept Development Process Transition to NEPA



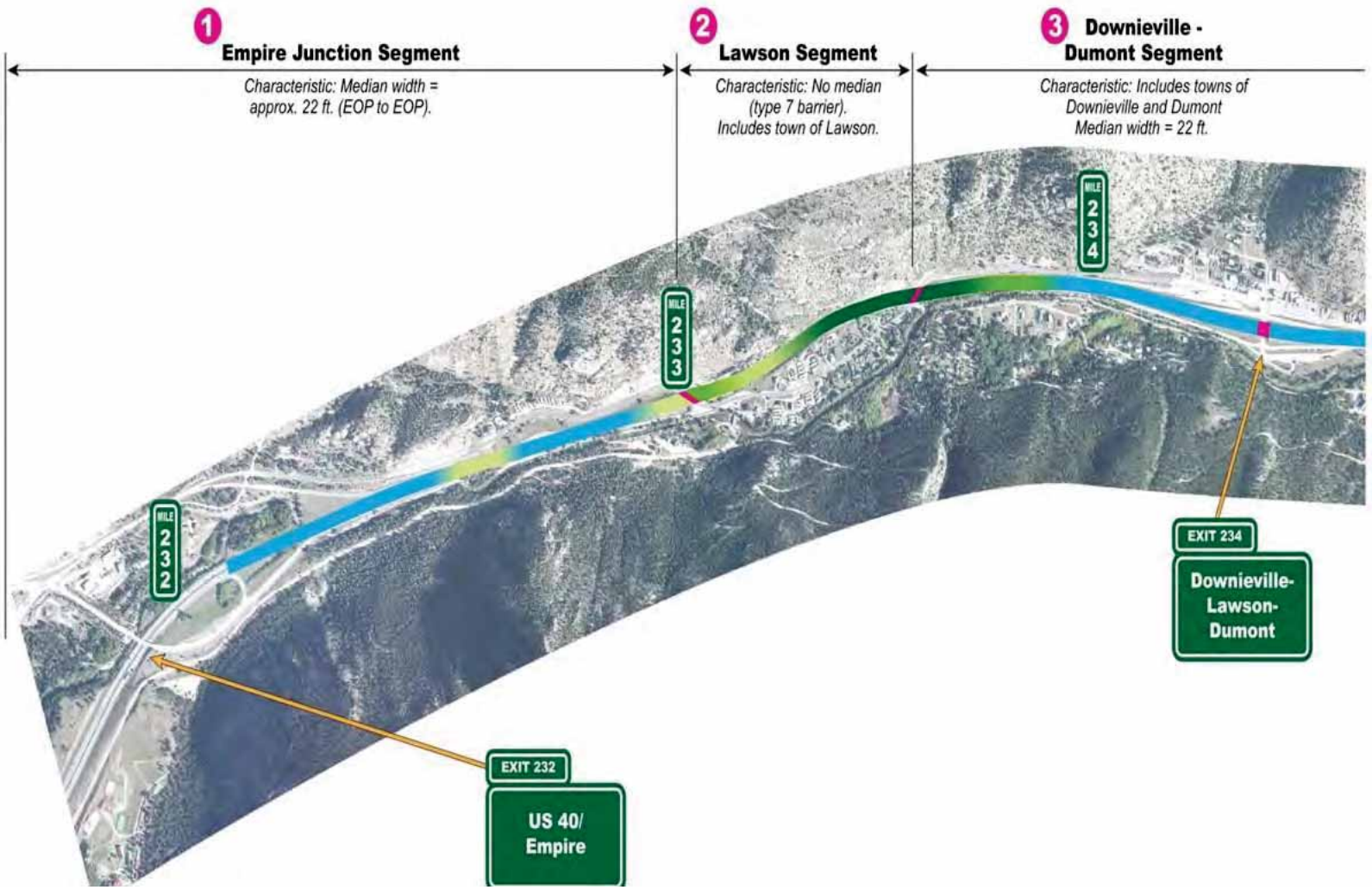
WB I-70 Peak Period Shoulder Lane

Other Studies

- *Clear Creek County 2017 Community Master Plan* (Clear Creek County, 2017)
- *I-70 Mountain Corridor Design Speed Study* (CDOT, 2016)
- *Advanced Guideway System (AGS) Feasibility Study* (CDOT, 2014)
- *Clear Creek County Greenway Engineering and NEPA* (Clear Creek Greenway Authority, 2017)
- *Historic Context and Historic District Evaluations of Dumont, Lawson, and Downieville* (CDOT, 2017)
- *I-70 User Study Final Results* (I-70 Coalition, 2017)
- *Highest and Best Use Economic Feasibility Study for the Interstate 70 Economic Hub at Exit 240* (Idaho Springs, 2016)
- *Westbound Concept Development Process* (CDOT, 2017)

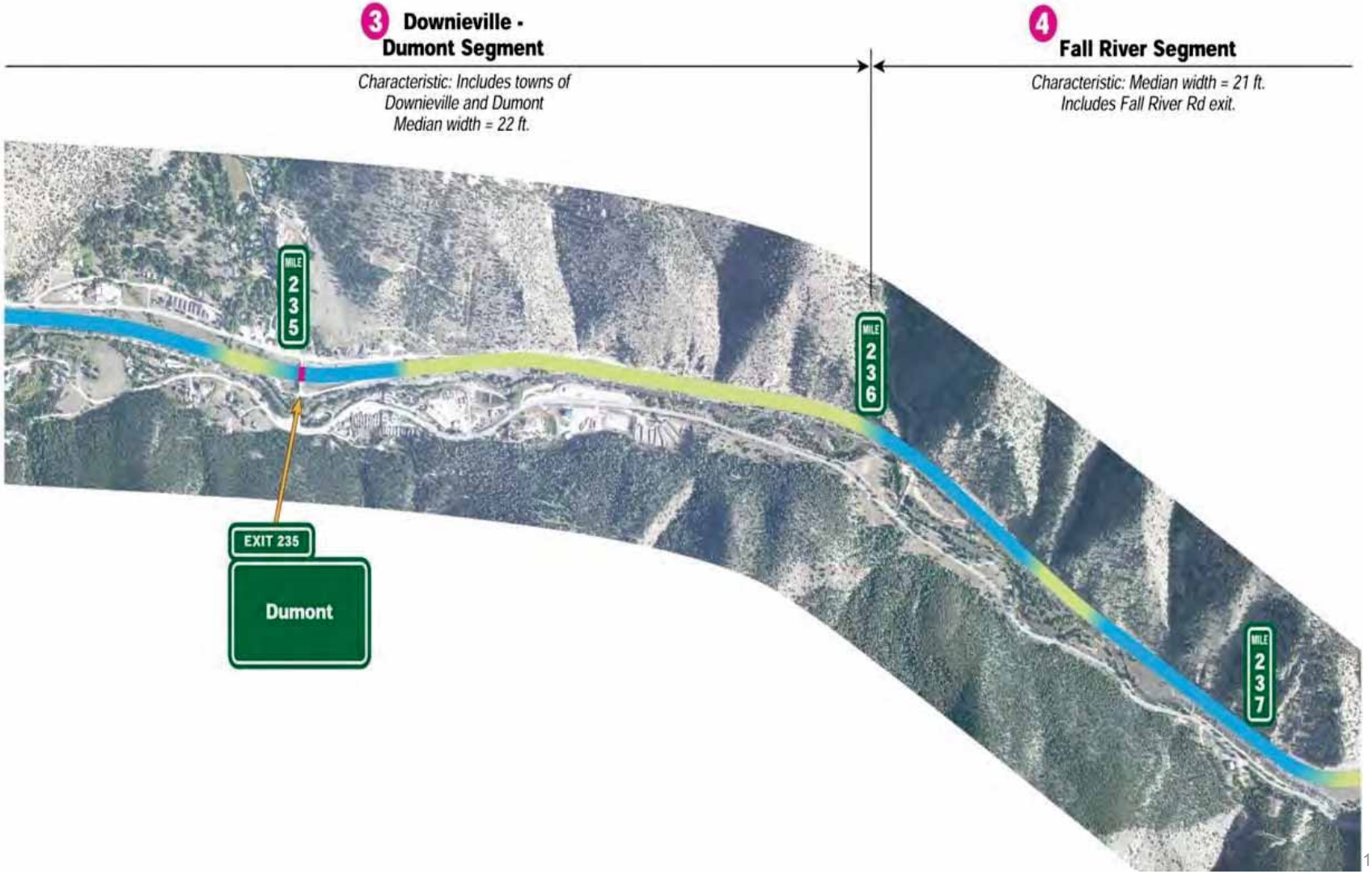
WB I-70 Peak Period
Shoulder Lane

Corridor Segments



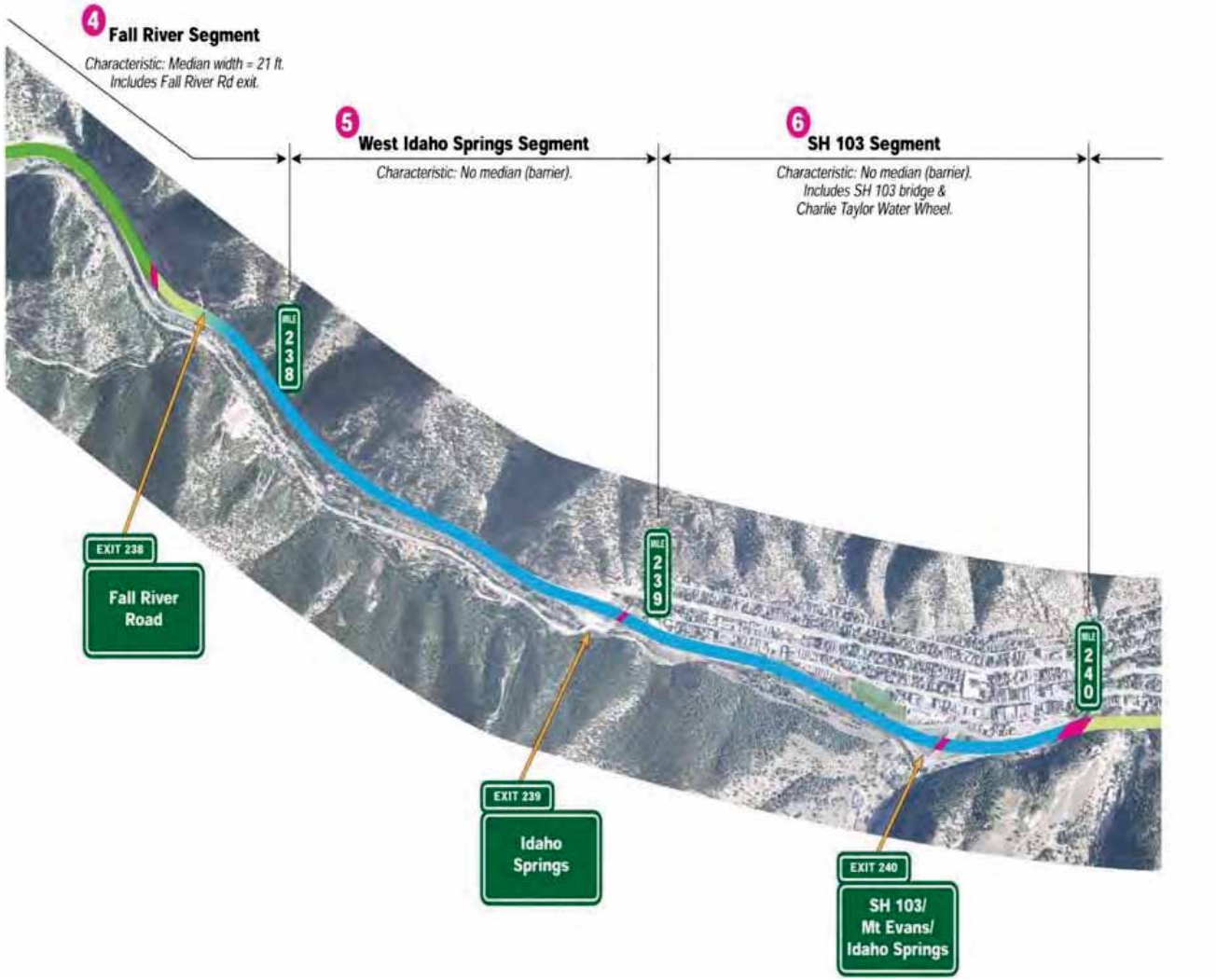
WB I-70 Peak Period
Shoulder Lane

Corridor Segments



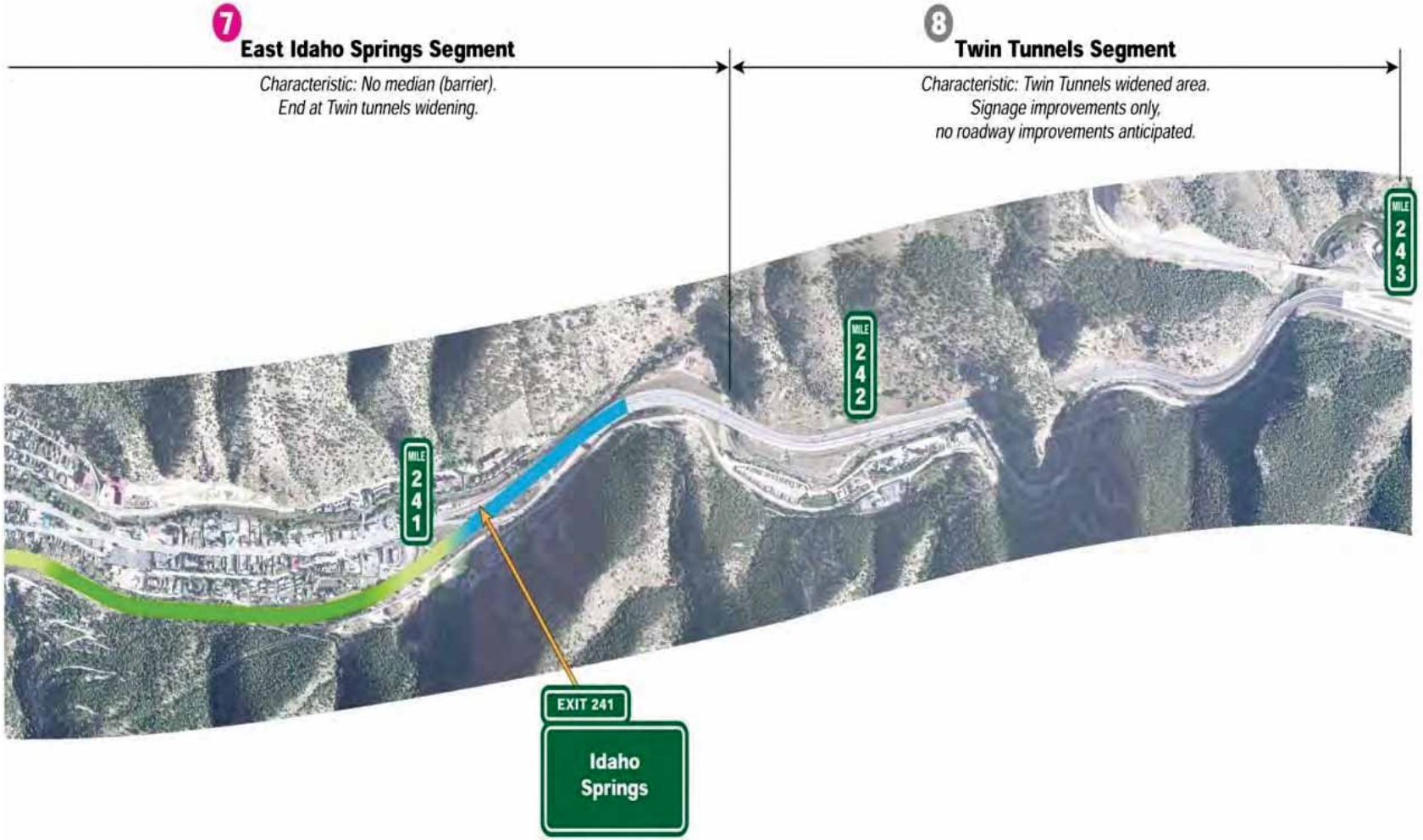
WB I-70 Peak Period
Shoulder Lane

Corridor Segments



WB I-70 Peak Period
Shoulder Lane

Corridor Segments

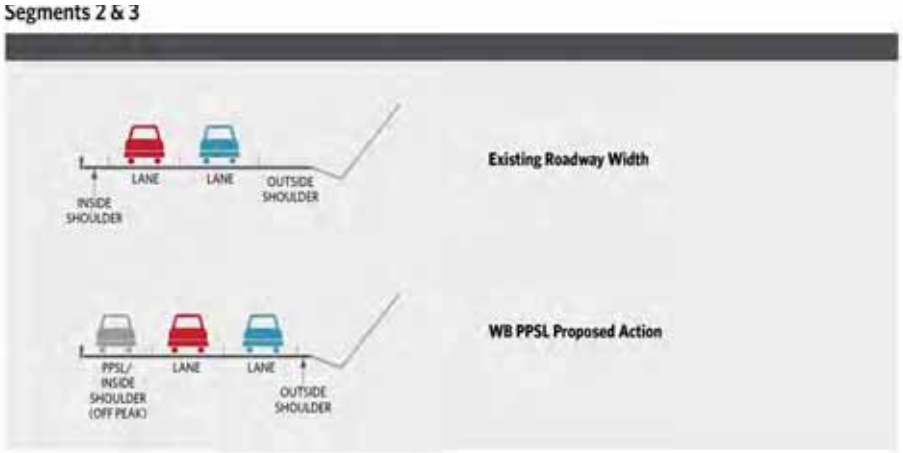


WB I-70 Peak Period Shoulder Lane

Purpose/Scope

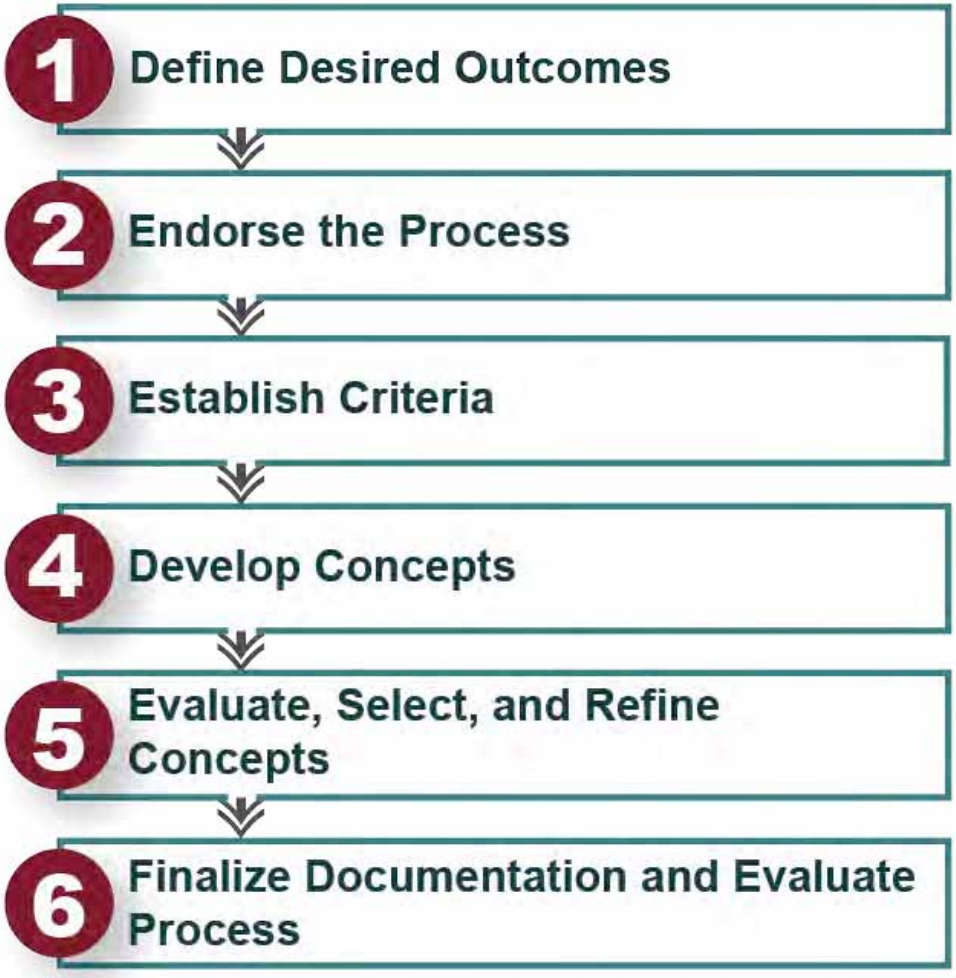
Similar to Eastbound PPSL :

- Minimal widening only as required by corridor foot-by-foot analysis
- Potential minor structure widening
- Potential retaining walls/sound walls
- Replacement of bridges not anticipated
- Design of tolling and ITS infrastructure
- Potential rock-fall mitigation and/or rock cuts
- Resurfacing and restriping



WB I-70 Peak Period
Shoulder Lane

Context Sensitive Solutions (CSS)



WB I-70 Peak Period Shoulder Lane

Schedule

CSS and Concept Development
August 2017 through February 2018

Preliminary/FIR Design
Through February 2018

Final Design
Fall 2018

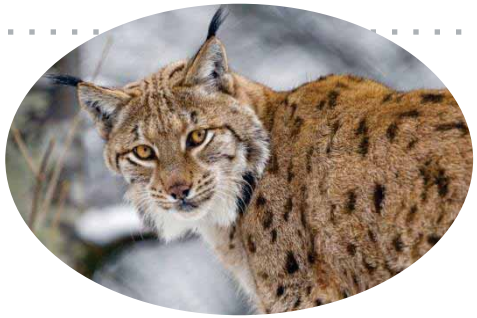
WB I-70 Peak Period Shoulder Lane

NEPA Scope and Schedule

- Anticipated to be Categorical Exclusion
- Need to put dates for:
  - ✓ Purpose and Need
  - ✓ Data Collection
  - ✓ Analysis
  - ✓ Documentation

WB I-70 Peak Period
Shoulder Lane

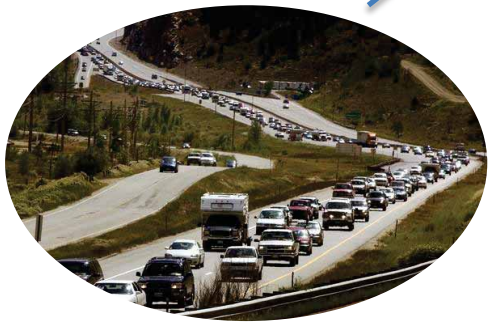
Resource Considerations




WB I-70 Peak Period
Shoulder Lane

Community Resource Considerations



WB I-70 Peak Period Shoulder Lane

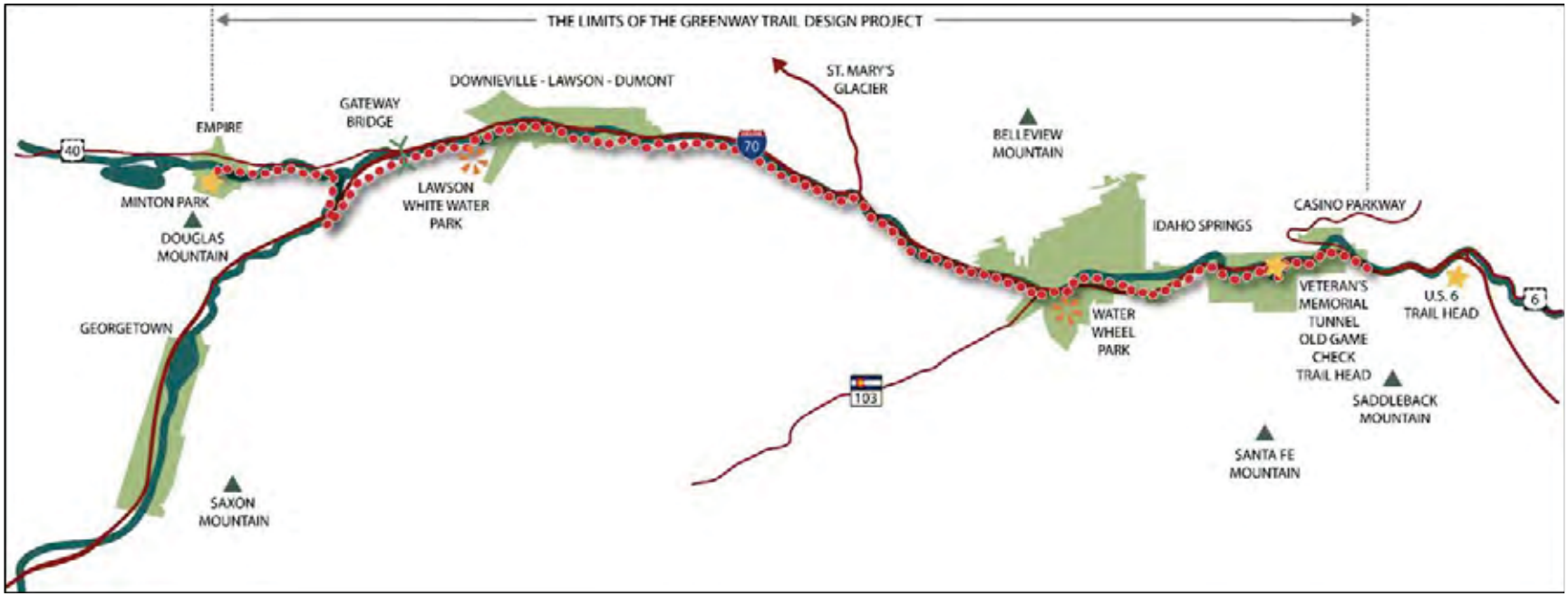
Parks and Recreation Resources/Section 4(f)

- Numerous trails and a few parks but no anticipated impacts
- No additional right-of-way is anticipated
- Section 4(f) temporary occupancy or de minimis finding

WB I-70 Peak Period Shoulder Lane

Bicycle and Pedestrian Facilities

- The project includes a new ped/bike bridge for Fall River Road connecting at Empire Junction
- Most of the trails and parks are adjacent to Clear Creek, including the Greenway Trail so minimal effect is anticipated in the WB direction



WB I-70 Peak Period Shoulder Lane

Cultural Resources/Section 4(f)

- Compliance with the Section 106 Programmatic Agreement.
- Substantial effort surveys in Idaho Springs.
- Potential direct effects in Idaho Springs, Mt Evans Road, Central Colorado RR grade, and Big Five Mine.
- Potential Indirect (visual) adverse effects.
- Anticipating Programmatic Section 4(f)
- Archaeology review is anticipated.

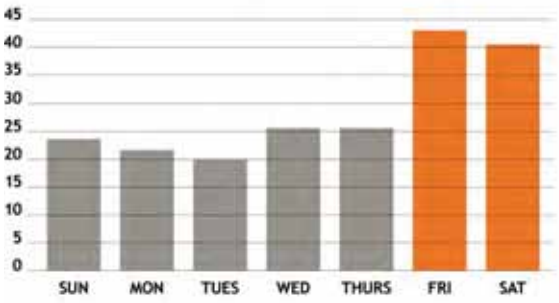
WB I-70 Peak Period Shoulder Lane

Transportation

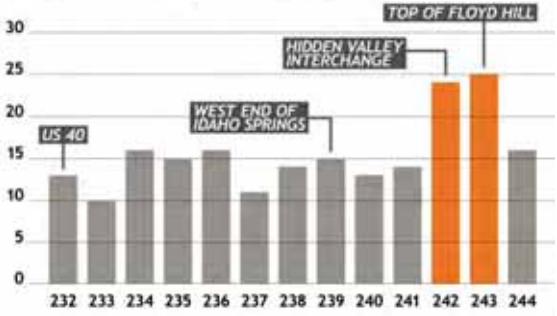
The following analyses will be performed:

- Safety and Level of Service
- Multi-modal/bus, including Bustang
- Review of AGS recommendations
- Travel impacts during construction

CRASHES BY DAY OF THE WEEK



CRASHES BY MILE POST



Westbound crash data is from 2012-2015

WB I-70 Peak Period Shoulder Lane

Noise

- Noise levels in the study area are currently at or above the NAC.
- Type of analysis has not been determined.
- Noise abatement will likely be considered.
- Competing interests between noise mitigation and visual impacts

WB I-70 Peak Period Shoulder Lane

Socioeconomics and Environmental Justice

- Construction Impacts likely to be the biggest issue.
- A business survey will be conducted, opportunity to improve communications with businesses.
- Idaho Springs, Lawson, and Dumont are all low income or minority.
- Potential for both adverse and beneficial impacts

WB I-70 Peak Period Shoulder Lane

Visual and Aesthetics

- Compliance with FHWA Visual Guidelines
- Minimal Effects Anticipated
- Visual Simulations will be prepared

WB I-70 Peak Period Shoulder Lane

Other Community Resources

Brief Analysis anticipated for:

- Air Quality—Project area in attainment
- Cumulative—Reasonably foreseeable projects will include Floyd Hill
- Energy

WB I-70 Peak Period Shoulder Lane

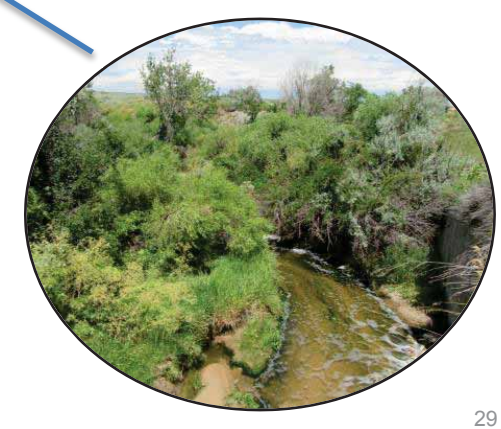
Other Community Resources

Brief Analysis anticipated for:

- Farmlands—Coordination with NRCS will occur
- Hazardous Materials—Mining likely an issue
- Land use
- Paleontological Resources

WB I-70 Peak Period
Shoulder Lane

Natural Resource Considerations



WB I-70 Peak Period Shoulder Lane

Water Resources

- Coordination with SWEEP
- Floodplains
  - Three floodplains are in the study area
  - Clear Creek east of Idaho Springs, Mill Creek and Clear Creek in the Empire Junction area.
- Water Quality
  - The project will incorporate BMPs as necessary.
- Wetlands / Waters of the U.S.
  - Minimal effects are anticipated; possibly only at Empire Junction.

WB I-70 Peak Period Shoulder Lane

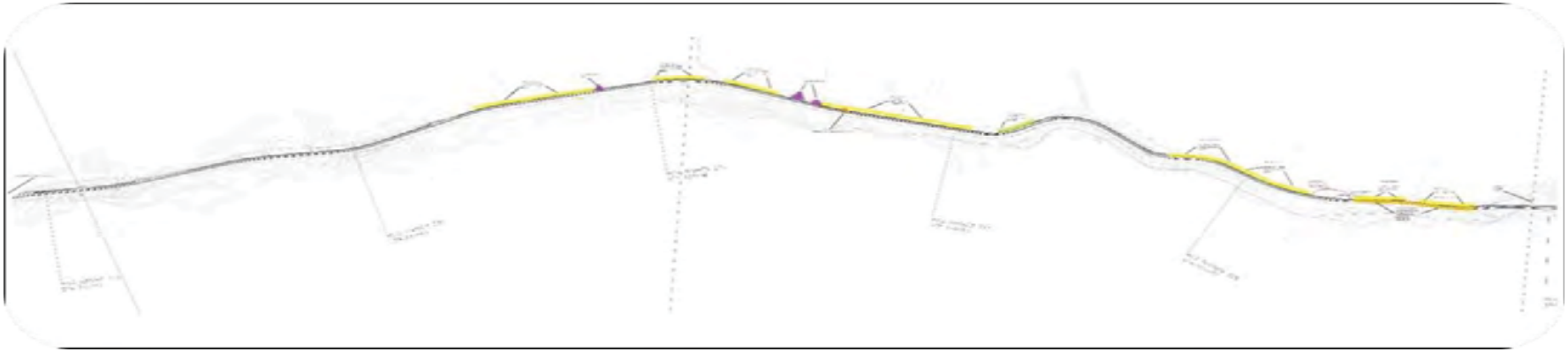
Wildlife/Fisheries Resources

- Compliance with ALIVE
- Threatened and Endangered Species
  - Lynx habitat
  - Other effects to T&E species are likely to be minimal
  - Lighted signage could be a concern
- Wildlife
  - Bighorn sheep habitat
  - Clear Creek is a high value fishery
  - Wildlife crossing

WB I-70 Peak Period Shoulder Lane

Geologic Resources

- Geological testing
- Slope stability
- Rock fall issues
- Mines



WB I-70 Peak Period Shoulder Lane

Additional Natural Resources Considerations

Brief Analysis assumed for:

- Vegetation
- Noxious Weeds

WB I-70 Peak Period Shoulder Lane

Miscellaneous Design Considerations

- Survey/Right-of-Way—Minimal, if any, right-of-way is anticipated
- Permits/Access Control
- Utilities
- Structures
  - Retaining walls
  - Noise walls
- ITS/ ATM/Tolling

WB I-70 Peak Period Shoulder Lane

Public and Stakeholder Outreach

- Extensive Stakeholder coordination will be performed.
- CSS process includes A Project Leadership Team, a Technical Team, Issues Task Forces
- Over 30 small group meetings
- Scoping meeting planned for July 2017 and an additional public meeting to be held.
- Two online public meetings are planned.

WB I-70 Peak Period Shoulder Lane

Next Steps

WB I-70 Peak Period Shoulder Lane

Environmental Scoping Meeting

June 19, 2017, 1:00 PM–2:30 PM

CDOT HQ Shumate Building | Mt Evans A & B Conference Rooms

SIGN-IN SHEET

Attendee	Organization
Kacey Meis	HDR
Wendy Wallach	HDR
Kira Olson	HDR
Arleen Taniwaki	Arland Land Use Economics
Chau T. Nguyen	HDR
Neil Ogden	CDOT
Gina McAfee	HDR
Francesca Tordonato	CDOT R1 Env
Trevor Hartwig	CDOT R1 Env
Nicole Peavey	CDOT HQ
Kelly Larson	FHWA
Dan Jepson	CDOT EPB
Cindy Copeland	CDOT EPB
Lindsay Edgar	CDOT EPB
Kevin Shanks	THK
Jason Longsdorf	HDR
Anthony Jones	FHWA
Stephanie Gibson	FHWA
Sandy Beazley	HDR
David Singer	CDOT
Rose Waldman	CDOT
Cathy Storey	HDR
Julia Kintsch	ECO-resolutions

WB I-70 Peak Period Shoulder Lane

Environmental Scoping Meeting

June 19, 2017, 1:00 PM–2:30 PM

CDOT HQ Shumate Building | Mt Evans A & B Conference Rooms

SIGN-IN SHEET

Attendee	Organization
Josh Giovannetti	R1 WQ
Sabrina Williams	Pinyon
BASIL PYER	CDOT R1
SUSIE HACKETT	R1 WQ / LA
Theresa Santangelo-Dreiling	CDOT
JEFF REAM, ~~APEX DESIGN~~	APEX DESIGN
SHANE BINDER	APEX DESIGN
Vanessa Henderson	CDOT R1

Colorado Department of Transportation
Region 1 West Program
425A Corporate Circle
Golden, CO 80401

Project No: NHPP 0703-445
Project Code: 21893

WB I-70 Peak Period Shoulder Lane

Meeting Minutes

Project:	WB I-70 Peak Period Shoulder Lane CDOT Project NHPP 0703-445 (21893)
Subject:	ALIVE Meeting #1
Date:	August 31, 2017
Location:	CDOT Lookout Mountain Conf Room 425A Corporate Circle, Golden, CO
Attendees:	See attached sign-in sheet
Distribution:	ALIVE committee members, project file
Attachments:	Sign-in sheet, handouts (agenda, presentation, Empire Junction LIZ, ALIVE implementation matrix, ALIVE MOU), I-70 Connectivity Guidelines

Summary of Action Items	Responsibility	Status
1. Revise slide 8 (Fall River Road) of presentation to say: "Approximately spring 2018 for final design/construction" instead of "2017."	HDR	Completed
2. Add "Colorado Boulevard" to the "Other Current Projects" slide 8.	HDR	Completed
3. Check in with John Squires with USFS for lynx data from research study that was completed earlier this year.	Eco Resolutions (Julia Kintsch)	In progress
4. Check whether the lynx crossing report that Sirena has is the same as the John Squires report.	Eco Resolutions (Julia Kintsch) and HDR (Sirena Brownlee)	In progress
5. Ask Scott with CDOT Maintenance for maintenance's observations of the bighorn sheep in the project area, which includes Twin Tunnels.	CDOT (Francesca Tordonato)	Completed, see notes for info
6. Keep suggestion to install cameras on the acceleration lanes at the Empire Interchange (to understand the bighorn sheep movements better) as a potential mitigation in the WB PPSL project or idea for the future ultimate Empire Junction Interchange project.	Eco Resolutions (Julia Kintsch)	In progress
7. Get CPW data on bears.	Eco Resolutions (Julia Kintsch)	In progress
8. Ensure Alison Michael is able to review any existing and new barriers when more information is available (came up in lynx discussion).	Eco Resolutions (Julia Kintsch) and USFWS (Alison Michael)	In progress
9. Check whether adding gravel next to the lane would help keep bighorn sheep away from the highway.	CPW (Brandon Marette)	In progress
10. Look into solutions for deterring bighorn sheep from the highway.	Eco Resolutions (Julia Kintsch)	In progress

Summary of Action Items	Responsibility	Status
11. Get information on bighorn sheep activity/WVCs near Dumont.	CPW (Brandon Marette) and USFS (Doreen Sumerlin)	In progress
12. Follow-up with Joe and Ben (also with CPW) to summarize their behavioral observations of the bighorn sheep near the project area.	CPW (Brandon Marette)	In progress
13. Get information on if there are populations of cutthroat trout in the stretch of the creek at Empire Junction.	CPW (Brandon Marette)	In progress
14. Add mule deer to the updated issue matrix.	Eco Resolutions (Julia Kintsch)	In progress
15. Check telemetry data.	CPW (Brandon Marette)	In progress
16. Keep idea of excluding animals completely from being able to get to the highway as a consideration in project development (this and other projects in the area).	Eco Resolutions (Julia Kintsch) and CDOT (Francesca Tordonato)	In progress
17. Talk to other states about how they deal with similar wildlife issues/mitigation.	Eco Resolutions (Julia Kintsch)	In progress
18. Review rock cut mitigation for wildlife concerns such as raptor entanglement.	Eco Resolutions (Julia Kintsch) and CDOT (Francesca Tordonato)	In progress
19. Schedule next ALIVE meeting and site visit when design information is available.	HDR	In progress
20. Provide copy of I-70 Connectivity Guidelines to the group.	Eco Resolutions (Julia Kintsch)	

SUMMARY OF DISCUSSION:

[Note: action items are in **blue**; decisions/agreements are in **green**.]

1. **Introductions** were made.
2. **ALIVE Committee**
   a. The ALIVE committee was reviewed. Everyone is aware of the PLT, TT, and ITF.
   b. A summary of the ALIVE MOU was reviewed, as well as the 13 linkage interference zones (LIZs). LIZs are known areas of migration and wildlife uses. The intent of ALIVE is focused on these areas and mitigating impacts to wildlife.
3. **WB PPSL Project Overview/Background and Schedule**
   a. The 2016 EB PPSL has been beneficial. Clear Creek County has noted congestion relief on I-70 and frontage roads. The EB PPSL has also improved safety.

b. The Concept Development Process/Visioning (CDP) for WB I-70 from Floyd Hill to Empire Junction has recently been completed. This study has resulted in two projects that have begun the NEPA process: WB PPSL and Floyd Hill.

c. CDR Associates is under a separate contract to facilitate the Context Sensitive Solutions process for this study.

d. The purpose of the I-70 WB PPSL project is to improve westbound highway operations, safety, and travel time reliability, specifically during peak period times (Friday, Saturday, and holidays)—from the Veterans Memorial Tunnels (a.k.a. Twin Tunnels) to US 40 at Empire Junction. Note that this is an interim project and not the permanent/ultimate solution for this area.

e. The scope of the WB PPSL is similar to EB PPSL. The PPSL will be on the inside shoulder. MP 230 is the study area termini on the west end (MP 229 was shown on the slide, but that has been revised).

- Minimal widening only as required by corridor foot-by-foot analysis
- Potential minor structure widening
- Potential retaining walls/sound walls
- Replacement of bridges not anticipated
- Design of tolling and ITS infrastructure
- Potential rock-fall mitigation and/or rock cuts
- Resurfacing and restriping

f. The estimated schedule for the WB PPSL project is:

- 30% design through February 2018.
- NEPA process completion in July 2018.
- Final design, followed by construction, in fall 2018 depending on funding (funding has not yet been identified).

4. **Other Current Projects**

a. Fall River Road Bridge

- A PLT has already been established for this project. The team is currently developing concepts for bike/ped only, bike/ped plus emergency vehicles, and bike/ped/vehicle. Final design followed by construction is slated for approximately spring 2018 (depending on funding).
- A question was raised about how the project is considering wildlife movement at the Fall River interchange and why this bridge is being added. *Response: For EB PPSL, bike access was removed from Fall River Road to Idaho Springs. Because we are doing the same thing on WB, we are mitigating this by adding bike access at a minimum for safe passage of bicycles from the south side to the north side. During the environmental review for the bridge, wildlife movement will be considered.*
- The Fall River Road Bridge project just started. Slide 8 of the presentation should be modified to say “Approximately spring 2018 for final design/construction” instead of “2017.” **Action: Revise slide 8 of presentation.**

b. Floyd Hill

- The Floyd Hill project (I-70 westbound) is from approximately Beaver Brook to the Veterans Memorial Tunnels. The first PLT meeting for this project is scheduled for September 13. ALIVE will be convened for this project towards the end of 2017/beginning of 2018. Final

design followed by construction is slated for approximately spring/summer 2020 depending on funding.

- A question was raised about the duration of the Floyd Hill project construction. *Response: Construction would likely last 2 to 3 years at least*.
- A question was raised about if Julia will be part of the project team for Floyd Hill as well. *Response: Yes, she will be on the project team.*
- USFS commented this is a great example of cumulative effects—three projects at the same time.
- Jo Ann Sorensen suggested adding Colorado Boulevard to this project list. **Action: Add Colorado Boulevard to the project list.**

5. **Project Effects on Wildlife**

a. The primary potential impact would be due to the operation of a third lane since there won't be much expansion of the existing highway footprint (if any in some places and any expansion would be within the existing right-of-way)—mostly because of traffic volume.

b. Animals are usually drawn to highways because of the deicing chemicals (they like the salt).

c. A question was asked if changes in rock slope would have an effect on wildlife. *Response: If the rock slope is sheer, not likely, but it could have a minor effect.*

d. The initial stakeholder concerns from the Westbound Concept Development Process and July 2016 public meeting were discussed.

- The primary concern for bighorn sheep is mortality.
- The project won't preclude wildlife structures that could be part of a future permanent/ultimate solution in this area, especially in the LIZ at Empire Junction.
- We can't address all concerns in the WB PPSL project, but we don't want to exacerbate any existing wildlife issues.
- A question was asked if there's a potential for lynx habitat in this area. *Response: There are mapped potential lynx habitats on both sides, but no critical habitat and no evidence of population in the study area. However, a lynx was spotted up Fall Creek Road at a residence, so it's possible that there could be lynx in the area that are at least moving through.* **Action: Julia will ask John Squires from USFS for lynx data from his recently completed lynx research project that may have data for this area.**

i. USFS noted that for Arapahoe Roosevelt, 9,000-foot elevation is the lowest elevation where lynx are usually found. Note that the 9,000-foot elevation is the lowest elevation used to map lynx habitat on the Arapaho Roosevelt National Forest, but lynx can occur/move/travel below this elevation.

ii. There was a question about whether there was a USFS study that showed there was a lynx population near Loveland Ski Area. *Response: That was part of John Squires' study that came out this year. There was a male and female sighting up there but John Squires was not able to locate them because of a low-snow winter. Plus, there are a lot of people and dogs that use the trail from Bakerville to Loveland now that it's paved and lynx typically stay away from high-use areas like that. Liz (with USFS, worked with John Squires on the research study) tried to trap lynx near there, but there was no evidence, so they've moved their trapping efforts to the areas by Leadville and Copper.*

iii. Telemetry showed that lynx use the Berthoud Pass Lynx linkage area.

iv. A question was asked if they've been seen in the area by Mt. Evans. *Response: There has been use near Guanella Pass, but it was unknown if there is much use near Mt. Evans during the meeting.*

v. Sirena Brownlee (HDR) has a paper that calculated the probability of lynx crossing I-70, but not mapping. It was published this year, so it's likely the same report as the John Squires one discussed earlier. **Action: Confirm that it's the same as the John Squires report.**

6. **I-70 EcoLogical (2011)**

a. A group was formed that reexamined the 2003 LIZs that are referenced in the PEIS and ALIVE MOU. Critics said the 2003 LIZ identification was not done through a standard process. The 2011 EcoLogical project received grants to review the best available data and update the 2003 LIZs. The revised LIZs equaled 16 or 17 compared to the 13 LIZs identified in 2003. Note that not all 13 from 2003 were identified in 2011 as still being LIZs, but most were the same. For example, the Empire Junction LIZ was identified in both 2003 and 2011. However, the Fall River Road LIZ was identified in 2003, but not in 2011. Julia Kintsch thinks it is because the barrier is too large at that location.

b. The ALIVE MOU references the 2003 LIZs, but the most updated data is 2011. It can be confusing and this group could clarify which data set to use on future projects. **Agreement: The group was comfortable using the 2011 LIZs on this project.**

c. A subcommittee of ALIVE developed an implementation matrix in the past. The subcommittee looked at inputs for each of the five life cycles. See attached for handout.

7. **Empire Junction LIZ (MP 231.6–232.9)**

a. The only LIZ in the WB PPSL project area is the Empire Junction LIZ. As noted above, the Fall River Road LIZ was identified in 2003, but not in 2011.

b. USFS asked when the Empire Junction project will be built because there's a lot of bighorn sheep mortality in this LIZ. Clear Creek County noted there are considerations for modifications at this location. CDOT said the Concept Development Process considered multiple options at this interchange, but there will likely be minimal work at this interchange during the WB PPSL project. However, the permanent/ultimate project at this location is a priority after the WB PPSL and Floyd Hill projects.

c. A question was asked about why the right lane is not being used as the PPSL instead of the inside shoulder. *Response: It would be confusing since the EB PPSL is on the inside shoulder.*

d. There is a large bighorn sheep herd at the on- and off-ramps at US 40 on I-70. **Action: Francesca Tordonato (CDOT) will ask CDOT Maintenance for their observations of bighorn sheep in this area.**

Follow-up from Francesca: I spoke with Scott and Steve Alderman with maintenance who is based out of the Berthoud Falls yard.

Scott hasn't seen any sheep since he's been staged out of that area this summer.

According to Steve, he said he has rarely seen any WVCs with sheep and they rarely get hit. He mostly sees them near the intersection of US 40 and the frontage road. They come down off the hill side, cross US 40 and then go to the creek. He said he has never seen them further down the WB ramp to I-70. I have marked the approximate location of where they frequently see them based on my conversation with Steve. See below.

On mainline I-70- he most frequently spots sheep near the chain station on the north side of I-70 near Georgetown Lake - they mainly stay north of the barbed wire ROW fence.

e. The long-term goal is to configure it in the future for connectivity.

f. There was a suggestion to install cameras for acceleration lanes at the Empire Junction interchange to capture bighorn sheep activity to understand how they move in that area. **Action: Keep this as a potential mitigation item as we get further into the project development process or as an idea for the future ultimate Empire project.**

g. The remainder of this project's study area is outsize of the LIZ, although there is room to reduce mortality, but likely not connectivity since it's an interim project. USFS commented that we should talk about any opportunity to help connectivity with new structures; otherwise, it is a lost opportunity even if it is outside of a LIZ.

h. It was noted that the Twin Tunnels improvement project at the east end of the WB PPSL project created a natural wildlife crossing over the top of the tunnels, which has been used by wildlife and isn't in a LIZ.

i. A deer was captured using the bench underneath the Hidden Valley bridge over Clear Creek near the Twin Tunnels project as a ramp during construction. That project graded and leveled the area out so it can be used that way, but the only time an animal was observed using it was during construction. This isn't to say that nothing else has used it, but nobody has been there to witness any other use.

8. **ALIVE Implementation Matrix**

   a. This matrix was developed for the I-70 EcoLogical project in 2011. The group briefly reviewed the matrix.

   b. Considerations made during project development included:

      - Target species movement needs; barriers to movement; opportunities?
      - Changes or potential changes to wildlife habitat or movements?
      - Permeability concerns outside of LIZs?
      - Potentially conflicting mitigation actions?

9. **Previous Improvements**

   a. *Twin Tunnels*—At the box culvert near milepost 242 (approximately 6-foot by 7-foot box culvert), baffles and natural substrate were added for sediment to collect to make it more wildlife-friendly. Improvements were also made at the discharge point, which has a big drop-off to Clear Creek to try to make it easier for wildlife to use and also to reduce the sedimentation into Clear Creek; however, these have eroded. Ungulates would not use it, but smaller fauna use it. A question was raised whether there was any concern about the discharge point drop-off from the culvert and if it should be reconfigured. *Response: Not sure if reconfiguring would add value.*

   Bench improvements were made under the Hidden Valley bridge over Clear Creek as mentioned earlier.

   The barbed wire was removed from existing fencing to make it more wildlife-friendly.

   In addition, upland trees were removed between the tunnels and Clear Creek to detract wildlife from the roadway.

   b. *EB PPSL* (reminder that this was also an interim project)—Placed median gaps for large and small fauna at three locations to help maintain connectivity and reduce wildlife-vehicle collisions. A question was asked if there was monitoring at this location to see use? *Response: No, there was not; visibility would only increase during low-traffic times.*

   The existing chain link fence was removed at Soda Creek Drive and Montana Drive and replaced with wildlife-friendly fence and wildlife barrier fence, respectively.

10. **Wildlife Issues Discussion**

    a. Issue: Wildlife-Vehicle Collisions

       - 0.6 WVC/mile/year (2006-2015) is most current last 10 years of reported accident and carcass data.
       - USFS noted there were two bears at Empire Junction and one east. **Action: Julia Kintsch will get CPW data**.
       - Bears are attracted to the garbage at the Easter Seals Camp. There are a lot of bear sightings in this vicinity.
       - WVC hot spots were reviewed.
         i. There are high deer concentrations at Empire Junction and Twin Tunnels.
         ii. High concentration of deer carcasses have been found at Downieville and Spring Gulch.
         iii. Elk are mostly found on the west side of Empire Junction.
         iv. Bighorn sheep concentrations are mostly at Empire Junction and Twin Tunnels.

- USFS stated bighorn sheep are more present on US 40 than on I-70.

b. Issue: Canada Lynx

- A question was raised if there is connectivity for dispersal movements. *Response: There isn't a lot of data. Walls, traffic, lighting, and medians all discourage lynx.*
- There is no lynx mortality to date.
- A question was raised if we should consider lynx mitigation. Because of barriers, there are limitations for lynx movements. *Response: It's not a high-use area, but USFWS will review existing and new barriers.* **Action: Ensure Alison Michael is able to review any existing and new barriers when more information is available.**

c. Issue: Bighorn Sheep

- The Georgetown herd is used as a source population. There is mortality at US 40 onto I-70 WB and also at off-ramp. There has been some mortality on the west side of Twin Tunnels as well.
- Bighorn sheep are not trying to cross I-70 (north-south), but it would be good to deter them from ramps. They are ultimately trying to cross east-west on the north side of I-70.
- On WB, bighorn sheep are always on the shoulder between Idaho Springs and Dumont on a daily basis. Even though the WB PPSL project isn't adding infrastructure, by adding traffic volumes during peak times, the shoulder the sheep use will go from a 10-foot separation to more of a 4-foot separation. We have to get them out of there; just removing ice salts won't do it. **Agreement: Look into how to deter them from this area.**
- When we did Twin Tunnels and improved the site distance in areas (specifically exiting the tunnels), there was a lot less mortality.
- A question was asked if an at-grade crossing or wildlife detector could be installed at the US 40 ramps. *Response: This would be worrisome because of vehicle speed at this location, with drivers accelerating and checking blind spots. There are many dangerous factors.*
- Would adding gravel next to the lane help deter them from getting so close to the highway? Ben Kraft (CPW) may have ideas on barriers. Could be early action short-term options not precluding future movements. **Action: Brandon Marette (CPW) will look into this**. However, the bighorn sheep would still be attracted to deicers. Julia Kintsch thinks a barrier is needed. **Action: She needs to investigate solutions. Maybe deice closer to their habitat.** A question was asked if barriers would be in site-specific areas. *Response: Yes, at ramps and maybe areas in between*.
- There are a lot of bighorn sheep near Dumont that are on the shoulder (USFS noted they see them when driving from Granby to Idaho Springs). A question was asked if they're in that location only during a certain time of day. *Response: It seems like it's at different times, but will pay more attention when driving through from now on.* **Action: USFS to observe when the sheep are present. CPW will also review their data on that area**.
- Nobody is sure if the bighorns are going down to US 40 for the deicers or if they are going down to get water or grass. CPW thinks that in that area it could be either food or water. **Action: CPW will summarize their behavioral observations at that location (Brandon to follow-up with Joe and Ben)**. **CDOT will also ask Scott with CDOT Maintenance for observations in this area as well as at the Twin Tunnels.**
- Julia Kintsch asked the group for ideas at ramps such as adding barriers; it could be other ramps in the same vicinity. The group noted that a barrier may impede other animals.

d. Issue: Aquatic Connectivity
   - Don't think this project can mitigate for pallid sturgeon and greenback cutthroat trout, but could look at in-stream barriers or culverts that need improvements as part of this project.
   - A question was raised on whether the Empire Junction area is a high-value fishery for cutthroat because Trout Unlimited had mentioned that recently. *Response: Greenback cutthroat trout is located upstream from Clear Creek and above Empire Junction. However, Trout Unlimited had not mentioned if it was the pure greenback or hybrid cutthroat at that area.* Brandon Marette checked with Paul Winkle but they didn't think there was population there, but noted that it is stocked with the hybrid cutthroat trout. **Action: CPW will double-check this.**

e. A question was asked on why there wasn't an issue statement included in the presentation for mule deer. *Response: Because the issue is about mortality, not connectivity; and there's not a high mortality for mule deer. However, they still need to be considered throughout the process.* **Agreement: Include mule deer in the issues table. Action: Add mule deer to the updated issue matrix.**

11. **Potential Improvements for WB PPSL**

a. WB ramp from US 40 onto I-70—install barrier along ramp; signage on either side of barrier.

b. What about mitigation on the west side of Twin Tunnels since that's in the project area?
   - There's already barrier fencing on the north side; there is wildlife fencing so wildlife can access the grassy area for forage.
   - Deer are moving north-south in that area so a barrier there could be a problem. 5 deer have been hit over 10 years by Twin Tunnels. **Action: Brandon will check for telemetry data**.
   - Julia Kintsch reminded the group that reported is less than actual. This stretch probably has higher reported rates especially because of semi trucks.
   - Where does WB start after Twin Tunnels? Maybe add signage before and after Twin Tunnels.

c. What about existing fencing issues, lighting concerns, aquatic permeability, and mitigation needs during construction?
   - We may create temporary fencing to keep wildlife away from blasting or detour.
   - Not aware of any other fence hazards.
   - Maybe punch more holes in the medians similar to EB. Chose three locations with collision rate, but rate is still relatively low.
   - Currently, we have five active lanes. With six active lanes, wildlife might not make it. Note that the thought is that both PPSLs will not be in operation at the same time, so there should still only be five active lanes after this project. A question was raised on when we can get an overpass and/or underpass. *Response: We need funding within these projects to implement these more in LIZs and overpasses/underpasses are more appropriate with an ultimate solution rather than this interim project. However, we can consider making culverts more attractive for the smaller animals with this project.*
   - A question was raised if we should just be done with letting animals get to the road, especially in this section. Should we just add fencing? *Response: Further discussion should occur as projects are developed in this area.* **Action: Keep as consideration in project development (this and other projects in the area).**

- A question was raised about doing peer reviews with other states such as California and Montana to see how they address some of these issues. *Response: In LA, there are 10 lanes and a frontage road that's 150 feet wide. The project will pay $50M for a wildlife bridge.* **Action: Julia will talk to some of her contacts in other states.**
- HDR mentioned that there's been talk of a wildlife bank. *Response: CDOT has an in-lieu fee mitigation fund for lynx. However, there is not much money in it yet and it would have to be mitigation for lynx, which isn't seen as an issue for this project at this time.*
- We can reevaluate the ROD in 2020 and can start looking at ultimate improvements in this section after the reevaluation is complete.
- There is a big potential for mitigation with the Floyd Hill project, which has two LIZs.
- USFS is very worried about the bighorn sheep issues with this project (and future ones).
- It was noted that any rock cuts will have mesh or some sort of mitigation associated with them; need to document it and review for raptor entanglement concerns. Also need to evaluate conflicts. **Action: Review rock cut mitigation for wildlife concerns.**

12. **Next Steps**

    a. Another ALIVE meeting will be schedule to discuss design once we have more information. A site visit will also be scheduled depending on when design information is available. **Action: Schedule next ALIVE meeting and site visit when design information is available.**

Summary of Decision/Agreements Made

1. The group was comfortable using the 2011 LIZs on this project.
2. Look into how to deter bighorn sheep from the roadway shoulder on WB I-70 between Idaho Springs and Dumont.
3. Include mule deer in the issues table.

WB I-70 Peak Period Shoulder Lane

SIGN-IN SHEET

ALIVE ISSUES TASK FORCE MEETING

August 31, 2017, 1:00–3:30
CDOT Golden Lookout Mountain Conf Room

ATTENDED	NAME	AGENCY	E-MAIL ADDRESS
X	Alison Michael	USFWS	alison_michael@fws.gov
X	Brandon Marette	CPW	brandon.marette@state.co.us
	Carol Kruse	USFS	ckruse@fs.fed.us
X	Doreen Sumerlin	USFS	dsumerlin@fs.fed.us
X	Francesca Tordonato	CDOT	francesca.tordonato@state.co.us
X	Jo Ann Sorensen	Clear Creek County	jsorensen@co.clear-creek.co.us
	Joe Walter	CPW	joseph.walter@state.co.us
X	Julia Kintsch	Eco Resolutions	julia@eco-resolutions.com
X	Kelly Larson	FHWA	kelly.larson@dot.gov
X	Neil Ogden	CDOT	neil.ogden@state.co.us
X	Sirena Brownlee	HDR	sirena.brownlee@hdrinc.com
	Stephanie Gibson	FHWA	stephanie.gibson@dot.gov
X	Vanessa Henderson	CDOT	vanessa.henderson@state.co.us
X	Wendy Wallach	HDR	wendy.wallach@hdrinc.com

WB I-70 Peak Period Shoulder Lane

ALIVE ISSUES TASK FORCE MEETING

August 31, 2017, 1:00–3:30
CDOT Lookout Mountain Conf Room
425A Corporate Circle, Golden, CO

AGENDA

1. **Introductions ..... Vanessa Henderson**
2. **ALIVE Committee ..... Vanessa Henderson**
   a. Background/purpose of group
3. **WB PPSL Project Overview ..... Vanessa Henderson**
   a. Project background
   b. Project purpose and scope
   c. Schedule
4. **Other Current Projects ..... Vanessa Henderson**
   a. Fall River Road Bridge
   b. Floyd Hill
5. **Project Impacts to Wildlife**
   a. Preliminary list of stakeholder concerns
6. **Existing Resources ..... Julia Kintsch**
   a. A Regional Ecosystem Framework for Terrestrial and Aquatic Wildlife along the I-70 Mountain Corridor in Colorado
      - LIZ locations within the project and recommended mitigations
         i. Empire Junction (MP 231.6 to 232.9)

   b. Guidelines for Improving Connectivity for Terrestrial and Aquatic Wildlife on the I-70 Mountain Corridor
   c. Implementation matrix
7. **Implementation Process ..... Julia Kintsch**
   a. Initial list of issues
   b. Identification of information and data needs
   c. Initial recommendations
8. **Other Topics/Questions ..... Vanessa Henderson**
9. **Next Steps ..... Vanessa Henderson**
   a. Action items
   b. Next meeting

WB I-70 Peak Period Shoulder Lane

CDOT Project NHPP 0703-445
Subaccount 21893

ALIVE Meeting

August 31, 2017

WB I-70 Peak Period Shoulder Lane

ALIVE Committee

- The I-70 Mountain Corridor creates a barrier to wildlife movement and results in wildlife mortality.
- Lead agencies formed a working group to address these issues through “A Landscape Level Inventory of Valued Ecosystem Components” (ALIVE).
- The committee identified 13 Linkage Interference Zones (LIZ); these are known areas of migration and wildlife uses. Intent of this group is focused on these areas and mitigating impacts to wildlife.
- The ALIVE MOU (April 2008) details responsibilities of agencies in addressing wildlife-vehicle collisions (WVCs) and restoring connectivity (i.e., mitigation).
- This allows for holistic consultation and documentation by streamlining this process for all projects along the corridor.

WB I-70 Peak Period Shoulder Lane

Project Background

2016

Eastbound Mountain Express Lanes (EB MEXL) completed

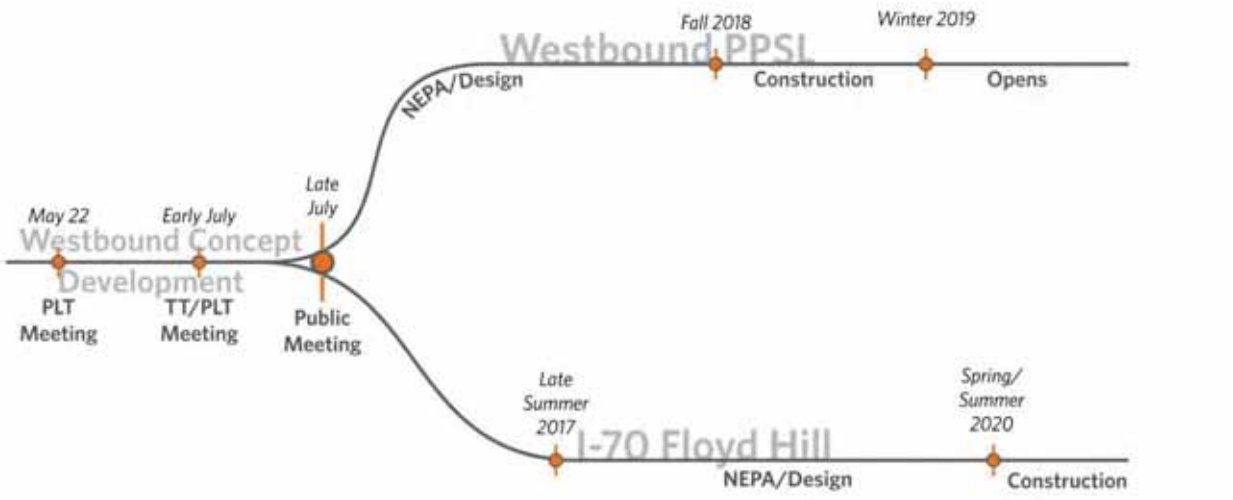
2017

I-70 Concept Development Process/Visioning (anticipated completion: July/August 2017)

Context Sensitive Solutions

CDR (under separate contract)

Westbound I-70 Concept Development Process Transition to NEPA



WB I-70 Peak Period Shoulder Lane

Purpose

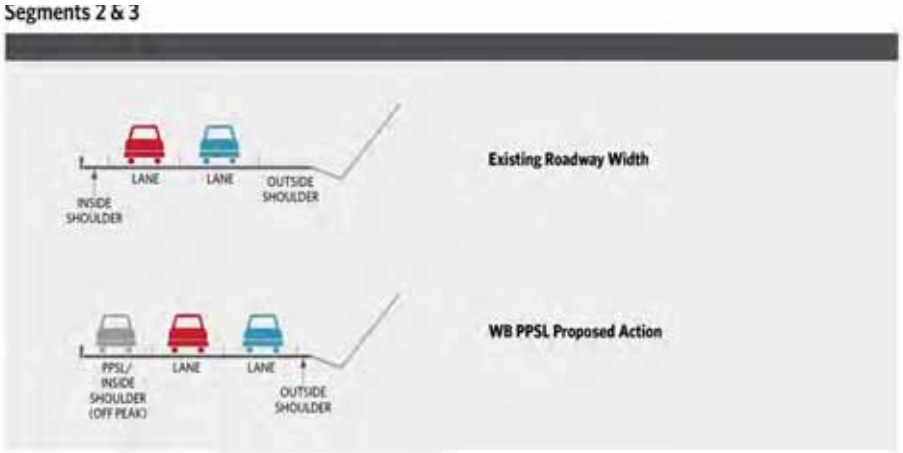
The purpose of the I-70 Westbound Peak Period Shoulder Lane project is to improve westbound highway operations, safety, and travel time reliability, specifically during peak period times—from the Veterans Memorial Tunnels (aka, Twin Tunnels) to US 40 at Empire Junction.

WB I-70 Peak Period Shoulder Lane

Scope

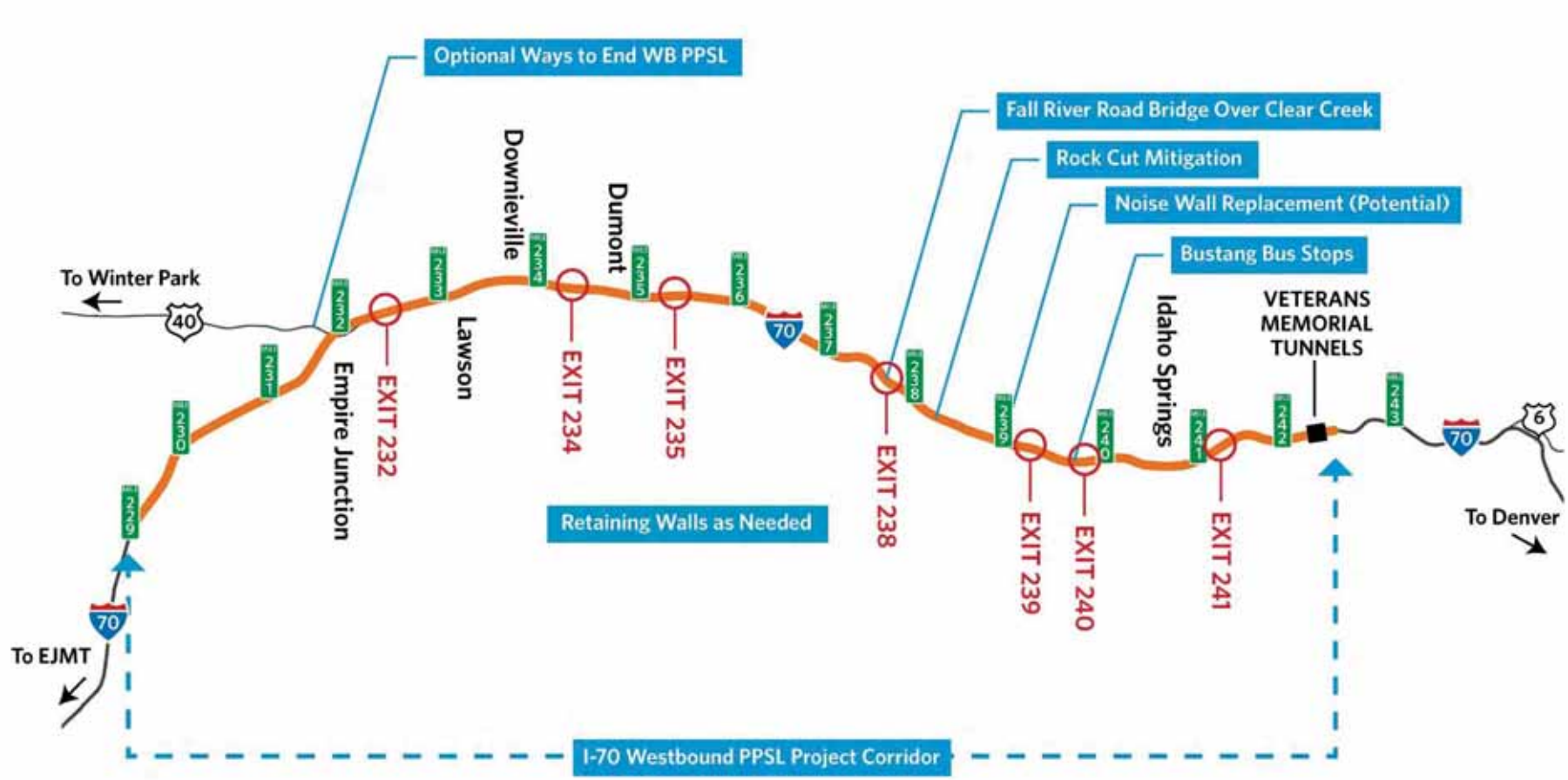
Similar to Eastbound PPSL :

- Minimal widening only as required by corridor foot-by-foot analysis
- Potential minor structure widening
- Potential retaining walls/sound walls
- Replacement of bridges not anticipated
- Design of tolling and ITS infrastructure
- Potential rock-fall mitigation and/or rock cuts
- Resurfacing and restriping



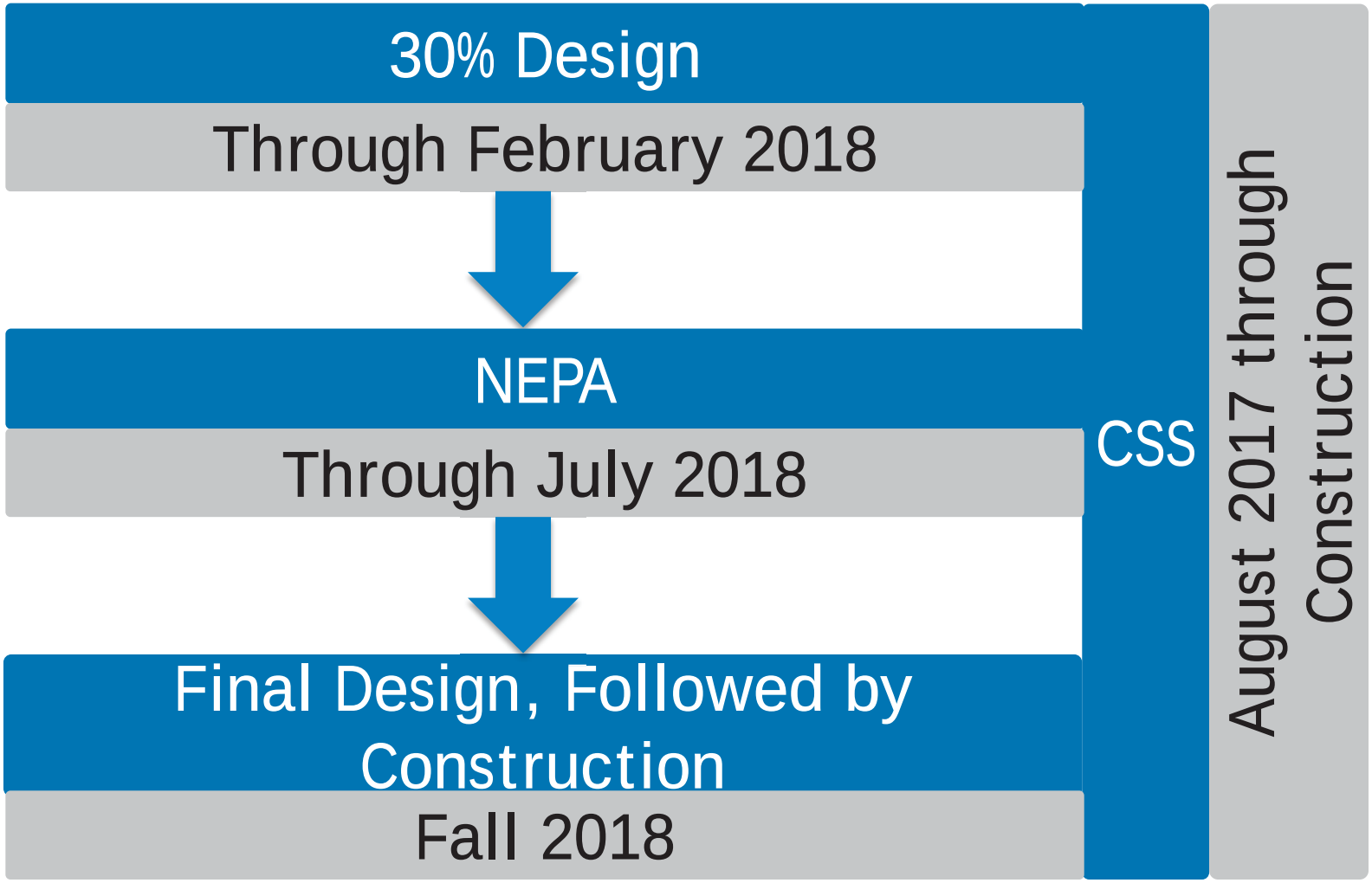
WB I-70 Peak Period Shoulder Lane

Scope (Continued)



WB I-70 Peak Period Shoulder Lane

Schedule



WB I-70 Peak Period Shoulder Lane

Other Current Projects

- Fall River Road Bridge
  - PLT established
  - Developing concepts: bike/ped only, bike/ped plus emergency vehicles, and bike/ped/vehicle
  - Approximately Spring 2018 for final design/construction
- Floyd Hill
  - I-70 westbound from approximately Beaver Brook to the Veterans Memorial Tunnels
  - 1st PLT meeting: September 13
  - Will convene ALIVE towards end of 2017/beginning of 2018
  - Final design followed by construction in approximately Spring/Summer 2020
- Colorado Boulevard
  - West end complete and east end under construction

WB I-70 Peak Period Shoulder Lane

Project's Effects on Wildlife

- Increase in barrier effect:
  - 3 traffic lanes during select times (Friday-Monday, Holidays)
  - Increasing traffic volumes during operation
  - Retaining walls, median and shoulder barriers (increase in height or locations)
  - Lighting at interchanges and signs
- Potential increase in wildlife-vehicle collisions
- Potential minor increases in highway footprint within right-of-way

WB I-70 Peak Period Shoulder Lane

Initial Stakeholder Concerns

- Threatened and Endangered Species
  - Lynx habitat
  - Other effects to T&E species are likely to be minimal
- Bighorn sheep mortality and connectivity
- Wildlife crossings
  - Don’t preclude future wildlife passages
- Reduce wildlife-vehicle collisions
- Clear Creek is a high value fishery
  - Improve fish passage and reduce channelization

WB I-70 Peak Period Shoulder Lane

I-70 EcoLogical

- *A Regional Ecosystem Framework for Terrestrial and Aquatic Wildlife along the I-70 Mountain Corridor*
  - Identification of Linkage Interference Zones (2011)
  - ALIVE Implementation Matrix

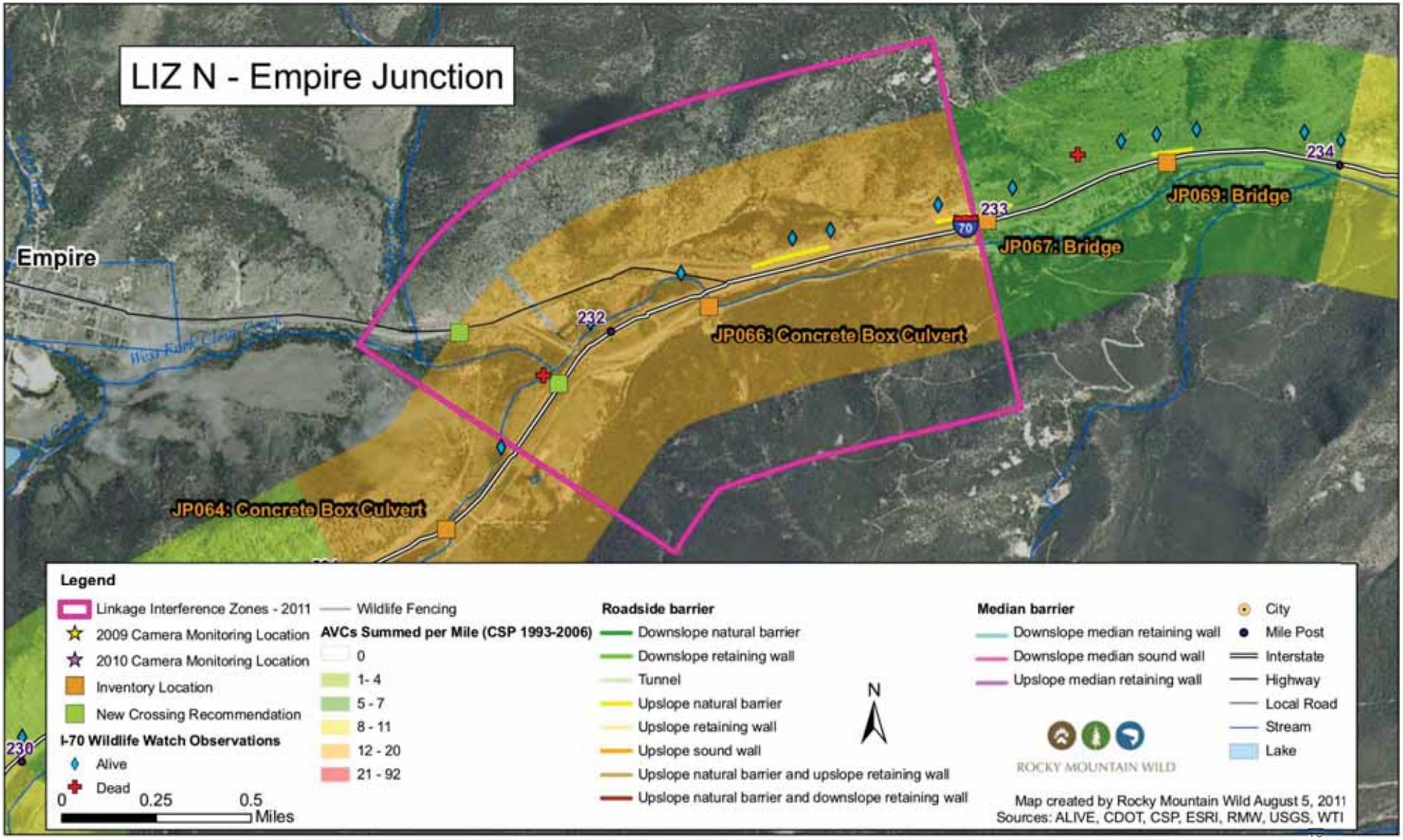
- *Guidelines for Improving Connectivity for Terrestrial and Aquatic Wildlife in the I-70 Mountain Corridor*

WB I-70 Peak Period Shoulder Lane

Empire Junction LIZ (MP 231.6 - 232.9)

- Canada lynx, also bighorn sheep, black bear, elk, mule deer, northern leopard frog
- WVC rate is high
- Mitigation recommendations:
  - Long-term, reconfigure interchange and integrate large wildlife crossing to accommodate terrestrial and aquatic passage, including a bighorn sheep overpass across US 40.
  - Install barriers along north side of I-70 to keep bighorn sheep from roadway.

WB I-70 Peak Period Shoulder Lane



WB I-70 Peak Period Shoulder Lane

ALIVE Implementation Matrix

- Developed for I-70 EcoLogical project

- Considerations during project development:
  - Target species movement needs; barriers to movement; opportunities?
  - Changes or potential changes to wildlife habitat or movements?
  - Permeability concerns outside of LIZs?
  - Potentially conflicting mitigation actions?

WB I-70 Peak Period Shoulder Lane

Previous Improvements

- Twin Tunnels
  - Box culvert west of TT (MP 242)
    - Added baffles and natural substrate
    - Filled in drop-off at discharge point
    - Use?

WB I-70 Peak Period Shoulder Lane

Previous Improvements

- Twin Tunnels
  - West of TT to Clear Creek
    - Removed upland trees to detract wildlife from roadway
  - Hidden Valley bridge over Clear Creek
    - Improved bench under bridge and approaches
    - Use?
  - Mitigation for temporary construction impacts

WB I-70 Peak Period Shoulder Lane

Previous Improvements

- EB PPSL
  - Made medians crossable by placing median gaps for large & small fauna at 3 locations to help maintain connectivity and reduce WVC.

WB I-70 Peak Period Shoulder Lane

Previous Improvements

- EB PPSL
  - Removed existing chain link fence:
    - At Soda Creek Drive, replaced with wildlife friendly fence
    - At Montane Drive, replaced with wildlife barrier fence

WB I-70 Peak Period Shoulder Lane

Wildlife Issues Discussion

- Identify:
  - Initial list of issues and concerns
  - Information and data needs
  - Initial mitigation recommendations

WB I-70 Peak Period Shoulder Lane

Wildlife Issues Discussion

- Identify:
  - Initial list of issues and concerns
  - Information and data needs
  - Initial mitigation recommendations

WB I-70 Peak Period Shoulder Lane

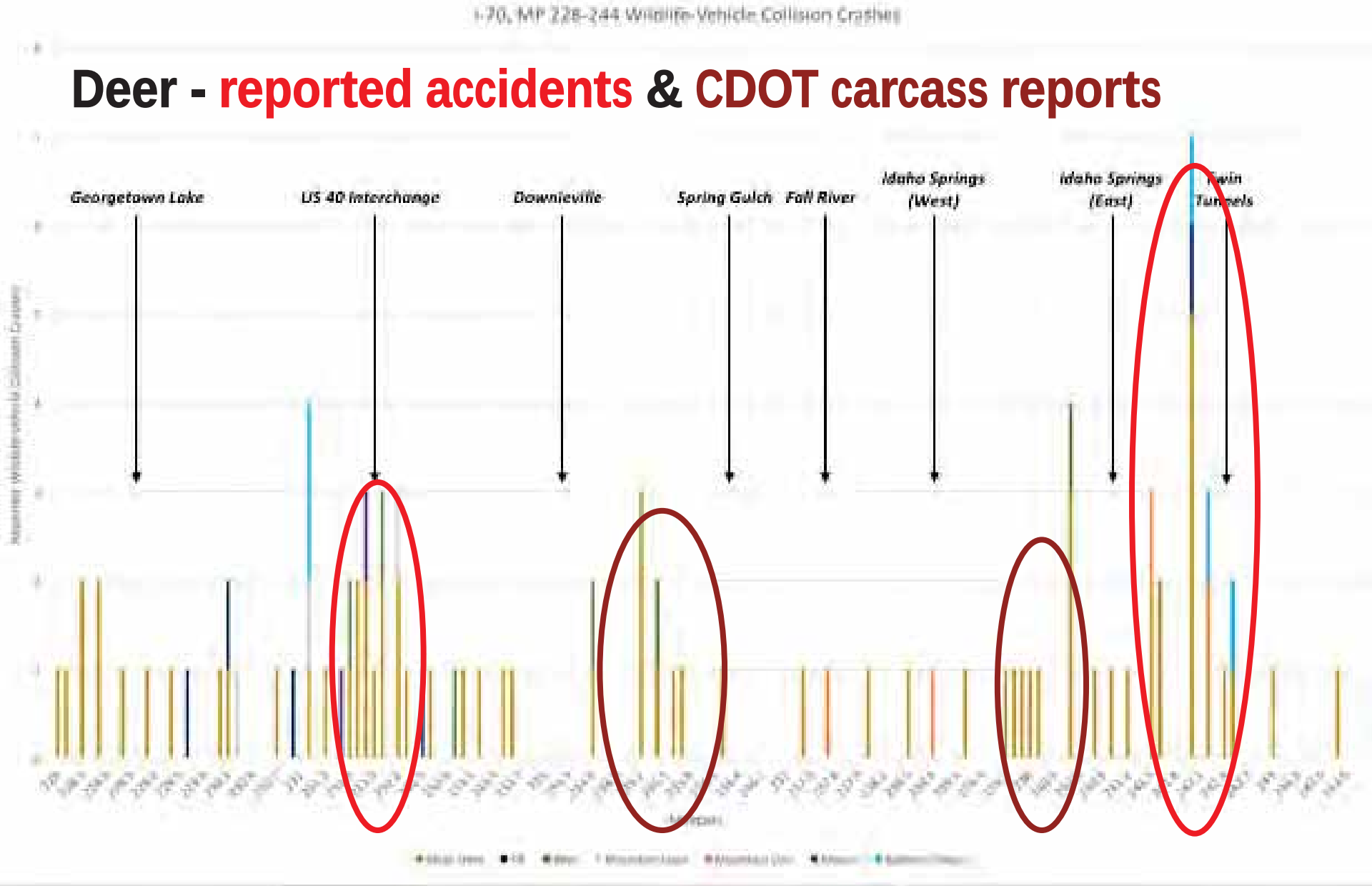
Issue: Wildlife-Vehicle Collisions

- 0.6 WVC/mile/year (2006-2015)

- Primarily mule deer; also bear, bighorn sheep, elk, mountain lion, mountain goat, moose

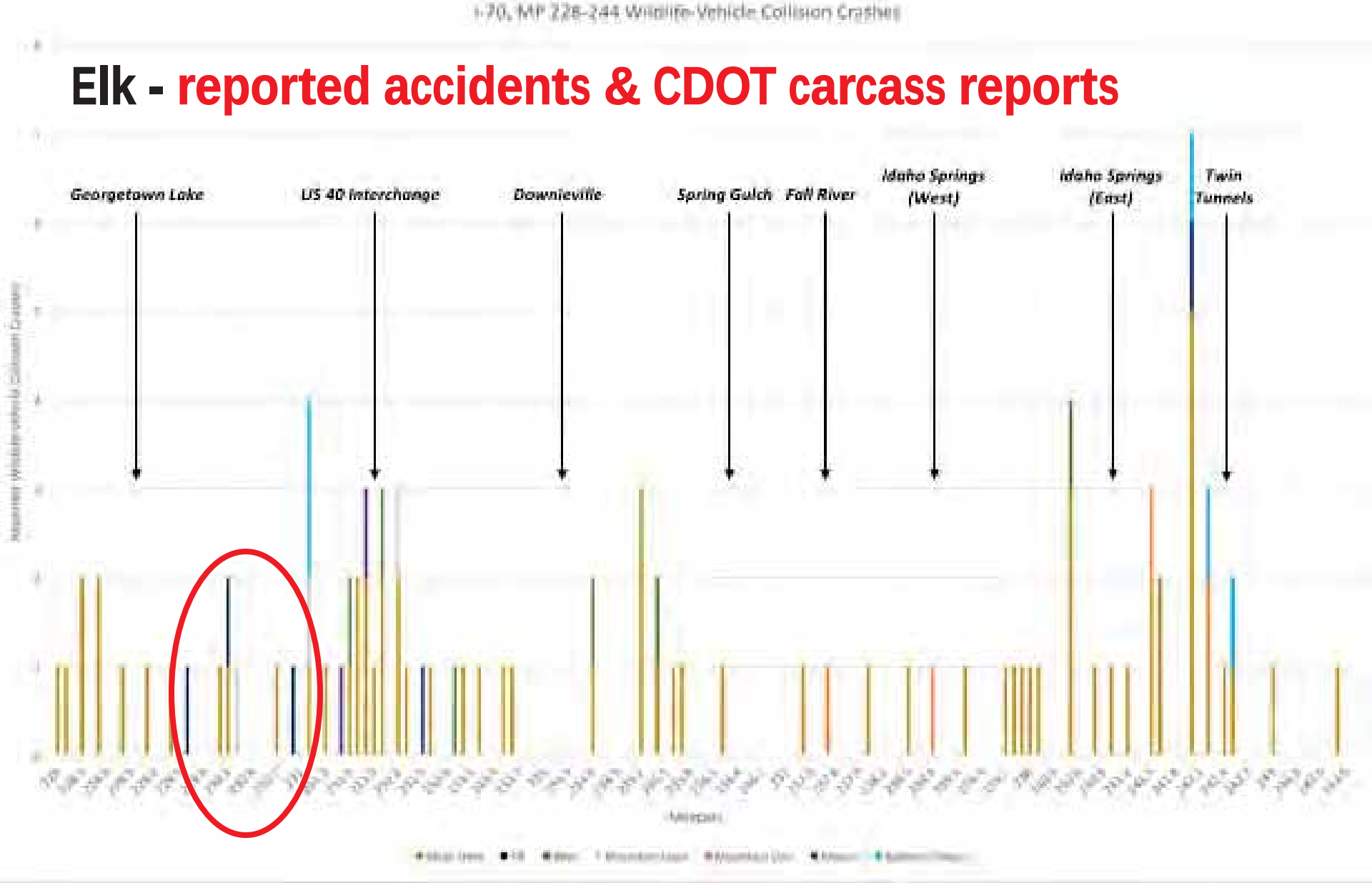
WB I-70 Peak Period Shoulder Lane

Deer - reported accidents & CDOT carcass reports



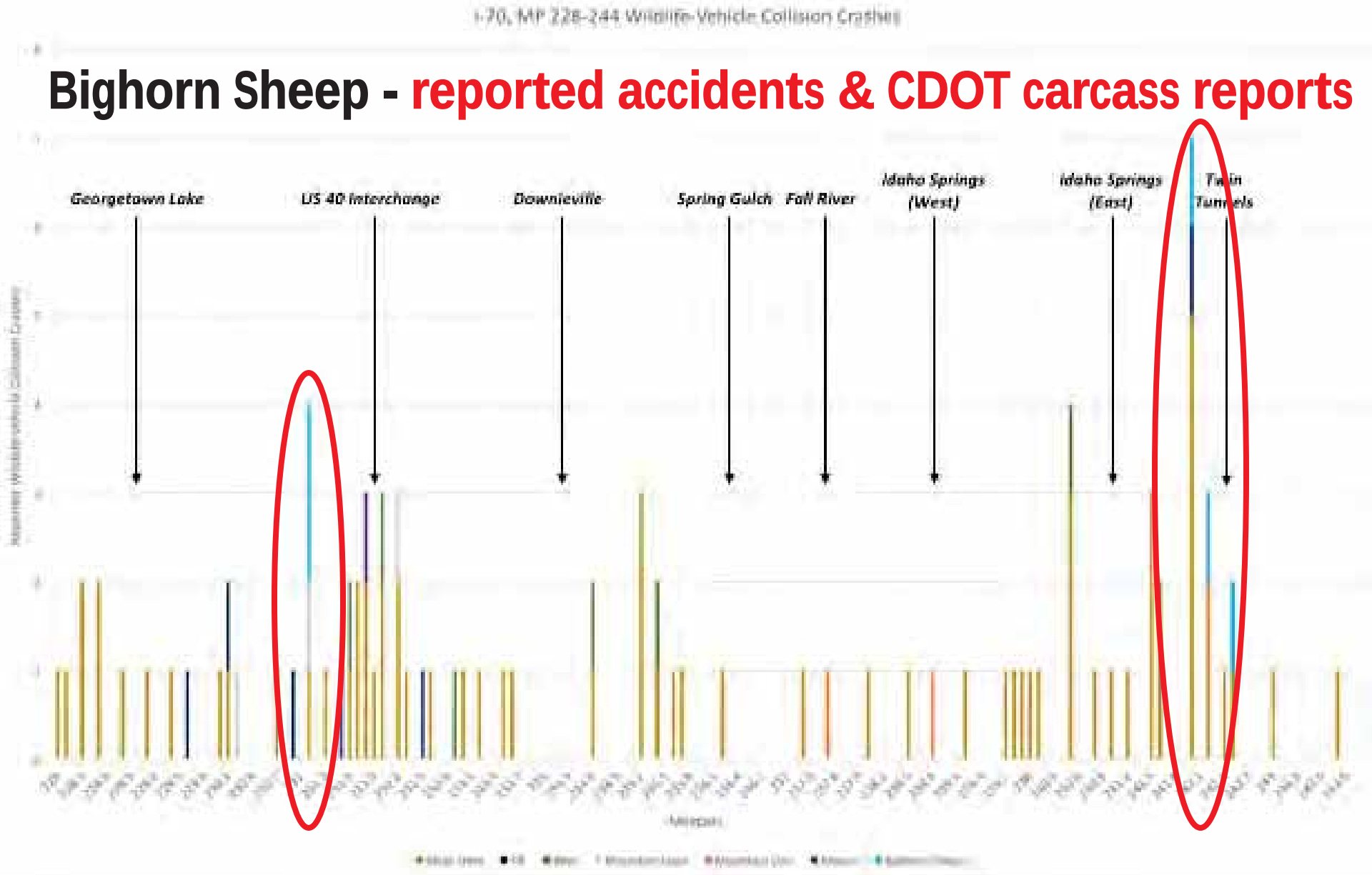
WB I-70 Peak Period Shoulder Lane

Elk - reported accidents & CDOT carcass reports



WB I-70 Peak Period Shoulder Lane

Bighorn Sheep - reported accidents & CDOT carcass reports



WB I-70 Peak Period Shoulder Lane

Issue: Canada Lynx

- Connectivity
  - Retaining walls, median & shoulder barriers
  - Traffic volume barrier
  - Lighting (primarily at interchanges) & lighted signs

Credit: Rocky Mountain Wild

WB I-70 Peak Period Shoulder Lane

Issue: Bighorn Sheep

- Value of Georgetown Herd for hunting, wildlife viewing and as source population.

- Mortality due to WVC
  - Primary source of mortality for this herd
  - Hotspots:
    - West side of Twin Tunnels (average 1 WVC/year)
    - US 40 interchange (especially WB on ramp)
  - De-icing minerals as attractant to roadway

WB I-70 Peak Period Shoulder Lane

Issue: Aquatic Connectivity

- Fish passage
  - South Platte species

- Stream channeling
  - Conflicts with rafting interests?

WB I-70 Peak Period Shoulder Lane

Potential Improvements for WB PPSL

- WB ramp from US 40 onto I-70
  - Install barrier along ramp
    - E.g., barrier fencing or jersey barrier; complement with unpalatable vegetation
    - Extent?
  - Signage on either side of barrier

WB I-70 Peak Period Shoulder Lane

Potential Improvements for WB PPSL

- West side of Twin Tunnels
  - Mitigation needs and opportunities?

- Pathways through existing structures
  - Bridge at MP 241.9, west of Twin Tunnels
    - Bench on east side of creek, but doesn't lead anywhere to south
    - Dirt road on west side of creek

WB I-70 Peak Period Shoulder Lane

Potential Improvements for WB PPSL

- Existing fencing issues?
- Lighting concerns?
- Aquatic permeability
- Mitigation needs during construction
  - Temporary fencing to keep wildlife away from blasting or detour

WB I-70 Peak Period Shoulder Lane

Other topics or questions?

WB I-70 Peak Period Shoulder Lane

Next Steps

- Action Items

- Next ALIVE meeting?
  - ALIVE site visit?

LIZ N: Empire Junction

LIZ N: Empire Junction

Mileposts: 231.6 – 232.9 *Early Enhancement Opportunities in LIZ?* No
LIZ Length: 1.4 miles

Target Species	*Species Movement Guilds*
Canada Lynx	Adaptive High Mobility Fauna

Secondary Target Species

Bighorn Sheep*	Black Bear
Elk	Mule Deer
Northern Leopard Frog	

*East-west movement across Highway 40 is more important for Bighorn sheep than connectivity across I-70.

Animal-Vehicle Collisions: High

Status of Adjacent Lands: Mostly private, some county

Site Discussion: Confluence of two large drainages (Clear Creek and the West Fork) and junction with Highway 40. Likely these two drainages provided historical movement pathways for many species. Interchange and other infrastructure create a large barrier at this confluence. Clear Creek has forced meanders around highway infrastructure, reinforced by riprap banks throughout this segment

Connectivity Recommendations

Coordinate visioning and planning for this segment with visioning and planning for Highway 40. Preferred alternative is to construct an extensive span bridge and raised interchange through this section to accommodate terrestrial and aquatic passage between the two drainages and restore the flow of Clear Creek and its riparian banks to a more natural condition. Alternatively, construct new crossing structures at mileposts 231.2 (JP064 - just beyond west end of LIZ) and 231.6-231.9. Investigate using jersey barriers or other barrier structures to keep sheep away from I-70 road edge on north side (2004 LIZ recommendation).

Site-Specific Recommendations				
Loc. #	**MP**	**Site Description**	**Recommendations**	**EEO***
JP064	231.2	Clear Creek concrete box culvert. Outside of LIZ, but possible location for a larger crossing structure.	Replace with a bridge structure and restore riparian banks. Bridge should have a wide enough span to include dry pathways for terrestrial species on both sides of the creek. Install limited guide fencing to direct animals towards structure and investigate use of scent lures to attract lynx towards structure.	No

JP066	232.3	Clear Creek concrete box culvert. Structure goes under traffic lanes and eastbound on-ramp.	None. See preferred alternative.	No
n/a	231.6-231.9	No existing structure	Identify a location to install a new large arch culvert in this segment suitable for lynx, elk, deer and bear. Install limited guide fencing to direct animals towards structure and investigate use of scent lures to attract lynx towards structure.	No
n/a	Hwy 40	No existing structure	Identify a location and construct an overpass for bighorn sheep over Hwy 40 (2004 LIZ recommendation)	No

*Early Enhancement Opportunity

†Indicates wildlife monitoring conducted at site

ALIVE IMPLEMENTATION MATRIX

WILDLIFE CONNECTIVITY AND HABITAT

Objective: To increase the permeability of the I-70 Corridor to terrestrial and aquatic species, including the development of management strategies that will result in the long-term protection and restoration of wildlife linkage areas that intersect the I-70 Corridor, improve habitat connectivity, and preserve essential ecosystem components. (MOU Purpose and Intent).

Corridor Planning	Project Development	Project Design	Project Construction	Operations, Maintenance, and Monitoring
Inputs • Wildlife data • Land use information (incl. local use, USFS management plans, BLM, etc.) • Existing LIZ and Ecological information and recommendations	Inputs • Target species movements and habitats • Wildlife guidelines and BMPs (I-70 Guidelines for Enhancing Wildlife Permeability) • Avoidance and mitigation strategies (I-70 Connectivity Recommendations) • Existing recovery efforts (USFWS/CDOW) • Coordination with CDOW, USFWS, USFS, BLM, local governments, other stakeholders)	Inputs • Species specific needs and compatible project designs • Terms and conditions from Biological Opinion, if applicable	Inputs • Terms and conditions from Biological Opinion, if applicable • New species & habitat data since PS&E relative to all target species (or new target species) – NEPA reevaluation	Inputs • Implementation and Monitoring Plan • Terms and conditions from Biological Opinion, if applicable
Considerations • What opportunities exist to improve, protect or restore permeability and habitat components? • How have wildlife habitat and populations changed since the original or last updated analyses?	Considerations • Are these permeability concerns outside of identified LIZs? • Where are there existing barriers to wildlife movement? • What opportunities exist to improve, protect or restore permeability and habitat components?	Considerations • Will project designs improve or restore habitat and permeability? • Will project designs minimize impacts to habitat and permeability during construction?	Considerations • Are there unforeseen issues affecting habitat & permeability during construction? • Are there changes to the construction timeline that could affect habitat & permeability?	Considerations • Are the mitigations successful relative to the permeability goals set during corridor planning and project development? – What could be done differently?

ALIVE IMPLEMENTATION MATRIX

WILDLIFE CONNECTIVITY AND HABITAT

Objective: To increase the permeability of the I-70 Corridor to terrestrial and aquatic species, including the development of management strategies that will result in the long-term protection and restoration of wildlife linkage areas that intersect the I-70 Corridor, improve habitat connectivity, and preserve essential ecosystem components. (MOU Purpose and Intent).

Corridor Planning	Project Development	Project Design	Project Construction	Operations, Maintenance, and Monitoring
Considerations (cont'd) • What types of changes in wildlife habitat, populations or movements might occur in the reasonably foreseeable future?	Considerations (cont'd) • How have wildlife habitat and populations changed since the original or last updated analyses? • What types of changes in wildlife habitat, populations or movements might occur in the reasonably foreseeable future? • Do opportunities exist to enhance recovery efforts (e.g., approved Recovery Plans for ESA-listed species and State analog)? • Does the target species list include ESA-listed T&E species, species of state economic importance, USFS and BLM sensitive species, USFS MIS, & state spp. of concern> • Are there potentially conflicting mitigation/ BMPs actions (crosswalk proposed mitigations)	Considerations (cont'd) • Will project designs minimize impacts to habitat and permeability during operations and maintenance? • Are there potentially conflicting mitigation/BMPs actions (crosswalk proposed mitigations)		Considerations (cont'd) – How could a structure be built better, cheaper next time?

ALIVE IMPLEMENTATION MATRIX

WILDLIFE CONNECTIVITY AND HABITAT

Objective: To increase the permeability of the I-70 Corridor to terrestrial and aquatic species, including the development of management strategies that will result in the long-term protection and restoration of wildlife linkage areas that intersect the I-70 Corridor, improve habitat connectivity, and preserve essential ecosystem components. (MOU Purpose and Intent).

Corridor Planning	Project Development	Project Design	Project Construction	Operations, Maintenance, and Monitoring
Outcomes and Products • Identify measurable permeability goals for the corridor • Avoidance strategies Mitigation strategies (I-70 Connectivity Recommendations) • Revised or refined LIZ information for that corridor segment (LIZs-2011) • Identify partnership and acquisition or easement opportunities (permanent protection opportunities for adjacent habitat)	Outcomes and Products • Biological Evaluation (USFS sensitive spp.), Biological Assessment (USFS), Biological Opinion (USFWS), Biological Report (USFS) – Identify project-specific mitigation strategies relative to all target species – Establish commitment to monitoring	Outcomes and Products • Final Plan Specifications and Estimates (i.e., final designs) including specific mitigation measures • Monitoring plan, estimates and identified funding for monitoring & ongoing maintenance	Outcomes and Products • Mitigation modifications	Outcomes and Products • Monitoring results • Lessons learned

INFORMATION NEEDS AND UPDATES

Objective: Identify and acquire information needed to inform decision-making and outcomes at each life cycle phase.

• Changing and shifting habitats and wildlife populations • Ongoing LIZ revisions	• General and species-specific BMPs	• Species-specific and site-specific monitoring needs-what protocols should be implemented to evaluate the functionality of mitigation measures?	• Surveys prior to implementation	• Are there new or improved monitoring techniques which could provide greater efficiency and effectiveness in monitoring?

FS Agreement No. 08-MU-11021000-013
Cooperator Tax ID No. _____
Cooperator Agreement No. _____

ALIVE
Memorandum of Understanding
among the
Colorado Department of Transportation
Federal Highway Administration
US Fish and Wildlife Service
The USDA Forest Service
US Bureau of Land Management
Colorado Department of Natural Resources, Division of Wildlife

This Memorandum of Understanding (MOU) is made and entered into this 11th_day of _April, 2008, between the Colorado Department of Transportation (CDOT), the Federal Highway Administration (FHWA), the US Fish and Wildlife Service (USFWS), the USDA Forest Service (USFS), the US Bureau of Land Management (BLM), and the Colorado Department of Natural Resources, Colorado Division of Wildlife (CDOW), hereinafter referred to as "Parties" or "Agencies."

The Parties to this agreement are public entities with responsibilities pertaining to the I-70 Mountain Corridor (I-70 Corridor) Tier I Programmatic Environmental Impact Statement (PEIS) and Tier II (site-specific, project-level) National Environmental Policy Act (NEPA) documents.

The PEIS recognizes that the existing I-70 Corridor and the proposed future improvements pass through several life zones and ecosystems that support numerous aquatic and terrestrial wildlife species. While all Parties to this MOU recognize that the I-70 transportation system provides important benefits to Colorado citizens, the local communities, and economic interests on a statewide level, they also acknowledge that the I-70 Corridor fragments or isolates existing habitats, interferes with free movement of animals within their habitat, and reduces remaining quality wildlife habitat by making such habitat less accessible to many native species. In addition, high-traffic volumes form a difficult-to-penetrate barrier to movement, often resulting in animal-vehicle collisions and serious levels of mortality for some rare or low-density species. Therefore, over time, the benefits derived from a transportation system can come at a cost to other resources, including interference with the ability of wildlife to use the landscape in a manner that maintains population effectiveness.

The Parties to this agreement desire to improve conditions for wildlife in this Corridor. To meet that need, CDOT convened the ALIVE Committee, a technical advisory committee consisting of biologists from each of this MOU's signatory government agencies. The **ALIVE Committee** ("**A L**andscape Level **I**nventory of **V**alued **E**cosystem Components") has developed a landscape-based ecosystem approach for consideration of wildlife needs and conservation measures, and has identified measures to improve existing aquatic and terrestrial ecosystem connectivity across the I-70 Corridor between Denver and Glenwood Springs.

Using best available information, the ALIVE Committee identified 13 high-priority locations where evidence suggests that the highway's barrier effect impedes important wildlife migration or movement routes or zones of dispersal. The PEIS and this MOU refer to these locations as linkage interference zones (LIZs). The 13 LIZs are described on Table 1 and shown on Figure 1, both appended to and made a part of this MOU. The ALIVE program provides a starting point for, and ensures Agencies' participation in development of, subsequent Tier II site-specific analyses and implementation of long-term impact mitigation measures within the context of a Corridor-long, landscape-based ecosystem approach to Corridor impacts on wildlife needs and conservation measures. It is understood by all parties to this MOU that, because the I-70 Mountain Corridor project is anticipated to span many years, the descriptions of the LIZs, species affected, and recommended mitigation strategies in Table 1 are subject to change through time. All parties to this MOU agree to coordinate to update this Table, if necessary, during each applicable Tier II process and in those respective NEPA documents.

I. Purpose and Intent of the MOU

With this MOU, the Parties identify their interdependence in identifying, designing, and managing landscape elements to ensure effective populations of species identified by the ALIVE Committee. The Parties herewith establish a program of cooperation for the purpose of early and full implementation of corrective actions to solve

permeability problems in identified LIZs, and to streamline the section 7 consultation process under the Endangered Species Act for the I-70 Corridor Tier II projects. Time and resources will be better invested in proactive programs that involve a corridor-wide, coordinated program of species and habitat conservation and provide the maximum benefit to wildlife.

It is the intent of the Parties to increase the permeability of the I-70 Corridor to terrestrial and aquatic species, including but not limited to deer, elk, the boreal toad, fish (for example, greenback cutthroat trout), and forest carnivores (for example, Canada lynx). This includes development of management strategies that will result in the long-term protection and restoration of wildlife linkage areas that intersect the I-70 Corridor, improve habitat connectivity, and preserve essential ecosystem components.

The Parties recognize that:

1. This process goes beyond the ordinary regulatory or statutory requirements of its participants. While CDOT and FHWA have an obligation under the Endangered Species Act (ESA) section 7(a)(1) "to utilize their authorities in furtherance of the purposes of the Act by carrying out programs for the conservation of species listed pursuant to the Act," neither CDOT nor FHWA has a mission to sustain wildlife populations. They cooperate with and rely on resource and regulatory agencies to further the conservation of wildlife and the protection of endangered species.
2. Regulatory and resource agencies, and other stakeholders with an interest in wildlife habitat connectivity and conservation along the I-70 Corridor, have limited resources to address the barrier effects of the I-70 Corridor and to pursue key conservation objectives and principles for game animals and threatened, endangered, or otherwise sensitive aquatic and terrestrial species. By working together, these agencies can make the most effective and efficient use of limited resources.
3. Traditional project-by-project evaluation and treatment of regulatory requirements for, and mitigation of, impacts on wildlife have limited effectiveness in a corridor the extent of I-70.
4. Constructing wildlife passages at the earliest possible opportunity, particularly in locations where ordinary regulatory processes do not require mitigation or conservation measures for wildlife, would require the financial support of the Parties and other stakeholders, as well as an active pursuit of other elements essential to the function of wildlife passages. Financial support can include but is not limited to direct funding, in-kind contribution of labor or equipment, etc.
5. Resources otherwise devoted to the regulatory consultation and documentation process would be better spent by combining and streamlining the processes for multiple projects over an extended timeframe and the furtherance of a coordinated program to address habitat fragmentation and wildlife viability for the entire length of the Corridor, i.e., at the landscape, ecosystem level.
6. Existing planning and funding mechanisms for transportation projects can create limitations to the programmatic approaches envisioned by this MOU. Full implementation of a successful ALIVE outcome would require the participation by all Parties and other stakeholders in the commitment of resources beyond those meant for transportation mitigation.

With this MOU, the Parties propose to develop mechanisms that focus resources on results. The Parties will work together to identify programs or actions for implementing the MOU as opportunities, funding, or proposed transportation improvement projects warrant. The Parties seek to collaborate in identifying the means for funding and constructing wildlife passages as soon as possible, to use all available means to protect and maintain the viability of these passages as allowed by land management policy, and to identify regulatory review processes to accelerate project permitting.

Other stakeholders not party to this MOU also hold keys to full implementation of the ALIVE recommendations. Specifically, local governments, land managers, and private landowners with jurisdiction over or ownership of lands affected by the Corridor are instrumental in developing growth policies and defining conservation easements, land holdings, and other mechanisms which are needed to ensure the long-term viability of wildlife passages and other

best management practice (BMP) investments. In addition, financial participation by these other stakeholders, as well as other interested parties, would be necessary to fully implement the recommendations of ALIVE.

Construction of effective wildlife passages will require the cooperation of transportation, resource, and regulatory agencies and those other stakeholders with jurisdiction or ownership affected by the Corridor, whether or not they are Parties to this MOU. All Parties to this agreement understand that CDOT cannot commit public funding to construction of wildlife passages unless the Parties and other affected stakeholders with jurisdiction or ownership are in agreement to commit their respective resources, regulation, and management policies and practices to ensuring functional key wildlife passages in respective LIZs. Recognizing that, all Parties to this agreement commit to ensuring functional key wildlife passages and linkage areas along the length of the Corridor not only through full analysis of a reasonable range of alternatives in the PEIS and subsequent project-specific NEPA and their own respective management, regulation, design, construction, maintenance, and monitoring authorities, but also through collectively and actively seeking agreement and cooperation among those who are not Parties to this agreement but who have pertinent jurisdiction or ownership or are interested parties in the respective LIZs.

II. Cooperation

A. All Parties, within their statutory and regulatory authority, agree to work together toward the long-term protection and restoration of wildlife habitat or habitat linkages that intersect the I-70 Corridor. All Parties to this MOU understand that any action that would curtail or prohibit restoration of the functionality of a movement corridor identified by the ALIVE Committee could result in a reconsideration of the feasibility of an alternative or a wildlife passage associated with this Corridor. Based on this understanding, all Parties agree to reasonably cooperate in the implementation of this MOU. Such cooperation would include:

1. Supporting the concepts identified in this MOU and working to actively implement this MOU as authorized under applicable laws, regulations, and policies.

2. Providing transportation and wildlife expertise, data, and technical support to the ALIVE Committee for planning and project review that will mitigate impacts on, or provide betterments for, wildlife, and increase and improve wildlife habitat connectivity across the I-70 Corridor.

3. Considering the ALIVE Committee's recommendations when the opportunity to construct a specific wildlife passage arises; with the expectation that additional analyses are needed prior to any investment in wildlife passages or BMPs. Analysis will include evaluations of the effectiveness of previously-installed structures, including their location and design, as well as the compatibility of associated land use with the intended function of the structure.

4. Identifying programs or actions that could result in the long-term protection, restoration, or enhancement of wildlife habitat or habitat connectivity intersected by the I-70 Corridor. Implementation of ALIVE Committee recommendations would be subject to the respective Parties' planning, NEPA, and decision-making requirements. All Parties recognize the importance of management of enough land adjacent to each passage so that a reasonable person can conclude that the intended permeability function of each passage will be sustained as growth and other land uses inevitably occur.

5. Establishing more efficient processes of regulatory review and permitting, thereby helping to reduce the cost and delay of subsequent individual Tier II construction projects in the I-70 Corridor.

6. Working with the ALIVE Committee, local governments, and other stakeholders as appropriate to:

    a. pursue potential partnerships and funding mechanisms;

    b. identify and promote opportunities and resources to construct wildlife passages in the most effective locations based on the best available information on wildlife use of passages over or under highways and determined by supporting land use, and

c. sustain partnerships for the long-term protection and restoration of habitat in important habitat conservation and linkage areas.

7. All Parties to this MOU agree:

a. that passages in LIZs (see map, Figure 1) where construction of I-70 occurs as a result of the PEIS Decision and subsequent Tier II decisions will be built before or during such construction, providing all Parties and other stakeholders with jurisdiction or ownership in those respective LIZs are cooperatively committed to and are coordinating to ensure functional LIZs and passages. In coordination with the ALIVE Committee, Tier II NEPA and ESA section 7 analyses will identify the specific location and appropriate structure(s) for passages within each LIZ, based on best available information on wildlife species of concern, habitat connectivity, effectiveness of wildlife passages, and type and adjacent land use plans. Included in this effort are the development of other BMPs such as a fencing plan intended to direct or inhibit wildlife movement, as required, and an identification of the necessary funding to build and maintain the BMPs including wildlife passages and the corridor easements;

b. that, when funding options are identified through successful efforts of one or more of the Parties or stakeholders, or other independent initiatives, wildlife passages in identified LIZs that will not undergo construction as a result of the PEIS and subsequent Tier II decisions will be constructed with consideration of priorities developed by the ALIVE Committee;

c. All Parties to this MOU agree to partner as authorized in an effort to understand and satisfy the wildlife and habitat needs associated with each passage within the context of a Corridor-long, landscape-level ecosystem approach to wildlife needs and conservation measures. The design and location of each passage within each of the LIZs is necessarily site-specific, but all Parties agree as authorized to locating, designing, constructing, and maintaining each passage within the Corridor-long context.

B. Such cooperation by FHWA and CDOT shall include:

1. Leading the primary effort to initiate the ALIVE program, thereby helping to achieve the environmental goals of the PEIS and subsequent Tier II decisions, which extend beyond the requirements of CDOT and FHWA.

2. The design criteria of all alternatives considered in full in the PEIS will not preclude incorporation and construction of viable wildlife passages for the species of concern in that LIZ, as identified by the ALIVE Committee.

3. Pursuing options for identifying, and if necessary funding, an administrative position for a maximum of two (2) years. The function of the administrator would be to explore, identify, and pursue funding sources and mechanisms to construct wildlife passages, especially for those passages to be pursued beyond CDOT's legal responsibility. In the best interest of the ALIVE program, determining the need for an administrative position will be revisited regularly by the Parties and funding sought to maintain the position as determined necessary by the Parties.

C. Such cooperation by the USFS and the BLM shall include:

1. Considering the recommendations of the ALIVE program in the review of Tier II NEPA documents, considering the granting of any land actions or other use permits germane to movement corridors, and reviewing for consideration of approval of biological reports and participating in section 7 consultation under the ESA so that transportation projects and associated conservation measures can proceed in a timely manner.

2. Encouraging the cooperation and support of land lease holders and other entities with legal interest on public lands to ensure the realization of the objectives of the MOU, which could include their active participation in achieving the goals of the ALIVE program.

3. Exercising their respective regulatory requirements and authorities to protect wildlife species and their habitat. Accordingly, the USFS and the BLM, by means of ordinary and established planning and subsequent NEPA processes, will consider lands in proximity to I-70 for their habitat and wildlife movement attributes, among other multiple use considerations. They will treat installed wildlife passages consistent with their intended purpose of connecting functional wildlife movement corridors, and strive to maintain associated wildlife movement corridors.

4. Informing the CDOT Environmental Programs Branch, Transportation Regions 1 and 3 by letter of all requested land actions, special use permits, USFS and BLM plan amendments, or other pertinent actions, that could affect an identified habitat linkage and conflict with a planned wildlife passage area.

5. As opportunities arise, and in compliance with the Forest Service land adjustment policy, seeking to consolidate lands along the Corridor to maintain or improve habitat connectivity adjacent to the I-70 Corridor.

D. Such cooperation by the USFWS shall include:

Participating in and facilitating the development of regulatory streamlining instruments that accelerate the section 7(a)(2) consultation process under the Endangered Species Act as it may apply to transportation projects and their associated conservation measures, and any related right-of-way actions from the USFS or the BLM to FHWA and CDOT. A separate Programmatic Agreement will be pursued among FHWA, CDOT, and USFWS for this purpose.

E. Such cooperation by CDOW shall include:

Providing in-kind support through cooperation and consultation with other Parties, jurisdictions, and landowners to facilitate a Corridor-long perspective and understanding of wildlife needs and conservation measures; providing wildlife data and management expertise; and assist with monitoring the effectiveness of wildlife passages and LIZ management.

III. Principal Contacts

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Planning and Environmental Manager
Region 1, Colorado Department of Transportation
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Aurora, CO 80011
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michelle.li@dot.state.co.us

Other Parties' principle contacts are their ALIVE Committee members, i.e., each Party's respective affected Regional, Field Office, or Forest biologist.

IV. Non-Fund Obligating Document

Nothing in this MOU shall obligate either the Forest Service or any other Parties to obligate or transfer any funds. Specific work projects or activities that involve the transfer of funds, services, or property among the various agencies and offices of the Forest Service and any other Parties will require execution of separate agreements and be contingent upon the availability of appropriated funds. Such activities must be independently authorized by appropriate statutory authority. This MOU does not provide such authority. Negotiation, execution, and administration of each such agreement must comply with all applicable statutes and regulations.

V. Freedom Of Information Act (FOIA)

Any information furnished to the Forest Service under this instrument is subject to the Freedom of Information Act (5 U.S.C. 552).

VI. Participation in Similar Activities

This instrument in no way restricts the Forest Service or the Parties from participating in similar activities with other public or private agencies, organizations, and individuals.

VII. Responsibilities of Parties

The Forest Service and other Parties and their respective agencies and office will handle their own activities and utilize their own resources, including the expenditure of their own funds, in pursuing these objectives. Each Party will carry out its separate activities in a coordinated and mutually beneficial manner. Nothing in this MOU precludes the Parties from using outside grants or other funding sources to fulfill their responsibilities.

VIII. Effective Date

This MOU is effective as of the date of the signatures shown below and will expire upon the full implementation of the Selected Alternative in the Record of Decision for the I-70 Mountain Corridor PEIS.

Full implementation of this MOU may take place over a long time span. To deal with changing conditions, the Parties will meet within 60 days after the MOU is signed and annually thereafter, unless all Parties agree to another schedule, to review changes, consider unforeseen developments, and make decisions regarding the priorities, placement, and design of wildlife passages considered in this MOU.

IX. Modification

To be effective, all Parties must agree in writing to any modifications to this MOU.

X. Termination

Parties may terminate their participation in this MOU with a 30-day notice to the other Parties. Termination by any one Party will terminate the entire MOU and eliminate any remaining requirements for any of the Parties. Termination of this MOU does not relieve CDOT and FHWA of obligations identified in the PEIS/ROD, section 7 consultation, or other permit requirements.

XI. Availability of Funds

Implementation of this MOU by the federal agencies is subject to the requirements of the Anti-Deficiency Act (31 USC 1341) and the availability of appropriate funds. Nothing in this MOU will be construed by the Parties to require the obligation, appropriation, or expenditure of any money from the US Treasury.

XII. Dispute Resolution

All Parties agree to work cooperatively to avoid and resolve conflicts. The Parties agree to explore issues thoroughly before escalating disputes. Resolution mechanisms to ensure that adequate communication has occurred, such as mediation and facilitation, may be used at any level to help expedite resolution. If disagreements emerge which cannot be resolved at any level, the dispute will be escalated through management as appropriate.

XIII. Retention of All Authorities

Nothing in this MOU is intended to limit or diminish the legal obligations, responsibilities, and management authority of the Parties.

XIV. Establishment of Responsibility

This MOU is not intended to, and does not create, any right, benefit, or trust responsibility, substantive or procedural, enforceable at law or equity, by a party against the United States, its agencies, its officers, or any person.

XV. Authorized Representatives

By signature below, the Parties certify that the individuals listed in this document as representatives of the Parties are authorized to act in their respective areas for matters related to this agreement.

COLORADO DEPARTMENT OF TRANSPORTATION

By: Margaret A. Cook
For Russell George, Executive Director

COLORADO DIVISION, FEDERAL HIGHWAY ADMINISTRATION

By: Karla S. Petty
Karla S. Petty, P.E., Division Administrator

US FISH AND WILDLIFE SERVICE, ECOLOGICAL SERVICES

By: Susan C. Linner
Susan Linner, Colorado Field Supervisor

USDA FOREST SERVICE

By: Glenn P. Casamassa
Glenn P. Casamassa, Forest Supervisor, Arapaho & Roosevelt National Forests and Pawnee National Grassland
AND FOR
White River National Forest

US BUREAU OF LAND MANAGEMENT

By: Kent R. Murdock
for Jamie Connell, Field Manager, Glenwood Springs Resource Area

COLORADO DEPARTMENT OF NATURAL RESOURCES, COLORADO DIVISION OF WILDLIFE

By: Thomas E. Remington Jr.
Thomas E. Remington, Director, Colorado Division of Wildlife

The authority and format of this instrument has been reviewed and approved for FS signature.

LuAnn Waida 4/11/08
LUANN WAIDA Date
FS Agreements Coordinator

Attachments to ALIVE MOU

Table 1. Linkage Interference Zones and Recommended Mitigation

Life Zones	Linkage Interference Zones	Animal-Vehicle Collisions	Proposed Mitigation
Western Slope Foothills Glenwood Springs to Avon (mp 116 to mp 170)	**Zone 1: Dotsero (mp 131.4 to mp 134.5)** Setting: • Predominantly sagebrush with little tree cover. • The Nature Conservancy (TNC) recently purchased a conservation easement on the Bair Ranch property near this zone, which will enhance and preserve wildlife movement opportunities in this area. Wildlife Movement: • Known movement corridor for deer and elk. • Area fairly heavily used for crossing. • Most deer and elk in this zone cross from mp 133 west to the mouth of the Glenwood Canyon, avoiding the nearby lakes south of I-70 where several developments are under construction. • Mule deer severe winter range and winter concentration areas on both sides of I-70. • Elk winter range north of I-70. • Located adjacent to the BLM Glenwood Canyon lynx linkage that provides movement between Flattops Wilderness and Red Tables in WRNF. • CDOW indicates that as few as 30 percent of the roadkills in this area are ever reported. Existing Structures and Fencing: The existing transportation underpasses in this area are not being used as wildlife crossings and are not suitable for wildlife.	1.4 per mile per year	• mp 132.5 to mp 132.8: Repair/replace wildlife fencing, as appropriate. • mp 132.5 to mp 132.8: Redesign fence in areas prone to rockfall (approximately 100 feet); use concrete barrier/fence combination.
	Zone 2: Eagle County Airport to Town of Eagle (mp 142.0 to mp 145.3) Setting: • Open piñon-juniper woodland near I-70. • Riparian forest and shrub habitats. • Adjacent to the Eagle River. • Rapid development through the 1990s occurred in this area around Eagle County Airport. Planned developments in this area include, Frost Creek, and Diamond S Ranch developments south of I-70. Wildlife Movement: • CDOW describes this section of I-70 as a highway crossing area for big game. • Provides for movement to and from deer and elk severe winter range, winter concentration areas, and fawning/calving habitat to the north and south of I-70. • Mule deer severe winter range areas on north and south of I-70. • Elk severe winter range on north of I-70 on BLM lands. • Lands managed by the WRNF as elk habitat are located to the south of the zone. Existing Structures and Fencing: Game fencing exists through the entire length of zone on both sides of I-70, for approximately 35,850 total linear feet.	0.39 per mile per year	• mp 143.1: Remove fill at bridge west of Cottonwood Creek to increase height, making it more suitable for an elk crossing. • mp 142.0 to mp 142.3: Realign wildlife fencing in steep areas north of I-70 where rockfall damage occurs, and repair damaged fencing as necessary. • mp 145.5: Remove berm from south entrance of passage. • mp 143.8: Investigate potential costs for conservation easement on private land surrounding the Eagle River.
	Zone 3: Eagle to Wolcott (mp 147.3 to mp 153.4) Setting: • The eastern portion of the zone is moderately forested, while the western portion closer to the town of Eagle is sparsely forested. • Zone extends through Red Canyon. • Steep slopes on both sides of highway for most of its length. • Large areas of BLM lands are located to the north and south with mixed private lands in between. • Recreation uses near the zone include numerous BLM trails. Wildlife Movement: • Elk severe winter range southwest of I-70. • Mule deer severe winter range, winter concentration to the south of I-70. • Forest carnivores including bear and mountain lion frequent the area. • Providing for lynx movement across shrub-steppe habitats from Flattops Wilderness in the east to Castle Peak in the west, the BLM has designated this zone as a lynx linkage area. Existing Structures and Fencing: Solid 8-foot fencing exists on both sides of I-70 through the entire zone. No suitable wildlife crossing structures are currently located through this area.	0.39 per mile per year	• mp 153.8: Extend existing fencing to I-70 bridge across Eagle River. • mp 151.8: Recommend new wildlife crossing structures to be as large as possible depending on engineering design requirements and topographic limitations of the area. • Investigate median barriers with gaps large enough to accommodate small mammals (for example, raccoons and skunks). Place barriers every 0.25 mile. • Investigate costs of conservation easement around mp 151.8.

Table 1. Linkage Interference Zones and Recommended Mitigation (Continued)

Life Zones	Linkage Interference Zones	Animal-Vehicle Collisions	Proposed Mitigation
Western Slope Foothills – Continued Glenwood Springs to Avon (mp 116 to mp 170)	**Zone 4: Wolcott to Avon (mp 154.5 to mp 166.5)** Setting: • Sparsely forested. • Rapid development around Avon and Edwards occurred through the 1990s. • Significant development is still occurring through the eastern half of the zone, including 250 housing units, soccer fields, a school, and a church south of mp 163. • Red Sky Ranch, a large development of 35-acre lots southwest of the zone, is being subdivided into 15-acre lots. • The BLM recently completed a 1,400-acre land swap to private interests near the zone in exchange for lands outside Grand Junction. Wildlife Movement: • Heavily traveled by carnivores, including black bear and mountain lion (Bellyache Ridge); designated by CDOW as a human conflict area for both species. • CDOW considers most of the area a highway conflict zone for deer and elk. • Elk and mule deer severe winter range and winter concentration both sides of I-70. The area south of I-70 through the eastern portion of this zone contains elk severe winter range and calving areas. • Federal lands to the north are managed by the WRNF for deer and elk winter range, while the Holy Cross Wilderness is located to the south. • Rapid development, combined with habitats historically occupied by deer, elk, and forest carnivores has resulted in wildlife conflicts in this zone. • The zone is located at the western edge of the Castle Peak BLM lynx linkage. BLM has designated the area between mp 154.0 and 160.0 as lynx habitat linkage. Existing Structures and Fencing: This linkage interference zone currently has no CDOT wildlife fencing.	1.2 per mile per year	• mp 153.9 to mp 159.0: Add wildlife fencing on south side of I-70 between Wolcott interchange and where I-70 crosses the Eagle River. Create gaps with berms or one-way gates to enable wildlife to escape from highway side. • Recommend new wildlife crossing structures to be as large as possible depending on engineering design requirements and topographic limitations of the area. • mp 155.3 or mp 155.6: Add crossing structure across I-70 and US 6 north and west of Bellyache Ridge, just south of Alkali Creek. • mp 159.7: Add crossing structure south of Red Canyon Creek and Bear Gulch, south and east of existing motorized underpass. • mp 163 to mp 166.5: Add wildlife fencing on both sides of I-70. • Investigate conservation easements for each proposed crossing.
Western Slope Montane Avon to East Vail (mp 170 to mp 182)	**Zone 5: Dowd Canyon (mp 169.5 to mp 172.3)** Setting: • The area has little forest cover adjacent to I-70. • Steep slopes on the north side are a significant rockfall hazard. • The WRNF surrounds the zone to the north and south, while pockets of residential development are located to the east and west. • Federal lands and good habitat are located north and south. • Wildlife fencing has been damaged. Wildlife Movement: • This is a western Vail north–south connection for wildlife movement. • Elk winter range/severe winter range is located south of the zone. • Important elk and mule deer migration corridor. • Camera studies performed by CDOW have shown the area to be used by elk, deer, and mountain lion. • Bear and lion conflict areas. • Designated as a lynx linkage area by USFS. Existing Structures and Fencing: This linkage interference zone has median and guardrail barriers along most of I-70. A concrete box culvert and several land leases by CDOW are located in this zone for wildlife movement. The existing crossing structure is long and only 10 feet in height, inhibiting the movement of large elk. Most of I-70 in this zone includes CDOT wildlife fencing on both sides, which is often damaged by rockfall on the north and winter snowplowing activities from residences to the south. A paved bike path with restricted winter usage is located near the existing crossing structure in addition to several trails and a river rafting “put in” location. Eagle County plans to expand the paved bike path to the west.	0.59 per mile per year	• Recommend new wildlife crossing structures to be as large as possible depending on engineering design requirements and topographic limitations of the area. • mp 170.2 to mp 172.5: Replace existing wildlife fencing with reinforced fence through rockfall area north of I-70, where current fencing has numerous holes. • CDOT should coordinate with community at West Vail to avoid damage caused by plowing snow against fences.

Table 1. Linkage Interference Zones and Recommended Mitigation (Continued)

Life Zones	Linkage Interference Zones	Animal-Vehicle Collisions	Proposed Mitigation
Subalpine East Vail to US 40 (mp 182 to mp 233)	**Zone 6a and 6b: Upper and Lower West Vail Pass (mp 181.7–188.5)** Setting: • Coniferous forest grows to the edge of both sides of the highway through most of the zone. • Bridges are highly effective as wildlife crossings to connect forest lands from mp 182.5–185.3. • Eagles Nest Wilderness Area is located directly north of I-70 through most of the zone. • The land on the southwest side of lower west Vail Pass is forest property managed as forested landscape linkage, intended to be maintained for a connection between Eagles Nest Wilderness Area to the east and the Holy Cross Wilderness Area to the southwest. • The forest lands at the top of upper west Vail Pass are managed for year-round motorized backcountry recreation to the west and for nonmotorized backcountry recreation to the east. Wildlife Movement: • Surrounded by the WRNF, this zone is used heavily by wildlife and has a low amount of roadkill. • Designated as a lynx linkage area by the USFS; based on habitat of the area, lynx usage is highly probable. (Note: Two lynx were killed within a short distance of each other in vehicle collisions on upper west Vail Pass, one in 1999 and one in 2004, both near mile marker 187.) • Bighorn sheep range north. • Bear and lion conflict area. Existing Structures and Fencing: Six open-span bridges are located contiguously in the eastbound and westbound direction of I-70 through lower west Vail Pass, although there are no existing crossing structures through upper west Vail Pass. Animals in the area are found to readily jump over median barriers but showed reluctance to cross in areas with guardrail structures (Barnum 2002). The offset lanes of the interstate and associated jersey barriers are significant movement barriers to wildlife in portions of this LIZ.	0.03 per mile per year	• mp 188.0 and mp 186.3: Recommend new wildlife crossing structures to be as large as possible depending on engineering design requirements and topographic limitations of the area. • mp 188.0 to mp 186.3: Add CDOT wildlife fencing between proposed structures on both sides of I-70.
	Zone 7: East Vail Pass to Copper Mountain (mp 190.4 to mp 194.0) Setting: • Most of zone is forested, although not as densely as west Vail Pass. • Significant open areas exist. • The eastbound and westbound lanes of I-70 are separated through this section with an open wetland area containing West Tenmile Creek. • The zone is surrounded by ski areas, forest property managed as forested landscape linkage, nonmotorized backcountry recreation, and primitive wilderness. • Several parcels of private land are located within the east end of the zone, just west of Copper Mountain near the Guller Creek and West Tenmile Creek bridges. • In addition to the Tenmile-Vail Pass National Recreation Trail that runs the length of the zone, USFS trails are located through Stafford Gulch, Wilder Gulch, Corral Creek, and Guller Creek. Wildlife Movement: • This zone is located within the USFS Vail Pass lynx linkage zone. • CDOW indicates that wildlife cross through drainages predominantly at Smith Gulch and Guller, Stafford, Wilder, and Corral creeks. • CDOW also noted that forest carnivores are frequently seen crossing at Stafford Creek. The forest cover is less dense in this area than that seen on west Vail Pass. Existing Structures and Fencing: Five existing open-span bridge structures occur in the eastbound direction through this zone. Only one structure exists in the westbound direction, and it is not directly adjacent to a corresponding structure in the eastbound direction.	0.68 per mile per year	• Recommend new wildlife crossing structures to be as large as possible depending on engineering design requirements and topographic limitations of the area. • mp 192.5: Add crossing structure to westbound side of I-70 north of Stafford Creek. • mp 193.4: Add crossing structure to westbound side of I-70 north of Guller Creek. • Add berms and screening vegetation to guide wildlife between existing Wilder Gulch (eastbound) and Corral Creek (westbound) crossings. • Add berms and screening vegetation to guide wildlife between existing Smith Gulch (eastbound) and Corral Creek (westbound) crossings. • Provide space between guardrail structures and the road to allow wildlife jumping over barriers to avoid jumping directly into traffic.
	Zone 8: Officers Gulch/Owl Canyon (mp 195.5 to mp 200.5) Setting: • Area dominated by extreme slopes on all sides; canyon opens up to Wheeler Flats area near Copper Mountain (south) and Frisco (north). • Borders Eagles Nest Wilderness Area (west) and WRNF lands managed for nonmotorized backcountry recreation and scenic byways, which is conducive to wildlife habitat. • This steep canyon area has several water bodies, including Uneva Lake, Officers Gulch Pond, and Wheeler Flats Ponds. • The area is heavily forested with tree cover for wildlife use close to I-70. • While the area is encompassed by the WRNF, the land surrounding Uneva Lake to the east of I-70 is a forest inholding, although the owners have indicated to the USFS that they do not plan to develop the land. Several other private mine inholdings are located to the east of I-70 in this area, although they are located on very steep slopes. • The lands are managed by the WRNF as pristine wilderness, nonmotorized backcountry recreation, and scenic byways or travel corridors. The Tenmile-Vail Pass National Recreation Trail runs through the length of this linkage interference zone. Wildlife Movement: • Connection between habitats in the Gore Mountain Range and Tenmile Mountain Range, especially for carnivores. • CDOW considers mp 200.8 a black bear movement corridor. • Mule deer migration corridor runs parallel. • Located within the USFS Officers Gulch lynx linkage area, providing movement between Eagles Nest Wilderness Area and the Tenmile Mountain Range. • USFS biologists have indicated that most of the ungulate movement in the area is lateral with the highway. Existing Structures and Fencing: A single box culvert is located at mp 199.6. Box culverts are viewed as acceptable structures for the area by USFS and CDOW for most carnivore highway crossing activity in the area. An interchange at Officers Gulch is used as an informal overnight truck pullover. WRNF manages an area adjacent to Officers Gulch Pond that is proposed as an overnight camping area, although the area is currently not for overnight use and USFS indicated overnight use would potentially inhibit carnivore movement.	0.24 per mile per year	• mp 198.0, mp 199.2, and mp 200.8: Recommend new wildlife crossing structures to be as large as possible depending on engineering design requirements and topographic limitations of the area. • Investigate amending WRNF plan to exclude overnight use of area surrounding Officers Gulch Pond, planned and secondarily managed as a campground site.

Table 1. Linkage Interference Zones and Recommended Mitigation (Continued)

Life Zones	Linkage Interference Zones	Animal-Vehicle Collisions	Proposed Mitigation
Subalpine – Continued East Vail to US 40 (mp 182 to mp 233)	**Zone 9a: Laskey Gulch (mp 207.0 to mp 209.7)** Setting: • The area is moderately forested, transitioning to sagebrush closer to the town of Dillon. • Located between Dillon and a steep pass leading to the EJMT and constructed on steep cut-and-fill slopes of I-70. • In Dillon, condominiums have been built along the western edge of the linkage interference zone on the south side of I-70 within 0.5 miles of Laskey Gulch. Sound walls are currently being constructed adjacent to the condominiums. Due to the vertical height of these walls, they would be considered a movement barrier to most species of terrestrial wildlife. • Solid median and guardrail barriers are located through the length of the linkage interference zone, and no crossing structures currently exist. • This zone is within the WRNF and is managed as forested landscape linkage. • Most private lands are developed in this area, although the Denver Water Board possesses several large undeveloped inholdings in the central portion of the zone. Wildlife Movement: • Laskey Gulch is an important connection for deer, elk, and bear. • Elk severe winter range habitat north and south of I-70. • Elk and mule deer highway conflict areas. • Mule deer and bear migration corridors. • Potential lynx crossing. Located within the USFS Loveland Pass lynx linkage area, this zone provides for north-south lynx movement from the Ptarmigan Peak Wilderness Area and Williams Fork River area to forest lands south of I-70. Existing Structures and Fencing: CDOW noted that resident populations of elk and deer in the area were not obstructed by the golf course south of I-70 and would benefit from a crossing structure at Laskey Gulch to reconnect lands managed by the WRNF as deer and elk winter range north and south of I-70.	0.50 per mile per year (total zone 9)	• mp 208.3: Recommend new wildlife crossing structures to be as large as possible depending on engineering design requirements and topographic limitations of the area. • Coordinate with local planners to ensure that area zoning accommodates a wildlife structure in this location. • Continue interagency efforts to ensure that future land planning and zoning efforts improve the viability of the wildlife corridor.
	Zone 9b: Hamilton Gulch/Dead Coon Gulch (mp 210.7 to mp 212.6) Setting: • With the exception of cut-and-fill slopes of I-70, this area is densely forested. • This zone includes 3- to 5-foot concrete center barrier structure throughout its length, and approximately 2,300 feet of guardrail. • Straight Creek follows the length of the zone along I-70. • Several large road cuts and a runaway truck ramp are located north of I-70 in this zone. • Straight Creek and wetland areas are located below I-70 through the zone to the south. Hamilton Gulch reaches I-70 at mp 211.5, while Dead Coon Gulch lays further to the east at mp 212.2. Members of the ALIVE committee from both the USFS and CDOW commented that they felt that Hamilton Gulch and Laskey Gulch were both important and that they should both be considered equally. Wildlife Movement: • High usage by deer and elk along Hamilton Gulch and near Dead Coon Gulch to the east. • Located within the USFS Loveland Pass lynx linkage area and managed as forested landscape linkage. • The USFS noted that numerous elk and deer tracks are seen through the area and the zone would connect areas north of I-70 managed as forested landscape linkage and pristine wilderness to lands managed for forested landscape linkages south of I-70. Existing Structures and Fencing: I-70 was constructed on large fill slopes through this zone and no crossing structures currently exist, although two 4-foot plastic pipes and one corrugated metal pipe are located in the zone. Solid median barriers and an offset height between eastbound and westbound directions of I-70 are located through the length of this zone.	As above	• mp 212.2: Recommend new wildlife crossing structures to be as large as possible depending on engineering design requirements and topographic limitations of the area.

Life Zones	Linkage Interference Zones	Animal-Vehicle Collisions	Proposed Mitigation
	Zone 10: Herman Gulch/Bakerville (mp 216.7 to mp 220.8) Setting: • Herman Gulch is located 3 miles east of EJMT, surrounded by the ARNF. • The forest lands are managed for scenery, ski-based areas (Loveland), and nonmotorized backcountry recreation. • Six residential structures are located near I-70 north of the underpass at Herman Gulch. • The Continental Divide National Scenic Trail traverses through this area along the Herman Gulch trail to the north of I-70 and along the Loveland to Bakerville trail to the south of I-70. Wildlife Movement: • Considered important lynx habitat. Herman Gulch lynx linkage area is located within this zone, designated as a connection between suitable lynx habitats to the north and south of I-70. If quality habitat north of I-70 were combined with that south of the highway, a more viable lynx range would be possible, especially if connectivity across the Corridor improved. • ARNF has designated the area a lynx linkage zone. • Boreal toad breeding area. • Snowshoe hare inhabit the Mount Bethel Avalanche Path east of Herman Gulch and other avalanche paths in the area, providing forage for lynx and other forest carnivores. • USFS and CDOW indicated that evidence existed that two female lynx were using the area as home range. A lynx was killed on I-70 by a vehicle in the area of Herman Gulch in 2000. Another female (pregnant with 2 fetuses) was killed near eastbound mp 217 on 5/19/2005. Existing Structures and Fencing: Motorists use the shoulder of I-70 as informal parking on the south side of I-70 near mp 219. Few median barriers are located through this zone, although guardrails are located through most of its length.	Data Unavailable	• mp 217.3: Design corridor to allow free movement of wildlife under I-70 within this zone. • Continue interagency efforts to ensure that future land planning and zoning efforts improve the viability of the wildlife corridor.

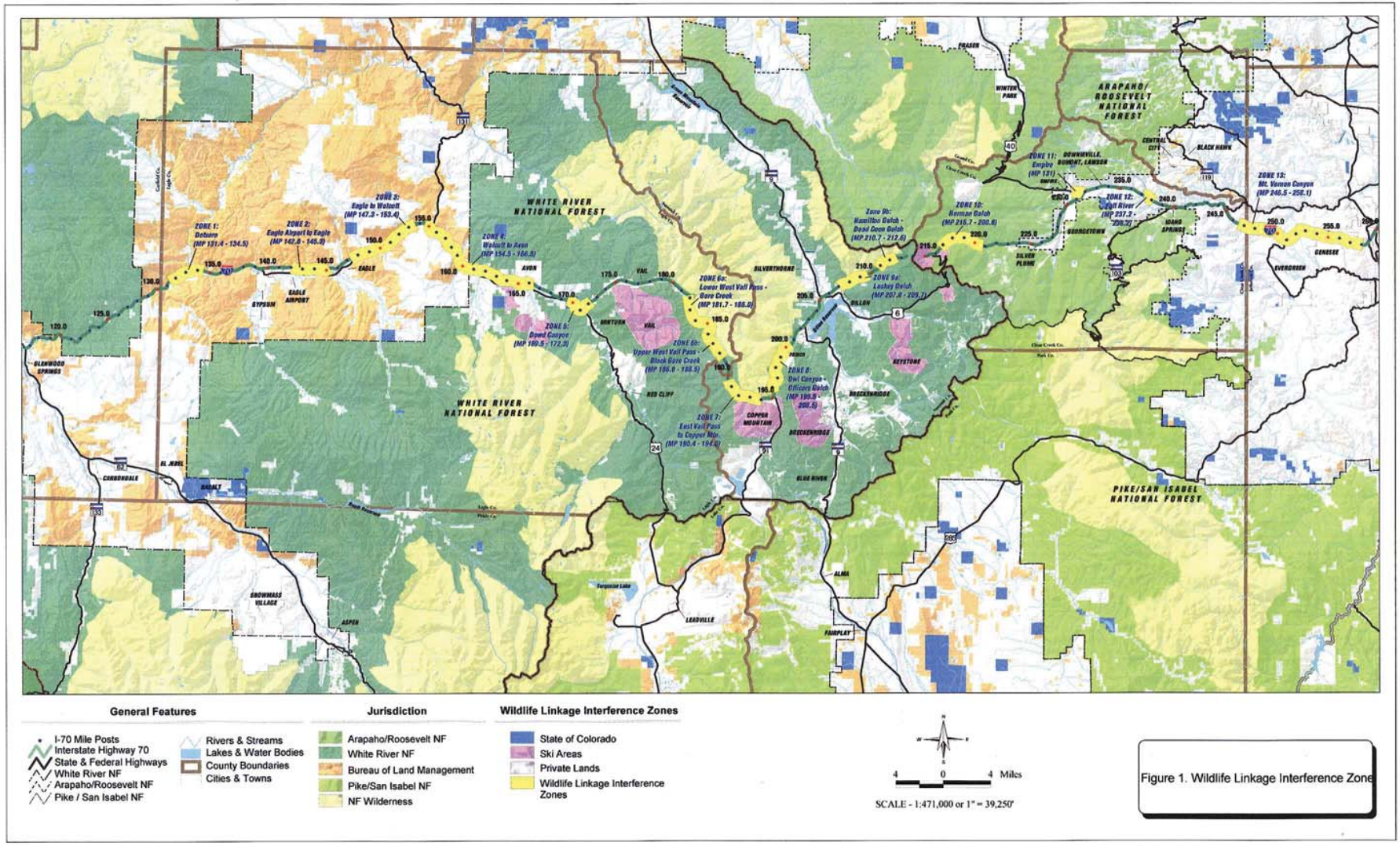
Table 1. Linkage Interference Zones and Recommended Mitigation (Continued)

Life Zones	Linkage Interference Zones	Animal-Vehicle Collisions	Proposed Mitigation
Eastern Slope Montane Silver Plume to Mount Vernon Canyon (mp 233 to mp 255)	**Zone 11: East of Empire on US 40 (off I-70 – approximately mp 232.0)** Setting: • North-facing slope heavily forested; south face primarily bare exposed rock cliffs. • ARNF is located just to the east of this zone. Wildlife Movement: • Steep slopes used by bighorn sheep on both sides of US 40. This zone was delineated specifically to address issues with bighorn sheep, which approach the edge of the highway to lick salt and are sometimes hit by vehicles at the edge of the I-70 and US 40 interchange. Bighorn sheep generally do not attempt to cross I-70 (except near the Henderson Mine west of this zone) but do cross US 40 and are frequently hit west of Empire. • Mule deer winter concentration north; mule deer highway conflict area. • Mountain lion conflict area. Existing Structures and Fencing: CDOW stated that bighorn sheep would not use an underpass or enclosed structure to cross a roadway.	0.42 per mile per year	• Good place for overpass structure 4.2 miles west of US 40/I-70 interchange, primarily for bighorn sheep crossing. • Investigate using jersey barriers or other barrier structures on both US 40 and I-70 to keep sheep away from road edge.
	Zone 12: Fall River (mp 237.2 to mp 238.2) Setting: • Primarily forested, though not densely. No wildlife fencing. Relatively gentle slopes throughout zone. • Located entirely on private land with the ARNF approximately 2 miles away to the north and south. • Numerous residences are located along Fall River Road and several along US 40. Wildlife Movement: • The Fall River area provides a significant break in the surrounding topography and functions as a movement corridor for mule deer, elk, bighorn sheep, mountain goat, black bear, and mountain lion. • CDOW noted that carnivores are frequently hit in this area, and there are concerns about elk populations becoming habituated and inhabiting the area year-round. • Bighorn sheep, elk, bear, and mountain lion frequent the area and are hit occasionally. • Resident elk living close to populated areas are a concern in this area. Elk calving 0.25 miles north. • Mule deer severe winter and winter concentration north. • The ALIVE Committee identified this zone , however, CDOW has concerns regarding the introduced mountain goats currently inhabiting the Mount Evans area south of I-70 having the ability to reach areas north of I-70 and compete with native bighorn sheep. Existing Structures and Fencing: Two concrete box culverts, one 4 feet in height at Georgia Gulch, the other 10 feet in height at Fall River, currently exist in this linkage interference zone. An underpass is located at the intersection of US 40 and I-70. Solid median barriers are located through the length of the linkage interference zone and a guardrail is located on the south side of I-70 through most of the zone.	Reported numbers too low for average	• Recommend new wildlife crossing structures to be as large as possible depending on engineering design requirements and topographic limitations of the area. • Factor improvements into bridge redesign (Fall River Road Interchange) such as a wider span and leaving adequate space along road and river for wildlife passage.

Life Zones	Linkage Interference Zones	Animal-Vehicle Collisions	Proposed Mitigation
	Zone 13: Mount Vernon Canyon (mp 246.5 to mp 258.1) Setting: • Several Denver Mountain Park and Jefferson County open space properties are situated in or adjacent to this zone. • Mountain subdivisions have been extensively built through this area. • The 2,340-acre Denver Mountain Park (Genesee) extends north and south of I-70 between mp 251 and 254 and approximately 20 percent is fenced for bison rangeland adjacent to I-70. The park includes open forests and grasslands. Wildlife Movement: • Overall, this zone sees more reported roadkill than any other zone through the Corridor. • Several deer and elk highway conflict areas mapped by CDOW. • Bear summer and human conflict areas south of I-70. • Due to extensive subdivisions, elk in zone have habituated to human presence. • Resident elk are frequently hit by vehicles; groups of five or more elk have been killed in individual accidents in this linkage interference zone. Existing Structures and Fencing: CDOW indicated that fencing in this area would be detrimental and could trap wildlife in the roadway. CDOW also indicated that it would be difficult to direct wildlife to crossing structures in this zone. No wildlife fencing and very little guardrail and median barriers exist in this zone. No suitable wildlife crossing structures currently exist for larger mammals, except for a transportation dirt road underpass at Soda Creek near mp 249.	2.37 per mile per year	• Recognized as a problem area; mitigation measures currently being evaluated. • Fencing throughout the length of the zone may be the only solution. However, CDOW has stated that fencing could be detrimental to the wildlife in the area and has suggested that wildlife fencing through the zone not be considered as a mitigation measure for the area. • Investigate costs of adding intelligent signs to warn motorists about wildlife movement.

FS Agreement No. 08-MU-11021000-013
Cooperator Tax ID No. _____
Cooperator Agreement No. _____

Figure 1. Wildlife Linkage Interference Zones



Guidelines for Improving Connectivity for Terrestrial and Aquatic Wildlife on the I-70 Mountain Corridor

I. CONSIDERATIONS FOR TERRESTRIAL PERMEABILITY

Medium and Large-Sized Box or Arch Culverts and Bridges

A) CREATE OR MAINTAIN FUNCTIONAL WILDLIFE CROSSINGS FOR MEDIUM-SIZED AND LARGE ANIMALS AT AN AVERAGE INTERVAL OF 1 MILE OR LESS ALONG THE I-70 MOUNTAIN CORRIDOR, DEPENDING ON ANIMAL MOVEMENT PATTERNS, TOPOGRAPHY AND HABITAT FEATURES TO PROVIDE PASSAGES FOR MEDIUM AND LARGE-SIZED ANIMALS. TO ACCOMPLISH THIS**:**

1. Where a drainage structure (culvert, concrete box culverts (CBC) or bridge) is needed as part of the highway system, install, modify or maintain existing drainage structures to accommodate wildlife movement

Where terrain permits and where it is practical:

a) Install the largest bridge (preferably) or culvert practicable for any given location or terrain.
b) Replace a bridge with a bridge of equal size or larger. Replace a culvert with a bridge, arch culvert, box culvert, or buried-bottom pipe of equal size or larger.[1]
c) Install the shortest structure practicable for a given roadway width, while maximizing structure width (span) to maximize openness and avoid a 'tunnel effect'. Make structures wider rather than taller. Wide underpasses allow animals to have a broad viewing area, which makes them feel less vulnerable.
d) Consider two shorter underpasses with a median or 'atrium' instead of one long structure under four or more traffic lanes.
e) Ensure visibility from one end of a structure to the other.

[1] For species-specific design and dimensional specifications, use the following references:
Clevenger, A. P. and M. P. Huijser. 2011. Wildlife crossing structures handbook: design and evaluation in North America. Federal Highway Administration Report No. FHWA-CFL/TD-11-003. Lakewood, CO. [see Chapter 4]
Kintsch, J. and P. Cramer. 2011. Permeability of existing structures for wildlife: developing a passage assessment system. Washington Department of Transportation Report No. WA-RD 756.1. Olympia, WA. [see Tables 1 & 2]

f) Maintain a natural substrate underneath the bridge. If concrete is necessary to prevent scour, then it is recommended to cover the concrete with a natural substrate. Install baffles to retain sediment and prevent scour.
g) Use flooring of native material. For passages with perennial or ephemeral water flow, design structures to be wide enough to provide a dry pathway at least 3' wide for animals to use on one or both sides of the waterway.
h) Engineer structures to minimize traffic noises for animals inside of or at the entrance to a structure (e.g., use noise-absorbing surfaces inside underpasses to reduce resonating noise, and/or use quiet pavement to reduce the extent of a road's noise disturbance zone).
i) Limit roadway lighting where crossing structures are located.
j) Use vegetated 'green screens' or other mechanisms along the sides of over-crossings to reduce highway noise and lights from animals on the structure.
k) Solid bridge railings should be installed immediately above under crossings to reduce highway noise and lights for animals crossing below.
l) Remove barriers at structure entrances that could prevent wildlife passage including, fencing or gates, boulders, rip-rap, or provide a pathway for wildlife through the obstruction.
m) Maintain or restore native vegetation immediately adjacent to the structure at each entrance to encourage wildlife activity, provide natural cover and filter traffic light and noise. Use native vegetation seed to encourage wildlife use, promote establishment and suppress weedy species.
n) Avoid using rip-rap or boulders to maintain aprons at the culvert entrances as these may be difficult for hooved animals to negotiate. If a rip-rap apron must be used, consider placing topsoil over the rip-rap along the edges so as to create a natural path or game trail.
o) Design passage characteristics for both mobile species as well as limited-mobility species (e.g., pile up stumps or boulders along the inside wall of a large underpass to provide small mammal cover).

2. Locate additional structures at points where "Linear Wildlife Guideways" intersect I-70, where wildlife prefer to cross

Linear Wildlife Guideways are natural travelways defined as topographical ridges or drainages, sharply delineated changes in vegetation, or vegetation forming a peninsula. The intersection of a linear guideway with a roadway often creates a well-defined, intensely used crossing zone.

a) Maintain vegetated ridges and drainages or other sharply defined changes in vegetation inside, and if possible outside the Right of Way.
b) Use fencing to direct animals toward underpass crossings and away from road approaches.
c) Reduce distance to cover by maintaining natural vegetation around the inflow and outflow of drainage structures, preferably in the form of vegetated peninsulas.
d) Secure lands adjacent to crossing structures for long-term habitat protection.

3. Construct CBCs and bridges using natural colors and textures

a) Construct sloped side supports instead of vertical walls. Use the lowest angle possible and natural substrate for abutment slopes.
b) If support slopes are steep and/or rip-rap must be used for abutment slopes, construct a flat, dry pathway at least 5' wide cut into each slope.
c) Use open support pillars instead of walls for structures with a long span.
d) Avoid the use of mesh erosion control netting, which may ensnare snakes.

4. Design and maintain fencing to prevent wildlife from crossing at high-risk areas and to lead them to Wildlife Road Crossings

a) Fencing for large mammals should be at least 8' high, with a mesh size less than 10cm x 15cm, without gaps between the fence and the ground and, where required to prevent animals from digging underneath, seated at least 15cm into the ground. [2]
b) Avoid constructing fencing for > 1 mile without providing suitable safe crossing opportunities.
c) Fencing should be placed the entire length between structures and in medians between culvert/bridge openings to prevent animals from entering the roadway from the median.
d) Ensure that fencing is fully connected to structures without gaps.
e) Minimize "natural ladders" adjacent to the fence which could facilitate an animal climbing over the fence (e.g. trees, large bushes, etc.).
f) Construct and/or reposition wildlife fencing such that all culvert outlets (large and small culverts) are located outside of the ROW.
g) Construct escape ramps at regular intervals to provide escape routes for animals trapped inside of the ROW.
h) Use control mechanisms such as double cattle guards and electric mats to prevent animals from entering the ROW through gaps in the fencing (e.g., at interchanges).
i) Curve fence ends back into the landscape away from the ROW and/or use boulder piles at fence ends to discourage wildlife from crossing the roadway at fence ends.
j) Provide human access through fencing in areas where access is important to prevent people from damaging the fencing (e.g., ladders over the fencing, small angular passageways through the fence where a human could walk through but an animal could not, or, for private land access only, gates).

[2] For fencing specification, refer to:
California Department of Transportation Wildlife Crossing Guidance Manual (p. 61):
http://dap3.dot.ca.gov/hq/env/bio/wildlife_crossings/
Arizona Department of Transportation Wildlife Funnel Fencing Summary:
http://www.azdot.gov/highways/EPG/EPG_Common/PDF/Technical/Wildlife_Connectivity/Wildlife_Funnel_Fencing/Wildlife_Funnel_Fencing_Summary.pdf

5. Where guard rails, regaining walls or jersey barriers or steep road cuts are required, keep in mind that barrier ends tend to funnel animals onto the roadway

a) Locate the ends of barriers where there is a good line of sight to give motorists adequate time to avoid animals that enter the roadway at these locations.
b) Consider locating wildlife crossings at the end of barriers where appropriate, based on wildlife movement patterns, topography and habitat features.

6. Avoid offsetting culverts and bridges where multiple structures are needed under a divided highway or where two roads run parallel to one another so that animals have a straight line of sight through all of the structures

7. Install features to minimize or prevent human use of wildlife crossing structures such as signs or barriers at potential access points

8. Install bird poles along wetlands or bridges to force birds to fly higher over the roadway

9. Add features to bridges to promote day and night roosting for bats, where appropriate

a) To function as day roosts, bridges should be greater than 10' above the ground, have vertical crevices 0.5 to 1.25" wide, have vertical crevices 12 inches or greater in depth, be sealed from rainwater and debris entering from above, have full sun exposure, and not be situated over a busy roadway passing underneath the structure.
b) To function as a night roost, bridges constructed from pre-stressed concrete girder spans, cast in place spans, or steel I-beams are best. Bats alo prefer vertical concrete surfaces located between beams that provide protection from wind and remain warm at night.

10. Develop wildlife-friendly maintenance practices, such as lead paint recovery and timing of operations

11. Conduct monitoring of wildlife use of new and retrofitted structures (e.g., remotely-triggered cameras, track beds) to assess effectiveness of mitigation measures for the purpose of making appropriate adjustments as needed and improving designs of future mitigation measures

Small Box or Pipe Culverts

A) CREATE OR MAINTAIN FUNCTIONAL WILDLIFE CROSSINGS AT AN AVERAGE INTERVAL OF 1/4 MILE OR LESS ALONG THE I-70 MOUNTAIN CORRIDOR TO PROVIDE PASSAGES FOR SMALL MAMMALS. TO ACCOMPLISH THIS:

1. Where a drainage structure (culvert, concrete box culverts (CBC) or bridge) is needed as part of the highway system, install, modify or maintain existing drainage structures to accommodate wildlife movement.

Where terrain permits and where it is practical:

a) Replace small drainage culverts with culverts of no less than 3' diameter for small-bodied animals or 4' for medium-bodied animals (e.g., coyotes and bobcats), unless terrain does not permit. When installing equalizer pipes between wetlands with small mammal ramps, pipes must be minimum 4' diameter.
b) Install concrete pipes rather than corrugated steel, as the concrete provides a better surface for wildlife movement and absorbs some moisture, which can facilitate movement for some species.
c) Consider installing a low-gradient dry culvert for wildlife passage adjacent to a steep gradient drainage culvert.
d) Culverts should be built or modified with dry ledges for use by water-shy organisms; these ledges should be constructed to be able to withstand flood events.
e) Routine maintenance of culverts is essential to maintain culvert functionality for wildlife movement to remove accumulated sediment or other obstructions inside the culvert or at the culvert entrances.
f) Maintain natural vegetation cover, including low-stature cover for amphibians.
g) Avoid using rip-rap or boulders to maintain aprons at the culvert entrances as these may be difficult for some small animals to negotiate. If a rip-rap apron must be used, consider placing topsoil over the rip-rap along the edges so as to create a natural path or game trail.
h) Integrate fencing and structures to guide animals to crossing structures. Fencing at small culverts used by medium-bodied animals (e.g., coyotes and bobcats) should be 3-6' high, while fencing for small-bodied animals should be at least 3' high with a small mesh size and entrenched into the ground several inches to prevent animals from digging under. For reptiles and amphibians, a fine mesh fence, concrete walls, or aluminum flashing may be used. Remove and maintain trees, brush, etc that could allow an animal to climb over the fence.
i) Construct and/or reposition wildlife fencing such that all culvert outlets are located outside of the ROW.

2. Enhance existing and new structures with the installation of small mammal ramps or rock walkways that extend the length of a culvert so that small mammals can cross even in wet conditions. Small mammal ramps in culverts are particularly recommended where the roadway bisects a wetland or riparian zone [3]

3. Where possible, use cable median and shoulder barriers instead of jersey-style walls. Where concrete median or shoulder barriers are required, install jersey barriers with 'scuppers' or small openings on the bottom, or barriers with intermittent gaps to allow small mammals to pass through (note: the effectiveness of such gaps has not yet been proven or disproven).

[3] For small mammal ramp guidelines, refer to:
Montana Department of Transportation Small Mammal Ramp Guidelines.

II. CONSIDERATIONS FOR FISH PASSAGE

A) MAINTAIN OR RESTORE STRUCTURAL AND FUNCTIONAL CONNECTIVITY FOR FISH SPECIES (BOTH ADULTS AND JUVENILES) AT ALL ROAD-STREAM CROSSINGS. TO ACCOMPLISH THIS:

1. Design new structures at road-stream crossings to facilitate fish passage

Where practical:

a) Retain, restore or mimic the existing physical and morphological conditions in the stream and floodplain to the greatest extent possible. Use stream simulation techniques and appropriate reference reaches to guide the design and construction of new or replacement structures, with the aim of creating conditions inside the structure as similar as possible to the stream channel in both structure and function (refer to: http://stream.fs.fed.us/fishxing/aop_pdfs.html)
b) Replace a culvert with an oversized arch culvert, 3-sided box culvert, open-bottomed pipe culvert, or entrenched pipe culvert that is wide enough to prevent channel constriction by accommodating the full channel width and allow for design flows (i.e., natural substrate through culvert, bottom surface of structure should be flush with grade, no drop-offs or plunge pools, and minimize turbulence and channel constriction).
c) A bridge overpass alignment should encompass the natural floodplain, including meanders and riparian banks, and allow for minimal use of bank armoring strategies such as riprap or concrete wall bridge supports.
d) Minimize culvert length to the greatest extent possible within the natural course of the stream. Where a stream crosses an extended highway footprint and associated infrastructure (e.g., highway on/off ramps, frontage roads, adjacent developed areas), install multiple shorter culverts rather than one long culvert.
e) Minimize the degree of forced changes in flow direction, by installing a wider structure that accommodates a natural stream meander as it passes under the road or by installing a curved culvert to better preserve inlet and outlet channel alignments and to prevent bank scour, undercutting or structural failure.
f) Design culverts such that water velocity, depth and grade through the structure is consistent with upstream and downstream channel conditions.
g) Design passages with consideration of the impacts of both high and low flows on fish passage. Design velocity criteria to provide passage for the weakest swimming individual (e.g., juveniles) during a range of flow conditions.
h) Provide low-flow channels in culverts where needed by installing the invert of the culvert below the grade of the natural substrate of the stream to ensure that a minimum water depth can be preserved through the culvert as flow levels fluctuate (e.g., in streams where flow depth may seasonally drop below the minimum depth required for fish passage).

i) Decrease maximum flow velocity through a culvert as culvert length increases and provide rest areas for fish moving through the culvert.
j) Daylight long culverts as much as practically possible while providing best management practices and natural riparian vegetation for controlling for the inflow sediment and runoff from the roadway.
k) Plant and maintain native riparian vegetation at the inlets and outlets of all crossings.
l) Maintain road sand traps to prevent the siltation and pollution of streams and provide regular maintenance to prevent sediment build-up or debris accumulation at culverts.
m) Construct wetlands along the highway right-of-way wherever practical to reduce nonpoint source pollution into receiving streams and funnel roadway sediment and runoff to sediment traps or vegetated buffer areas away from stream channels.
n) Install flared end sections on culverts to reduce erosion at the inlets and outlets of water conveyance structures.

2. Retrofit existing culverts that are not due for immediate replacement to facilitate fish passage.

a) Install securely anchored baffles (corner or side) or rock weirs and provide streambed substrate inside the culvert to add roughness, reduce flow velocity, increase flow depth through the culvert, and create pools that can act as resting areas for fish moving through the culvert where flow criteria allows for reduced culvert capacity. Design baffle heights and profiles with consideration for high and low flows.
b) Install weirs to concentrate low flows into multiple pools with narrower, deeper channels where needed to ensure that a minimum water depth can be preserved through the culvert as flow levels fluctuate (e.g., in streams where flow depth may seasonally drop below the minimum depth required for fish passage). Use tailwater control weirs outside of the culvert barrel to increase flow depths in the culvert during periods of low flow.
c) Use rocks in culverts to simulate the grade-stabilizing functions of embedded debris.
d) Improve transitions at culvert inlets and outlets to accommodate for forced changes in flow direction due to skewed culverts.
e) Balance control measures by installing flared end sections or control weirs for slowing flow velocities and excessive turbulence at culvert inlets
f) Repair perched outfalls by constructing step/pool structures with natural materials to allow for aquatic connectivity. Provide a sufficient pool depth at outlets where fish have to jump to enter a culvert. Design jump height for specific species of concern.
g) Maintain culvert improvements to prevent them from becoming clogged with sediment or debris.
h) Plant and maintain native riparian vegetation at the inlets and outlets of all crossings.

3. Integrate aquatic and terrestrial connectivity goals at all road-stream crossings as appropriate (e.g., include dry pathways for terrestrial species, as needed)

a) Oversize crossing structures to accommodate both aquatic and terrestrial species.
b) Install multiple crossings at varying invert elevations that can perform as dry crossings for terrestrial species and low flow crossings for aquatic species while improving the morphological characteristics of the floodplain and allowing for increased flow capacity during high runoff events. Note that multiple structures at one site may have higher maintenance demands than a single larger structure, and the main crossing structure must be large enough to accommodate flows, sediment and debris.

4. Coordinate with the Colorado Division of Wildlife

a) Aquatic connectivity is not always desirable. Install or maintain aquatic barriers where needed to control the spread of invasive species or disease and/or to protect pure populations of native species. Likewise, remove barriers that no longer serve their intended purpose.
b) Obtain information on the types of species occupying specific streams and design the range of flow velocities, water depth and other attributes for those specific species and life stages. Where such information is lacking, unless there is an explicit need for an aquatic barrier, design road-stream crossings to facilitate fish and aquatic organism passage.
c) To determine the most cost-effective use of funds for constructing new structures or retrofitting existing structures, consider the road-stream crossing relative to the entire stream network, including how it relates to other road-stream crossings or barriers.

5. Minimize impacts to aquatic species during construction

a) Concentrate construction activities during periods of low flow to avoid critical time periods such as fish migration and spawning seasons, and to minimize direct impacts to wildlife and their habitat.
b) Minimize disturbance to the length of the natural stream channel and natural flow of water as well as to the riparian banks and vegetation, and restore areas that have been disturbed using local materials and seed.
c) Clean all equipment and gear before and after they are exposed to the stream to prevent the transmission of aquatic nuisance species or aquatic diseases into or out of the drainage.
d) Remove temporary fills and structures once construction is complete.
e) Install and maintain all best management structures to reduce sedimentation into a stream during construction and remove all temporary BMP’s once natural vegetation has been re-established.

WB I-70 Peak Period Shoulder Lane

Meeting Minutes

Project:	WB I-70 Peak Period Shoulder Lane CDOT Project NHPP 0703-445 (21893)
Subject:	ALIVE Meeting #2
Date:	January 18, 2018
Location:	CDOT Lookout Mountain Conf Room 425A Corporate Circle, Golden, CO
Attendees:	See attached sign-in sheet
Distribution:	ALIVE committee members, project file
Attachments:	Agenda, sign-in sheet

Summary of Action Items	Responsibility	Status
1. Send deicer paper to Julia	Joe Walter, CPW	In progress
2. Determine effectiveness of salt blocks to keep bighorn away from blasting during construction of the Twin Tunnels project. Will CPW approve their use in the event of blasting for the WB PPSL project?	Joe Walter, CPW	In progress
3. What concerns does CPW have regarding the use of salt lures to attract bighorn to areas away from I-70? What protocols are recommended by CPW regarding the use of lures?	Joe Walter, CPW	In progress
4. Continue coordination and education efforts with the Easter Seals Camp to ensure proper use of bear-proof garbage cans.	Joe Walter, CPW	In progress
5. Send informal WVC tracking table to Francesca	Joe Walter, CPW	In progress
6. Follow up with MT-DWF regarding soil sterilization (how and how wide of a swath) and recommended rock size or other strategies for deterring bighorn.	Julia Kintsch, ECO-resolutions	In progress
7. Determine how far back vegetation (shrubs and trees) should be cleared from pavement to increase driver visibility	Julia Kintsch, ECO-resolutions	In progress
8. Investigate adding rumble strips and bighorn sheep caution signs where the West Fork of Clear Creek runs under CR 257. Explore collaboration with CDOT, so that CDOT may implement the mitigation with County approval.	Jo Ann Sorensen, Clear Creek County	Complete
9. Investigate lowering the speed limit to 35 mph on the eastern segment of CR 257 (from west of creek crossing to US 40)	Jo Ann Sorensen, Clear Creek County	Complete
10. Pending CPW approval of use of salt lures to attract bighorn away from I-70, consult with private landowners adjacent to CR 257 and the I-70 WB on-ramp, and at the Dumont off-ramp to see if they would be willing to accommodate salt lures on their property.	Jo Ann Sorensen, Clear Creek County	In progress

Summary of Action Items	Responsibility	Status
11. Send current greenway alignment for the bridge at MP 241.8 to the group.	Jo Ann Sorensen, Clear Creek County	In progress
12. Look into instituting a bear proof garbage ordinance, particularly for new recreation-based and other businesses.	Jo Ann Sorensen, Clear Creek County	In progress
13. Determine whether the Empire I-70 WB on-ramp can be extended as a part of this project.	Vanessa Henderson, CDOT	In progress
14. Check CDOT ROW limits along the Empire I-70 WB on-ramp, i.e., how far does it go to the north and east where CR 257 starts?	Vanessa Henderson, CDOT	Complete
15. How far west on US 40 and I-70 can guardrail be added in this project?	Vanessa Henderson, CDOT	In progress
16. Investigate getting a bighorn sheep caution sign installed on CR 257 by Spring 2018	Francesca Tordonato, CDOT	Complete
17. Look at study area to determine how far we're looking into NEPA to determine what we can do, specifically around the Empire interchange and US 40.	Wendy Wallach, HDR	In progress

PROPOSED MITIGATION SUMMARY BULLET POINTS

- Issue – Bighorn Sheep Mortality:
    - Three primary locations were identified for mitigating bighorn sheep mortality: the Dumont off-ramp, the US 40 off-ramp, and the CR 257/US 40 on-ramp.
    - Magnesium-chloride is used as a deicer on I-70. In general, de-icing salts are known to attract bighorn sheep to roadsides, thereby increasing incidence of bighorn sheep mortality due to wildlife-vehicle collisions (WVC).
        - To Do: Joe to share deicer salts paper with Julia.
    - The mitigation strategy at these locations is designed to detract bighorn sheep from the immediate road sides and includes a combination of guard rail, limited vegetation removal, limited soil sterilization, addition of rocky substrate, and targeted signage. To assist in changing behavioral patterns, salt blocks may also be used temporarily to lure bighorn sheep from the roadsides, pending further investigation and approval by CPW. These mitigations should be phased at the beginning of project construction to reduce impacts to wildlife as soon as possible rather than waiting until the end of construction to implement wildlife mitigations.
    - The ALIVE Committee continues to be concerned about the possible new areas of bighorn sheep WVC due to the reduction of the outside shoulder and the resulting proximity of foraging wildlife to high speed traffic, specifically from Fall River Road to the Dumont exit. The committee will review the road design, road cuts and median and shoulder barriers relative to this concern when this information becomes available.

- Issue – Mule Deer Wildlife-vehicle Collisions
    - The committee is investigating opportunities to improve connectivity for deer and other wildlife at the bridge at MP 241.8 (west of Twin Tunnels) relative to the greenway design.
- Issue – Carnivore Dispersal and Mortality
    - The committee will review where new or higher median barriers are planned for the WB PPSL project and may recommend additional median gaps be installed to facilitate mountain lion movement and other fauna. The design would be the same as those that were installed for the EB PPSL project for large and small fauna.
    - Clear Creek County will look into instituting a bear proof garbage ordinance, particularly for new recreation-based and other businesses.
- Issue – Miscellaneous
    - Other non site specific mitigation strategies were discussed and summarized below.

MEETING DISCUSSION AND DETAILED MITIGATION RECOMMENDATIONS

Bighorn Sheep Mitigation Recommendations and Alternatives

Location Specific Mitigation:

- MP 235.3, off-ramp from I-70 at the Dumont exit:
    - Note that this area is part of Clear Creek County's Sheep Keep area.
    - Remove vegetation along the north side of the off-ramp, sterilize soils and replace with jagged, rocky substrate that is less friendly to sheep hooves, particularly along the eastern end of the off-ramp, where vehicle speeds are highest.
        - To Do: Determine appropriate method for sterilizing soils and how wide of a swath is needed for vegetation removal and soil sterilization.
        - To Do: Determine best rock size for deterring bighorn sheep along road shoulders.
        - To Do: Alternatively could limited sections of grouted riprap or other strategies be used?
    - Guardrail could be used to deter wildlife from foraging in limited locations. Install guard rail along this segment to separate vehicles from rocky roadside.
    - Recommended segments - start before off-ramp begins (near "two track" and extend to the first driveway. Alternatively, could extend guard rail all the way to the stop sign to reduce concerns regarding human safety at residences along the ramp.
    - Remove trees or large shrubs to improve driver visibility on off-ramp.
        - Public may be concerned about vegetation removal, but if removal occurs in limited area then there shouldn't be much public concern, i.e., remove vegetation only from the area between the cut slope and the two track at the base of the ramp.

        - Concern about unintended consequence that vegetation removal could actually attract some animals. But if done in conjunction with soil sterilization and the addition of rocky substrate, this should limit the attraction for other wildlife.
            - To Do: Determine how far back vegetation should be removed and define concentrated area for vegetation removal to minimize impacts.
    - Consider using lures on adjacent private properties to draw bighorn sheep away from the road pending CPW approval of use of lures and landowner permission.
        - To Do: Evaluate any concerns CPW may have about disease transmission or other issues related to the use of lures.
    - Most road kill occurs during spring, early summer and rut. Consider making signage seasonally active rather than year-round at each of the recommended locations. Install variable message signs with targeted messages and change messages seasonally to reduce driver habituation. Alternatively, install static signs with a targeted message, e.g., 'CAUTION – Bighorn Sheep on ramp next 200 yards' with flashing lights.
        - To Do: Determine whether it's possible for CDOT to put signs up sooner rather than at the end of the project. The group recommended targeting spring of 2018.
- MP 232.4, off-ramp from I-70 on to US40 at Empire:
    - CPW (Joe Walter) and Doreen Sumerlin (USFS) see bighorn through this segment, but there are no known recent wildlife vehicle collisions occurring at this area. However, this location was identified as a WVC mortality area in the CPW collar study (Huwer 2015).
    - The primary area of concern extends from where the off-ramp merges with the frontage road west onto US 40 towards Empire. Site specific recommendations include:
        - Remove vegetation along the north side of the off-ramp, sterilize soils and replace with jagged, rocky substrate that is less friendly to sheep hooves, particularly along the eastern end of the off-ramp, where vehicle speeds are highest.
        - Install guard rail along entire stretch from merge point, up around the curve on US 40.
            - To Do: determine if guard rail can be extended for this project.
        - Remove trees or large shrubs to improve driver visibility on off-ramp.
        - Remove vegetation between merge point and cut slope on north side.
            - To Do: determine how far back to remove vegetation.
        - Install warning sign at merge point with a targeted message, e.g., 'CAUTION – Bighorn Sheep on ramp next 200 yards' with flashing lights.
- West of US 40 at Empire Junction, where County Road (CR) 257 crosses over the West Fork of Clear Creek:
    - High speed traffic travels on CR 257 as the posted speed limit is 55. Speed reduction and rumble strips may mitigate the potential for WVC. Warning signs could also be considered.

        - To Do: Investigate lowering the speed limit from 55 to 35 on CR 257, particularly on the eastern segment of CR 257 (from west of creek crossing to US 40). If the speed limit can be lowered, vegetation removal will not be required.
    - Install rumble strips and targeted, seasonal signage on County Road 257 on either side of the creek crossings, e.g., 'SLOW – Bighorn Sheep Crossing' with flashing lights. Remove flip down signs outside of lambing and migration periods.
        - To Do: Investigate adding rumble strips and bighorn sheep caution signs on CR 257 and how the County can collaborate with CDOT to implement the mitigation with County approval.
    - Consider roadside tree and shrub removal to improve driver visibility, particularly around the creek crossing.
        - To Do: determine how far back to remove vegetation.
- CR 308, north side frontage road:
    - This segment is less of a concern than the other locations, but the group agreed that basic signage here might be helpful. Currently there is no stop sign.
    - Erect seasonal signage during migration periods and breeding season (Oct-Dec) when mortalities along US 40 are most likely to occur (Huwer 2015).
- MP 231.2, US 40 west side of Empire Junction, on-ramp onto westbound I-70:
    - According to Joe, 8 bighorn road kills occurred in 2017on the US 40 frontage road. Joe keeps an informal WVC tracking sheet, which may be helpful for CDOT as well.
        - To Do: Joe Walter to send informal WVC tracking sheet to Francesca Tordonato.
    - Vegetation and soil sterilization are not needed at this location because the north side of the on-ramp is all cut slope.
    - Guardrail could be used to deter wildlife from foraging in limited locations. Installation of guard rail should occur along the north side of the on-ramp beginning at the bridge over I-70 and extend as far west as possible within the study area
        - To Do: Can the on-ramp be extended in this project to give drivers more time to merge onto I-70 (i.e., a longer on ramp would allow drivers more time to see potential wildlife on the ramp around the curve before they need to look back over the left shoulder to merge into traffic).
    - Install a stop sign at the bridge interchange to stop traffic before advancing onto the on-ramp, where the guard rail ends and wildlife may be present on road
    - Install a 'Slow. Stop Sign Ahead' sign on CR 257 in advance of the stop sign.
    - Vegetation under the guard rail at this location may attract bighorn. Remove narrow strip of vegetation under the guard rail on south side of on-ramp
    - Consider using lures on adjacent private property to draw bighorn sheep away from the road pending CPW approval of use of lures and landowner permission.

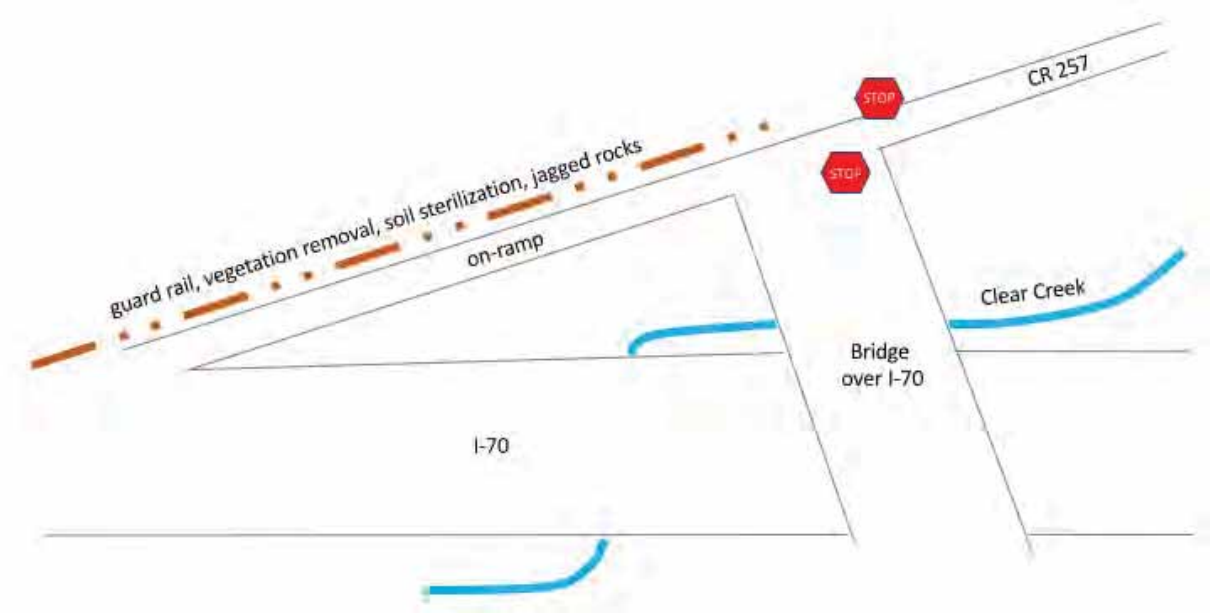


Figure: Conceptual drawing of mitigation components at MP 231.2, the Empire on-ramp onto westbound I-70.

General Mitigation Strategies:

- The biggest area of concern along the I-70 mainline is the segment between Fall River Road and the Dumont off-ramp. The ALIVE group will revisit this issue once the road design becomes available this spring
    - If the WB PPSL results in lane expansion towards the mountain the project will involve more rock cuts and rock fall mitigation.
    - To Do:
        - Evaluate where new rock cuts will occur and potential conflicts with bighorn sheep where new wire mesh will be installed to prevent rock fall.
        - Consider additional guard rail/vegetation removal/soil sterilization in segments between rock cuts.
- Phase mitigation strategies that are off the main highway alignment at the beginning of the project, rather than leaving for the end.
- Include a commitment to monitoring. Monitoring could be conducted as an internal CDOT research project or submit a research application. Monitoring should evaluate the effectiveness of these mitigation treatments in reducing bighorns sheep activity along the roadsides to inform adaptive management and future projects in other locations. How is sheep behavior affected by the mitigation over 3-5 years?

- Construction mitigation recommendations:
    - Blasting should only be permitted outside of lambing season (May - July).
        - Sheep in canyon lamb before Georgetown. Also very weather dependent. Lambing is generally May through July, but confirm with CPW prior to construction.
    - Coordinate with CPW to put attractants (salt blocks) in place to keep bighorn away from I-70 during blasting and/or install temporary fencing to keep wildlife away from blasting.
        - To Do: Determine CPW use of salt blocks to keep bighorn away from blasting during Twin Tunnels project? How effective was this?

Mule Deer Mitigation Recommendations and Alternatives

- The bridge at MP 241.8 has a dirt pathway along the east side of the river and a low-use access road along the west side. However, both pathways dead end due to the alignment of the river, riprap banks, and human development, activity and fencing.
    - To Do: Re-evaluate this location relative to the revised greenway plan – the trail will go under this bridge. Note, however, that this portion of the greenway project is under Idaho Springs' purview.

Carnivore Mitigation Recommendations and Alternatives

- Minimize highway lighting throughout the project area. Use shielded or downward lighting to minimize lighting impacts.
    - This is now standard procedure for CDOT
- Additional median and shoulder barriers are likely in this project.
    - To Do: Once barriers data is available for the project, determine where additional median gaps could be added, e.g., to coincide with where drainages are bisected by I-70. If they are little cost, wouldn't hurt to add more median gaps.
- The Easter Seals Camp near Empire Junction has begun using bear-proof garbage cans to reduce conflicts with bears and minimize bear attractants around the highway and frontage road. However, proper usage of the garbage cans has not been consistent.
    - To Do: CPW continue coordination and education efforts with the Camp.
    - To Do: Look into instituting a bear proof garbage ordinance, particularly for new recreation-based and other businesses, either county-wide or focused around Dumont, Downieville and Idaho Springs.

NEXT ALIVE MEETING (LIKELY APRIL/MAY 2018)

- Need road design/road footprint, rock cuts, median and shoulder barriers information for this meeting.
- Review:
    - Segment from Fall River Road to east of Dumont relative to road design and new rock cuts for bighorn on the north side of I-70.
    - Greenway plan and opportunities for wildlife connectivity at bridge at MP 241.8
    - Consider additional median gaps for mountain lions and other wildlife (lions have random movements, cross throughout the project area, and do not hesitate before crossing per Joe Walter)

WB I-70 Peak Period Shoulder Lane

ALIVE ISSUES TASK FORCE MEETING

January 18, 2018, 9:00–11:30
CDOT Lookout Mountain Conf Room
425A Corporate Circle, Golden

AGENDA

Meeting objective: Achieve consensus on wildlife mitigation solutions for the WB PPSL project.

1. Introductions

2. Review action items from the last ALIVE meeting

3. Review mitigation issues and alternatives

WB I-70 Peak Period Shoulder Lane

SIGN-IN SHEET

ALIVE ISSUES TASK FORCE MEETING

January 18, 2018, 9:00–11:30
CDOT Golden Lookout Mountain Conf Room

SIGNATURE	NAME	AGENCY	E-MAIL ADDRESS
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	Wendy Wallach	HDR	wendy.wallach@hdrinc.com

ALIVE/SWEEP CONCEPT WORKSHOP MEETING

April 10, 2018

Summary of Action Items	Responsibility	Status
1. The project team will create and share a graphic that shows the elements in the SCAP versus what is proposed in the Conceptual Plans and share with the County. (SWEEP)	HDR	Complete
2. CCC will review the above graphic and provide input for each pond in regards to its desirability when comparing visual and water quality impacts. (SWEEP)	Jo Ann and Cindy	
3. Address CCC's desire to include a plan to deal with Lawson sediment basin as part of PPSL. (SWEEP)	HDR	
4. Integrate concerns about sediment ponds acting as wildlife attractants into the siting and design of sediment ponds, e.g., consider a vault design rather than a traditional pond or wetland where they are likely to attract wildlife to the road sides or across the frontage road. (ALIVE)	HDR/Julia	
5. Determine if Idaho Springs can remove fencing. It may already be planned for removal to accommodate the Greenway. Opening up the fence on this side of the river to make this area more accessible for wildlife would help. (ALIVE)	Neil	
6. Julia to check wall and median heights relative to proposed median gap locations. Not all locations are likely to be suitable for scuppers for small mammal passage. (ALIVE)	Julia	
7. Evaluation of ALIVE recommendations (update matrix).	HDR/Julia	
8. Add station numbers to ALIVE matrix.	HDR/Julia	

SWEEP Discussion

1. Sandy handed out the Action Item Log from the first SWEEP meeting and indicated CDOT had completed all action items.
2. Sandy noted per the Conceptual Plan there are no direct impacts to the surface waters or wetlands anticipated.
3. Per discussion with Paul Winkle at CPW (as an Action Item from SWEEP Meeting #1) there are no genetically pure greenback cutthroat trout in this stretch of Clear Creek. Also, there are no large spawning areas, but instead they are diffuse and spread along the entirety of Clear Creek as smaller pockets of spawning habitat.
4. The improvements on westbound I-70 for the WB PPSL will result in approximately 7.5 acres of additional impervious surface. The Conceptual Plans include 9-10 sediment ponds which will treat approximately 5 acres of runoff.

5. Cindy Neely asked if the SCAP was developed to account for future conditions or existing conditions. Kevin Shanks noted it addressed the existing conditions at the time (2013).
6. Cindy asked if the sediment ponds go above and beyond the SCAP.

   Response: Yes, in regards to sediment ponds. There are additional ponds recommended. This provides a water quality benefit and offsets the likelihood that inlet basins will not be used. The inlet basins require more frequent maintenance and specialized equipment and are therefore not the preferred method of treatment. Also, CDOT it trying to use less sand as a traction control, which is the primary constituent that inlet basins treat.
7. Clear Creek County (CCC) compared the proposed SCAP recommendations against the conceptual plans, they do not match.

   Response: This is correct, CDOT has proposed additional sediment ponds than proposed in the SCAP to be able treat more roadway runoff. Also, some SCAP-identified ponds are not in the best spot to treat. In addition, the project is only looking at onsite rather than offsite because of the interim nature of the project.
8. CCC noted concerns with the first five ponds (starting at Empire Junction) as these ponds occur in open areas and would therefore result in visual impacts. CDOT noted that aesthetic treatments or different treatment types could be examined.
9. CDOT explained that the sediment ponds were located where they provided the greatest amount of treatment of roadway runoff, balanced with ease of construction and long-term maintenance.

   Action Item: The project team will create and share a graphic that shows the elements in the SCAP versus what is proposed in the Conceptual Plans and share with the County.

   Action Item: CCC will review this graphic and provide input for each pond in regards to its desirability when comparing visual and water quality impacts.
10. CDOT noted that in addition to the sediment ponds, the project would implement a standard suite of mitigation measures during construction, including obtaining a stormwater permit, developing a stormwater management plan, and developing a material management plan.
11. CCC asked about the existing pond at Lawson, located south of I-70. CDOT indicated that fixing this pond will occur as part of the WB PPSL.

ALIVE Discussion

1. Julia reviewed the mitigation recommendations from the previous meetings, adding that Bighorn sheep mortality is a critical issue. Because this is an interim project we can't address permeability by adding crossings. The team reviewed a range of mitigation measures that, when combined, could decrease vehicle-caused mortality along the road sides and on/off ramps by simultaneously detracting sheep from roadway while attracting them to areas away from the road.
2. Salt Blocks and Salt Lures-This is not a feasible option as it may spread disease. Joe Walter (CPW) said recently they tested a deceased bighorn sheep and tests came back positive for pneumonia. He confirmed this isn't a feasible option.
3. Soil Sterilization was considered to decrease attractiveness but the chemicals would have an impact to water quality, and therefore this was not considered feasible.
4. Addition of Guardrail could decrease mortality in conjunction with other measures decreasing roadside attractiveness. Julia said that adding this partial barrier—particularly alone without other complementary measures—could have the unintended consequence of trapping animals on the pavement side of the guard rail.

5. Vegetation Removal, including grasses, shrubs and trees, was considered at select locations to decrease attraction to the road and improve visibility for drivers. Vegetation will be removed at select locations including:
6. Dumont off-ramp at STA 370 to 375/Sheet 15 (8' deep removal swath)
7. Off ramp towards Empire at US 40, this is more on county road, it's where off-ramp merges with frontage road on Sheet 4. This is the area between merge points and cut slope, where there are trees adjacent to roadway. Julia didn't want tree removal to be quite as deep so she recommended removal of a 5 foot swath from the edge of pavement.
8. The third location is the westbound on-ramp from Empire onto I-70 where the highest number of sheep mortality occurs. On south side of on-ramp, there is a triangle of vegetation between the on-ramp, Clear Creek and the 308 bridge. Sheep cross the on-ramp to access the creek and vegetation on this south-facing slope. It is shown on Sheet zero right where the design crosses I-70. At this location the driver is speeding up on the westbound on-ramp around a curve and looking over their left shoulder in preparation to merge onto I-70 in the same a
9. re where sheep area crossing on-ramp. Joe said that 50% of sheep mortalities from wildlife-vehicle collisions occurred around this on-ramp. Joe said there are multiple issues at this location including the speed on road.
10. A stop sign for westbound traffic at the 308 bridge and speed reduction on CR 257 were considered. Julia thinks reducing speed won't be effective unless combined with other traffic calming measures, such as the stop sign, as well as enforcement measures. Julia said speed control measures have greatest potential to reduce bighorn mortality. A traffic analysis would need to assess the potential to reduce speed and the possibility to put a stop sign there, or any other traffic calming measures that may be feasible.
11. Steve Harrelson said it is unusual to recommend an adjustment because it needs to address safety; generally, a speed limit can't be reduced unless 80% of drivers are driving at that speed. However, wildlife-vehicle collisions are a safety concern at this location. He will talk to the traffic engineers to see how to address this for animals. A number of frontage roads labeled county roads but they are actually state owned and agreements should be reexamined.
12. Cindy added we need to consider driver expectation; drivers are not expecting to see sheep around a corner on the ramp. Drivers are looking to merge on their left and sheep come from the right.
13. Targeted, seasonal signage is suggested for CR 257, just east of the 308 bridge. Francesca Tordonato (CDOT) is working on this now but drivers get habituated and signage alone is not effective. Steve H. said we should look at a roundabout; Julia encouraged CDOT to explore options for this location.
14. At County Road 308, between Lawson and Dumont, where frontage road is located on the north side of I-70, the animals cross CR 308. Julia said she is concerned about sediment ponds near this location because they are wildlife attractants. The ponds are located between the county road and interstate, so we should coordinate various interests.

    Action Item: Integrate concerns about sediment ponds acting as wildlife attractants into the siting and design of sediment ponds, e.g., consider a vault design rather than a traditional pond or wetland where they are likely to attract wildlife to the road sides or across the frontage road.

    Action Item: Add to SWEEP actions.
15. Might need to put this in with the SWEEP actions
16. Julia said if drainage can be designed as a vault, wildlife are likely to be less attracted to them. She is also concerned about the addition of the sediment pond on the west side of Twin Tunnels because it could be a bighorn attractant. Joe from CPW said in Empire Junction, three moose have been hit. He is more worried about safety concerns with moose. He said if roadside attractants can be reduced it would be beneficial because wildlife in general move along water corridors.

17. Cindy said reference to remove fencing refers to the chain link fence on the northwest side of the bridge at MP 241.8. The fence belongs to Idaho Springs and Jo Ann thinks construction materials are being held down there.
18. **Action Item:** Determine if Idaho Springs can remove fencing. It may already be planned for removal to accommodate the Greenway. Opening up the fence on this side of the river to make this area more accessible for wildlife would help.
19. Addition of Gravel Substrate in conjunction with vegetation removal was considered. If we remove vegetation, it will be replaced by weeds which attracts bighorns. Steve H said deicer permeates through the gravel in that area. Joe said that sheep will still dig down because that is how they sharpen their horns.
20. Julia also looked at mitigation for carnivores; it includes using shielded lighting which is standard but meets minimum requirements so there is less light.
21. If we increase the number of median walls, Julia recommends increasing gaps beyond what is shown in design. They need to be at least 10 feet long and have reduced wall heights and include scuppers. Julia said adding information on the wildlife median gaps would be beneficial. She also recommended a gap near the sediment pond at Station on 402 and one west of Spring Gulch Road.
22. **Action Item:** Julia to check wall and median heights relative to proposed median gap locations. Not all locations are likely to be suitable for scuppers for small mammal passage.
23. Cindy said the median is shown as a wall that is as high as 8 feet in some places. Julia said median wall gaps would not be a “panacea” for all, but could help an occasional carnivore to cross the interstate. The team committed to reexamining Julia’s suggestions.
24. Cindy asked if there was a high wildlife mortality rate west of Empire. Joe from CPW said no.
25. Joanne said the area shown in Sheet 23 is located within the Linkage Interference Zone (LIZ). This was in the 2004 LIZ data, not in the 2011 update. The Fall River LIZ was removed in 2011 and the ALIVE Group had agreed to use the 2011 updated LIZ for this project. Joe from CPW said there aren’t many animals in this area.
26. One recommendation was to revisit education at the Easter Seals Camp to improve practices. CPW said it is statewide problem, Jo Ann will look at adding regulations to the newest county plan.
27. Doreen and Alison both agreed these are our options at this point. Jo Ann said we addressed her primary concerns.
28. Jo Ann said there are a number of places along WB I-70 where drainage is coming off towards county roads at the NE corner of intersection in Downieville on Sheet 11. She thinks it is being patched by adding asphalt and it doesn’t address the issue. Steve H will talk to maintenance.
29. **Action Item:** Send out figure showing proposed SCAP proposed, where the SCAP was incorporated, and additional sediment ponds.
30. **Action Item**: Address CCC’s desire to include a plan to deal with Lawson sediment basin as part of PPSL.
31. **Action Item**: Evaluation of ALIVE recommendations (update matrix).
32. **Action Item**: Add station numbers to ALIVE matrix.

COLORADO
Department of Transportation
Region 1
West Program
425A Corporate Circle
Golden, CO 80401

Project No: NHPP 0703-445
Project Code: 21893

I-70 Westbound Peak Period Shoulder Lane (PPSL) ALIVE Meeting Minutes 7/13/18

Attendees: See Sign-In Sheet

1. Introductions
2. Purpose of the Meeting
    a. The purpose of this meeting is to review a roll plot depicting the recommended mitigation measures that can be implemented. The group will review those mitigation measures proposed to be implemented and those which have been eliminated. This is the fourth ALIVE meeting and the intent is to reach agreement on final mitigation measures. The attached matrix documents the proposed recommendations.
    b. Mitigation measures were recommended in conjunction with one another (e.g vegetation, guardrail and gravel substrate). When we looked at these combined mitigation measures, only some of them could be implemented and therefore were not effective and were eliminated. Guardrail presented the potential to be a safety hazard and would also not work with the interim nature of the project.
    c. The team considered mitigation measures which attract animals away from the road, for example salt blocks. These measures had unintended consequences as noted in the ALIVE Recommendations Matrix and the group felt these consequences made attractant mitigations infeasible.
    d. The group reviewed the remaining mitigation measures on the roll plot from west to east.
3. Big Horn Sheep Mortality
    a. West side of Empire Junction (US 40) on ramp to West I-70 (at intersection with bridge to Easter Seals)
        i. The WB on-ramp is an identified mortality hotspot for bighorn sheep through a collar study and observations from Colorado Parks and Wildlife (CPW).
        ii. The project team and ALIVE group would like to implement a stop sign to slow down motorists more and address sight distance issues with the curvature at the on ramp. There is already a big horn crossing sign between Station 185 and 190 at this location. Advance warning signage is also being recommended to warn travelers of the proposed stop sign.
        iii. Concerns with implementation of the stop sign regarding vehicular safety and traffic were identified during analysis. For a stop sign to be warranted at this location, it must meet a threshold of five accidents in a 12 month period. The

2017 CPW data shows three crashes at this location in the last year. Julia recommended the team review the data from the Huwer Collar Study which identified this as the number one hot spot for collisions and see if crash data could be extrapolated for this information. UPDATE: The traffic analysis has indicated that the stop sign is not warranted and is not able to be installed.

iv. CPW (Joe) is not aware of any 2018 carcass removal at this location. Most available crash data is for the mainline and wildlife vehicles collisions can't be isolated but may include WVCs.

v. Joe asked if there was potential to lower the speed limit of 55. This would require enforcement because this is a learned behavior for drivers. A speed study would need to be conducted and it would be difficult to have this information by the time NEPA is completed as the study process can be lengthy. The USFS (Doreen) recommended the speed study be started now and be implemented at a later date. UPDATE: Since the ALIVE meeting, CDOT Traffic has informed the project team that the speed limit will be lowered to 45.

b. Off ramp from I-70 to US 40 at Empire (where on-ramp merges with CR 308)

i. Seasonal signage is recommended. Seasonality is to be determined, likely April through November beginning with the growth of spring vegetation near the creek crossing and the CDOT maintenance facility.

ii. USFWS (Alison) asked if a portable VMS could be included; CDOT has been successful with using portable VMS during peak activity season. CDOT is concerned about available funding to implement the required fiber optic for a permanent sign. An alternative could be to add flashing beacons with solar power so it is not static.

iii. CDOT (Francesca) is concerned if there is the necessary clearance from the roadway for a VMS and about the consistent application of seasonal signage.

c. The group wants components of the packages like the stop sign to be delivered first.

4. I-70 to Dumont

a. Minimal vegetation removal is being recommended at the Dumont off ramp to I-70 the off ramp begins is identified as a hot spot for big horn in the Huwer study. Vegetation and shrubs will be removed to reduce attractants in an approximate area 30 feet in length and 5 to 8 feet wide.

b. Francesca said removing shrubs may "open up" the area allowing for additional grass to grow and act as an attractant and could have opposite effect.

c. The group concurred that this mitigation measure be removed from the plan.

5. Corridor Wide

a. Barrier types and median gaps

i. Barrier types and rails are shown in the median. Long stretches of barriers and retaining walls can result in wildlife vehicle collisions. Corridor stakeholders

recommended a concrete barrier to address concerns about strobe light effects on drivers. To mitigate this barrier effect, the team is showing four median gaps locations based on the lengths of median barriers and other features. Gaps are adjacent to drainages when possible (Spring Creek, near Fall River and other drainages) and locations correspond with station numbers on the attached spreadsheet.

ii. The group discussed the need for additional barrier gaps and worked together to identify four additional barrier gap locations at stations 402, 409, 440 and 530, for a total of 8.

iii. Doreen said providing better visibility for animals to go over if they are too little to jump and cannot go through the gap is important. The barrier on the WB retaining wall is cantilevered five feet higher than eastbound lanes so visibility is an important consideration for animals.

iv. Scuppers are being provided as part of drainage (cut out holes in barrier). This would allow for small animals to cross, however, it won't help with the wall drop off.

b. Sediment Basins

i. There is a concern that the open sediment ponds attract wildlife. However, several of the initially proposed ponds have been removed (e.g., on the west side of the Veterans Memorial Tunnels), eliminating most of the concern. Proposed sediment ponds at stations 240 and 250 may attract wildlife to cross the north side frontage road (CR 308) west of Lawson.

ii. The three proposed sediment pond locations include the area inside the US 40 interchange (Station 188) and two located near the crossing beneath the highway at Lawson (Stations 250 and 240).

iii. Several of the ponds proposed near MP 220 have been removed eliminating most of the concern about attracting wildlife.

iv. Doreen asked if the new ponds do attract wildlife if monitoring at these locations is an option. Joe thinks they would cross the creek to the proposed locations regardless if the ponds are there.

c. Rock fall mitigation

i. Mesh mitigation used in areas for rock fall can be hazardous for raptors. In two instances CDOT has documented raptors becoming trapped in the rock fall netting. Julia reviewed research which revealed raptors can get in and then get back out through at the top if there is an opening. Mesh can also be applied very tightly to ensure raptors cannot access the rock fall areas from the top. Julia said we should use four inch mesh size to deter birds getting trapped, unless it is mandatory to have smaller mesh size.

d. Other

i. Fencing – Removal of fencing is recommended on east side of Idaho Springs where Clear Creek goes under I-70. At this location there is an access road with chain link fence creating barriers for mule deer migration. CDOT (Neil) contacted Idaho Springs to discuss fence removal. The fence can be removed as

long as the gate is maintained.

ii. Lighting - Downward facing lights will be included to minimize illumination.

iii. Education - Continuing education will occur at Easter Seals camp for usage on bear proof containers.

6. At the conclusion of the meeting, the ALIVE committee concurred that the stop sign and speed study are of biggest concern to this group.

7. Next Steps/Action Items

   a. CPW will look for additional information and data regarding big horn mortality at the US 40 on-ramp to help support the stop sign.

   b. Julia will explore the ability to use extrapolated data from the Hewer Collar Study. (Note: Julia has provided this information to the Apex design team).

   c. Apex and CDOT will coordinate on the stop sign to provide a recommendation.

   d. CDOT will meet with staff traffic to consider conducting a speed study and reduction of the speed limit for the US 40 to WB I-70 on-ramp (NOTE, no longer needed). The team will also consider including an advanced warning sign, portable Variable Message Signs (VMS) and rumble strips to lower the risk if a stop sign and lower speed limit can be implemented. Rumble strips will need to be evaluated so there is not disturbance to the local residents.

   e. CDOT (Francesca) to explore portable VMS sign as a way to alert motorists to stop sign and big horn warning signs.

   f. HDR to eliminate vegetation removal from the plans at the Dumont off-ramp.

   g. HDR to include the additional four recommended barrier gap locations in design plans. New recommendations include at STA 402, 409, 440 and 530, for a total of 8.

   h. CDOT will make a determination on location and type of sediment basins during a meeting with hydraulics in a couple of weeks.

WB I-70 Peak Period Shoulder Lane

SIGN-IN SHEET

ALIVE ISSUES TASK FORCE MEETING

July 13, 2018, 9:00–11:00

Lookout Mountain Conf Room | CDOT Golden Campus, 425A Corporate Circle

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