

EAGLE COUNTY SAFE PASSAGES FOR WILDLIFE

Phase II Wildlife Connectivity Assessment

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**Report to Eagle County Government,
Sustainable Communities Department**

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Many agencies, organizations and community members convened to make this project a successful collaboration. Eagle County and Eagle Valley Land Trust initiated the project and funding was provided by Eagle County government. Additional partners include Colorado Department of Transportation, Colorado Parks and Wildlife, USDA Forest Service, Bureau of Land Management, Pitkin County Open Space and Trails, Town of Vail, Town of Eagle, Town of Avon, Town of Basalt, Eagle County Conservation District, Walking Mountains Science Center, Wilderness Workshop, Roaring Fork Conservancy, Vail Resorts, Battle Mountain, Vail Valley Mountain Bike Association, and local citizens.



Stakeholders participating in a site visit. Photo courtesy of Eagle Valley Land Trust.

EXECUTIVE SUMMARY

The objective of Eagle County Safe Passages for Wildlife is to create a common vision that identifies and prioritizes important wildlife movement areas and highway crossing zones in Eagle County. Specifically, Eagle County Safe Passages for Wildlife:

- **Identifies important wildlife movement areas and highway crossing zones** based on existing data and expertise;
- **Recommends the best locations for crossing structures** for different types of wildlife to integrate wildlife-highway mitigation into transportation projects and raise funds for stand-alone projects;
- **Provide land use and land management guidance** for the purpose of influencing planning, permitting, recreation/trails development, public lands management, and private land conservation.

To achieve these objectives, stakeholders representing a variety of entities and interests were assembled, including state and federal transportation and natural resource agencies, local governments, ski areas and non-profit partners such as Eagle Valley Land Trust and Walking Mountains Science Center.

Using available data and habitat connectivity models developed in the Phase I Connectivity Assessment, this stakeholder group identified roadway segments of concern relative to the value of cross-roadway movements to wildlife and the risk to drivers of wildlife-vehicle collisions. A set of scoring criteria were developed to distinguish priorities among the identified highway crossing zones.

The Tier 1 prioritization encompasses both wildlife and safety considerations – combined, these criteria define *the need for wildlife-highway mitigation*.

The Tier 2 prioritization includes criteria that *affect the likelihood of wildlife-highway mitigation*, specifically, threat urgency, land security, mitigation feasibility and mitigation opportunity.

Twenty-five wildlife-highway linkage areas were identified across CDOT highways and major county roads in Eagle County. Site visits were conducted in each of these areas to identify potential mitigation opportunities, such as wildlife crossing structure over or under the road. A second round of site visits was conducted with CDOT engineers and other stakeholders to further refine and assess mitigation feasibility. For each linkage area, the final report details preliminary recommendations for reducing wildlife-vehicle collisions and protecting or restoring wildlife movements across the landscape. These recommendations may include,

- **Constructing dedicated wildlife crossing structures** in conjunction with 8'-high wildlife exclusion fence to reduce wildlife-vehicle collisions while improving safe passages for wildlife.
- **Removing unnecessary right-of-way fencing** or replacing it with wildlife friendly alternatives.
- **Pursuing compatible land use and land management** in wildlife movement corridors.

Summary of key wildlife-highway mitigation recommendations and conservation actions in the ten highest priority linkage areas in Eagle County. Estimated relative costs are included in parenthesis. Near-term implementation priorities identified by the stakeholder group are highlighted green.

Priority Rank	Linkage Name	Mileposts	Wildlife Need	Safety Need	Select Mitigation Strategies
1	SH 131, Wolcott to State Bridge	1-14	High	Very High	<ul style="list-style-type: none"> Remove right-of-way fence; where needed replace with wildlife friendly fence [\$\$] Construct multiple wildlife crossing structures and wildlife exclusion fencing [\$\$\$\$]
2	I-70, West Vail Pass	182.5 – 190	Very High	Medium	<ul style="list-style-type: none"> Construct wildlife crossings for large fauna and wildlife exclusion fence between MP 187 – 190; Coordinate with the West Vail Pass Auxiliary Lanes Project [\$\$\$\$] Coordinate with CPW and the Forest Service to manage human activity [\$]
3	I-70, Horn Ranch	153 – 154.5	High	High	<ul style="list-style-type: none"> Repair wildlife exclusion fence [\$\$] Pursue land conservation and/or zoning measures to limit development [\$\$-\$\$\$\$] Construct a wildlife crossing structure around MP 153-154 [\$\$\$\$]
4	I-70, Mud Springs	169.5 – 173	Very High	Medium	<ul style="list-style-type: none"> Extend and improve the wildlife exclusion fence alignment to prevent animal incursions into the fenced right-of-way [\$\$] Replace the Mud Springs box culvert with a span bridge or large culvert; investigate additional crossing structure opportunities, e.g., MP 170.5 [\$\$\$\$]
5	I-70, Van Campen’s	148 – 152	Medium	High	<ul style="list-style-type: none"> Remove barbed wire fencing; replace with wildlife-friendly fence where needed [\$\$] Replace the box culvert at MP 149.8 with a wide bridge underpass suitable for elk and other wildlife passage [\$\$\$\$]
6	I-70, Cottonwood Creek	143 – 144	Medium	High	<ul style="list-style-type: none"> Coordinate with land owners and land managers to ensure compatible land use [\$] Improve the fence ends at the Eagle interchange to minimize wildlife incursions into the fenced right-of-way; survey the fence for other gaps and make repairs [\$\$]
7	SH 82, Emma	18 – 23	Medium	High	<ul style="list-style-type: none"> Replace culvert at MP 22.1 with a wide underpass or construct a wildlife overpass at MP 22.2 [\$\$\$\$]; create wildlife pathways under the bridge at MP 21.1 [\$\$] Make wildlife exclusion fencing continuous and control all gaps at driveways and access roads with deer guards [\$\$\$]
8	US 24, Camp Hale	153.5 – 166	High	Low	<ul style="list-style-type: none"> Coordinate with the Forest Service to determine sustainable recreation management guidelines [\$] Coordinate with Eagle River restoration to tie habitat improvements to recreation use restrictions at Camp Hale [\$]
9	US 6, Arrowhead to Squaw Creek	163.5 - 169	Low	High	<ul style="list-style-type: none"> Limit development along the Eagle River, e.g., Eaton Ranch [\$\$-\$\$\$\$] Remove barbed wire fencing on open space lands along the Eagle River corridor [\$\$] Implement traffic calming measures along select segments [\$\$-\$\$\$\$]
10	I-70, Wilmore Lake	157.5 – 163	Medium	Medium	<ul style="list-style-type: none"> Improve the fence ends at the Edwards interchange to minimize wildlife incursions into the fenced right-of-way [\$\$] Improve wildlife fencing and maintain functionality of the bridge over the Eagle River at MP 158.8 [\$\$]

GLOSSARY & ACRONYMS

CDOT: Colorado Department of Transportation

Connectivity: A conceptual measure of the degree that landscape elements facilitate or impede the movement of organisms and the flow of ecological processes, i.e., the degree to which the landscape is permeable to wildlife movement.

CPW: Colorado Parks and Wildlife

FHWA: Federal Highway Administration

GIS: Geographic Information System

Habitat Fragmentation: The division of natural habitat blocks into smaller, discontinuous pieces. Habitat fragmentation has been identified as a major threat to biodiversity worldwide.

Habitat Permeability: Synonymous with 'connectivity'. Habitat permeability refers to the ability of a species to move across the landscape. Habitat permeability varies across species depending on their movement capabilities and tolerances or sensitivities to features in the landscape (natural or human-made).

Linkage Area: Local or regional connections that facilitate to varying degrees animal movements between different sections of a landscape. A linkage area may provide connectivity for daily movements within a seasonal range; migratory movements between seasonal ranges; or dispersal movements from an animal's natal area to new territories. Linkage areas in this report are ranked first by the importance of the connection that they provide to wildlife populations and the hazard that wildlife movement presents to drivers and, second, by the economic, logistical and structural feasibility of the recommended improvements.

Linkage Interference Zone (LIZ): A term developed by a group of interagency stakeholders along the I-70 Mountain Corridor (the ALIVE

Committee) to denote highway segments of concern with regards to wildlife movement and wildlife-vehicle collisions on I-70. Later work on I-70 to refine and revise these priority segments continued use of this term.

Wildlife Corridor: A suitable habitat connection connecting two or more blocks of core wildlife habitat. Corridors are generally conceived as discrete, linear connections.

Wildlife-Highway Crossing Zone: Segments of roadway where wildlife preferentially attempts crossing.

WVC: Wildlife-vehicle Collision. Vehicular collisions with wildlife may be reported to law enforcement and compiled as accident reports (crash), but many go unreported for a variety of reasons. CDOT Maintenance patrols submit WVC reports when wildlife carcasses are cleaned off the road. WVCs typically result in wildlife mortality.

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INTRODUCTION

PURPOSE AND NEED

The objective of Eagle County Safe Passages for Wildlife is to create a common vision that identifies and prioritizes important wildlife movement areas and highway crossing zones and provides guidance for protecting wildlife movement to inform land use and land management in Eagle County. Specifically, Eagle County Safe Passages for Wildlife:

- Highlights and prioritizes road segments for wildlife-highway mitigation and offers preliminary mitigation recommendations;
- Recommends opportunities for near- and long-term capital improvements to provide safe passages across roads in Eagle County while reducing wildlife-vehicle collisions (WVC);
- Identifies road segments that currently experience low rates of WVC but may become areas of concern in the future.

While this effort was focused on identifying wildlife-highway conflict areas, it is also recognized that a connected landscape requires permeable habitat throughout wildlife movement areas and on either side of a roadway, as well access to seasonal and other habitat areas. Accordingly, the Eagle County Safe Passages Plan seeks to support the integration of wildlife movement needs into transportation projects, land use planning and permitting, and land management across the county.

This study sets the stage for the Eagle County to work in collaboration with the Colorado Department of Transportation (CDOT), Colorado Parks and Wildlife (CPW), Bureau of Land Management (BLM), U.S. Forest Service (USFS), adjacent counties (e.g., Summit, Pitkin), towns, ski areas and other stakeholders, including non-profit partners such as Eagle Valley Land Trust and Walking Mountains Science Center towards this common vision.

BACKGROUND: PHASE I CONNECTIVITY ASSESSMENT

In 2015-2016, Eagle County and ECO-resolutions conducted a wildlife connectivity assessment to identify areas that provide habitat connections for wildlife movement across roads in Eagle County (Phase I). The continuation of this study (Phase II) involves broader stakeholder engagement to refine and prioritize wildlife-highway crossing zones and develop specific recommendations for creating safe passages for wildlife. In Phase I the original study scope was expanded beyond Interstate 70 to include all state-administered roads (I-70, US 24, State Highways 131 and 82) and Brush Creek Road.

Per the recommendations of the Phase I assessment, Phase II was designed to address the following needs:

- Broader stakeholder review and participation and incorporating other data and local/expert knowledge;
- Include other county roads: Cottonwood Pass Road, Gypsum Creek Road and Colorado River Road;
- Prioritize among identified highway segments and develop milepost-specific wildlife-highway mitigation recommendations;
- Identify opportunities and needs for compatible land use and land management in wildlife movement areas.

EAGLE COUNTY SAFE PASSAGES FOR WILDLIFE: PROJECT GOAL

To create a common vision that identifies and prioritizes important wildlife movement areas and highway crossing zones and provides guidance for protecting wildlife movement to inform land use and land management in Eagle County.

METHODS

The identification and prioritization of wildlife movement areas and highway crossing zones in Eagle County was the result of a multi-phase process. Phase I (previous report) consisted of a habitat linkage analysis in a geographic information system (GIS) and stakeholder meetings. The GIS analysis provided a standardized framework for initial identification and delineation of habitat linkages across roadways for select focal species. This analysis process was valuable for systematically mapping highway crossing zones as well as adjacent habitat parcels that comprise the broader linkages between core habitat areas. Stakeholders and local experts then reviewed the modeled linkage areas and refining the linkage analysis based on on-the-ground expertise. Detailed methods and results are available in the report, *Eagle County Wildlife Connectivity Assessment: Phase I, Identification of Habitat Linkages Across Major Highways* (Kintsch & Singer 2016).

Phase II (this report) expanded upon the findings in the Phase I report by integrating additional data sources and broadening stakeholder engagement to refine and prioritize wildlife-highway crossing zones and to develop more specific recommendations for improving or restoring safe passages for wildlife across Eagle County's major roads and in the adjacent landscape. Because additional roads were added into the analysis in Phase II (Colorado River Road, Cottonwood Pass Road, and Gypsum Creek Road) the GIS-based habitat linkage analyses were also conducted for these roadways. The objects of this project were to:

1. Identify important wildlife movement areas and highway crossing zones based on existing data and expertise
2. Recommend the best locations for crossing structures for different types of wildlife and influence capital improvements to integrate wildlife-highway mitigation into upcoming transportation projects and to raise funds for stand-alone projects
3. Provide land use and land management guidance for the purpose of:

- Influencing planning, permitting, recreation/trails development, public lands management, and private land conservation
- Including connectivity as one of multiple values informing decision-making
- Aligning efforts across jurisdictional boundaries

STAKEHOLDERS

A stakeholder group composed of agencies, local governments, industry, non-governmental organizations, community groups and other interested citizens was convened to oversee the identification and prioritization of wildlife-highway linkages and to contribute expert and local knowledge to the process. Additional members were added to the group over time, representing new interests or geographic areas. See Appendix A for a complete list of stakeholder participants.

Multiple meetings were held at key points in the plan development process:

- Kickoff meeting, September 21, 2017
- Two day-long expert workshops to map wildlife-highway linkages and to review the habitat linkages identified in the Phase I process, November 8 & 9, 2017
- Prioritization criteria and scoring meeting, March 13, 2018
- Prioritization criteria and scoring follow-up conference call, May 14, 2018
- Stakeholder site visits to evaluate mitigation strategies, challenges and opportunities in the highest priority wildlife-highway linkages, July 12 & 17, and August 13, 2018
- Final plan review meeting and next steps, October 11, 2018

Additional reviews and feedback were conducted over email.

COMPILATION OF EXISTING DATA AND PHASE I HABITAT LINKAGE ANALYSES

Existing datasets were compiled to support this planning effort, including species habitat mapping and mortality from Colorado Parks and Wildlife (CPW); wildlife-vehicle collision (WVC) accidents reported to law enforcement; WVC carcass reports from the Colorado Department of Transportation (CDOT); a regional analysis of lynx highway crossing areas (Baigas et al 2017); lynx linkage areas, lynx landscape analysis units and Forest roads and trails from the Forest Service; and existing infrastructure (roads, bridges and culverts) from CDOT. Graphs depicting reported WVC accidents and recorded carcass pickups were prepared for each roadway where these data are available, namely, CDOT administered highways. These graphs are available in Appendix B.

Detailed methods describing the habitat linkage analyses conducted in Phase I and Phase II across state highways are provided in the Phase I report (Kintsch & Singer 2016).

STAKEHOLDER IDENTIFICATION OF HIGHWAY CROSSING ZONES

The stakeholder group convened via a series of sub-groups based on geography to identify wildlife-highway linkages during a series of expert workshops. The group identified elk, mule deer and Canada lynx as the primary target species. Secondary target species include bighorn sheep, black bear, moose, mountain lion and pronghorn.

Stakeholders reviewed maps and information based on the compiled datasets and the habitat linkage analyses. This information combined with local knowledge and expertise was used to delineate highway crossing zones. For each identified highway crossing zone, the stakeholder groups delineated the milepost extents of the zone; identified target species, habitat types, and land uses; defined the value of the linkage area to the target species (e.g., local, seasonal or dispersal movements); identified features that impede or facilitate wildlife movement through the linkage; and

identified current or potential future threats to wildlife movement through the linkage area. The complete wildlife linkage form used for this process is available in Appendix C.

FIELD ASSESSMENT OF HIGHWAY CROSSING ZONES

The consultant team conducted a field verification of the identified highway crossing zones in December 2017 to further define and describe these areas. During these site visits, the consultant team also began identifying potential highway mitigation opportunities to provide safe passages for wildlife, including new wildlife crossing structures (e.g., wildlife underpasses or overpasses), improvements to existing bridges and culverts, fencing needs or improvements (e.g., adding new or repairing existing wildlife exclusion fence, removing right-of-way fences where possible).

PRIORITIZATION OF HIGHWAY CROSSING ZONES

The stakeholder group developed a set of scoring criteria to distinguish priorities among the identified highway crossing zones. Prioritization criteria were grouped into three categories: wildlife; safety; and urgency/opportunity. The Tier 1 prioritization encompasses both wildlife and safety considerations – combined, these criteria define the need for wildlife-highway mitigation. The Tier 2 prioritization includes criteria that affect the likelihood of wildlife-highway mitigation, specifically, threat urgency, land security, mitigation feasibility and mitigation opportunity. The prioritization criteria and the scoring scale for each criterion is described in Table 1. The stakeholder group then scored these criteria for each of the identified linkage areas.

Table 1. Prioritization criteria and scoring.

Criterion Description	Source	Scoring Scale
TIER 1 PRIORTIZATION: MITIGATION NEED		
Wildlife Criteria		
<p>Connectivity Value to a Target Species Value of the linkage area to the population of the target species. Includes threat to the population from WVC mortality.</p>	CPW data; Stakeholder and expert workshops	1, 3, 5 or 7 , where: 1 = low value to target species 7 = very high value to target species
<p>Magnitude of Cross-Road Movement or Range Use Score reflects number of animals that use the linkage area relative to other movements by the target species in Eagle County.</p>	CPW, Forest Service, BLM data; Expert knowledge	1-5 where: 1 = low magnitude 5 = high magnitude
<p>Threatened or Endangered Species (T&E) Use of linkage area by federally or state threatened or endangered species</p>	CPW	0, 1 or 3 , where: 0 = T&E species absent 1 = marginal for T&E species 3 = T&E species present
Safety Criterion		
<p>Safety Hazard to Motorists Based on wildlife-vehicle collision data</p>	CDOT Traffic and Safety crash reports; reported carcass counts by CDOT Maintenance Patrols	1-5 , where: 1 = low WVC rates 5 = high WVC rates
TIER 2 PRIORITIZATION: LIKELIHOOD OF MITIGATION		
Urgency, Opportunity and Feasibility Criteria		
<p>Threat Urgency Threat to wildlife movement through the linkage (e.g., from residential, commercial or industrial development, traffic, recreation activity)</p>	Stakeholders	1-5 , where: 1 = low threat urgency 5 = high threat urgency (i.e., linkage may be lost if no action is taken)

Criterion Description	Source	Scoring Scale
TIER 2 PRIORITIZATION: LIKELIHOOD OF MITIGATION		
Urgency, Opportunity and Feasibility Criteria		
Land Security Presence of adjacent or nearby public lands or private conservation lands. This assumes that public lands will remain in public ownership. Other threats to wildlife movements on these lands should be captured by the Threat Urgency criterion.	Land ownership data. Protected lands include public lands and private conservation lands and conservation easements.	1-5 , where: 1 = no nearby protected lands 5 = protected lands on either side of highway and throughout linkage area
Mitigation Feasibility Feasibility of implementing wildlife-highway mitigation (e.g., crossing structures and fencing) based on terrain and landscape features or other engineering constraints.	Site visits, CDOT engineering staff	1-5 , where: 1 = low feasibility 5 = high feasibility
Mitigation Opportunity Opportunity to implement mitigation, based on funding potential, willing private landowners and other situational considerations	Stakeholders	1-5 , where: 1 = low opportunity 5 = high opportunity

The Safety Hazard criterion is based primarily on reported WVC accidents and carcass data, in addition to CPW or other local knowledge regarding high WVC areas that may not be reflected in the WVC databases. In scoring this criterion, it was noted that road segments with historically high WVC where wildlife exclusion fence has recently been installed were given a low Safety Hazard score due to the presence of the fencing. Road segments that have been fenced for some time and continue to experience WVC were given a higher Safety Hazard score. For linkages where I-70 and US 6 are considered jointly and I-70 is fenced, the Safety Hazard score reflects the likelihood of WVC on I-70 and US 6.

The Threat Urgency criterion gives a high score to linkages facing urgent threat and a low score to those facing little or no threat to wildlife movement

to reflect that highly threatened linkages may be lost without intervention or mitigation. Threats to wildlife movement due to recreation on public lands were addressed in Threat Urgency rather than under the Land Security criterion because the lands remain under public ownership and it's possible that the threat could be reduced by coordinating with land managers. For linkages on I-70 with existing wildlife exclusion fencing, the fencing itself was considered a threat to connectivity if there are no functional crossing structures that allow wildlife passage across the interstate.

While there are three Wildlife criteria, there is only one Safety criterion in the matrix, and four implementation criteria. For a given linkage, each criterion captures a distinct attribute and was scored independently. However, the stakeholder group recognized that simply adding all of the criteria scores to determine an overall score gave more weight to the categories with more criteria (Wildlife and Implementation) and less to the category with only one criterion (Safety). As this weighting scheme did not reflect project objectives, the category scores were normalized so that that in the Tier 1 Prioritization, the combined score of the three wildlife criteria were weighted twice that of the sole safety criterion. This weighting reflects the project's emphasis on the need for connectivity for wildlife, while continuing to recognize that motorist safety is an important community value and driver for funding wildlife-highway mitigation. Meanwhile, the Tier 2 Prioritization evaluates the likelihood of mitigation being implemented in a given linkage area. While these are important considerations for any mitigation project, the primary driver should be based on mitigation need (Tier 1). Therefore, these are considered secondary criteria that may influence, for example, where to direct implementation efforts first given similar need. In the Tier 2 prioritization, the combined score of the four urgency/opportunity criteria is equivalent to the wildlife score weight.

The linkage prioritization process was an important step for multiple reasons:

- During the linkage identification process, the group identified almost every segment of these highways and county roads as having value for

wildlife movement; ultimately, choices had to be made about where to begin focusing conservation and mitigation efforts.

- The prioritization matrix provides a transparent framework demonstrating how priorities are defined.
- The prioritization matrix is dynamic and can be easily updated as circumstances shift, or as new opportunities arise.
- This prioritization provides guidance for land use, land management and mitigation planning, and provides a framework for relating these priorities to other priorities, such as those identified in community master plans, USFS and BLM plans, and CDOT's lynx in-lieu fee mitigation fund.

The resulting prioritization provides guidance for strategically implementing the recommendations provided in this plan and highlights specific areas where investments in mitigation and other conservation actions are expected to provide the greatest returns for wildlife movement, reduce WVCs, and offer the greatest feasibility for implementing mitigation recommendations under current conditions.

STAKEHOLDER SITE VISITS: REVIEW OF MITIGATION AND CONSERVATION RECOMMENDATIONS

Site visits were conducted with stakeholders July and August of 2018 to evaluate mitigation strategies, challenges and opportunities in the highest priority wildlife-highway linkages. Wildlife-highway mitigation may include new crossing structures (wildlife underpasses or overpasses), enhancements to existing bridges or culverts, wildlife exclusion fencing or wildlife-friendly fencing, traffic calming, or other measures designed to enhance connectivity for wildlife across roads and reduce WVC. Conservation recommendations may include land protection measures, such as conservation easements; zoning or permitting to ensure more compatible land use or to preserve wildlife movement corridors;

During these site visits, stakeholders provided additional input on the preliminary highway mitigation recommendations developed by the consultant team. Specifically, the stakeholder group provided input on the

engineering feasibility of constructing a wildlife crossing structure at specific locations; identifying additional land use challenges or management needs with regards to the proposed crossing structure locations; and highlighting the highest priority locations for wildlife-highway mitigation within a linkage area. Wildlife exclusion fencing is a critical component of highway-wildlife mitigation projects. The alignment and extent of wildlife exclusion fencing must be included as wildlife crossing projects are planned and designed, although it is not explicitly discussed in these recommendations, except where alterations to existing fencing is recommended.

PRIORITIZATION RESULTS

The resulting prioritization matrix provides transparency into the linkage prioritization process and a simple framework for revisiting and adjusting prioritization scores in the future as the landscape changes, new areas become threatened or new opportunities emerge. In addition to the overall matrix and total scores for each linkage (Table 2), these results may be broken down into their primary components for a better understanding of the criteria driving the overall prioritization scores and the need for wildlife-highway mitigation (Table 3).

Table 2. Prioritization of wildlife-highway linkages in Eagle County. See Table 1 for criteria descriptions and scoring.

Linkage Name	TIER 1 PRIORITIZATION BASED ON COMBINED WILDLIFE & SAFETY NEEDS						TIER 2 PRIORITIZATION BASED ON IMPLEMENTATION URGENCY, OPPORTUNITY & FEASIBILITY					TOTAL SCORE
	Wildlife/Biological				Safety		Urgency and Opportunity				Tier 2 Score*	
	Value to Target Species	Magnitude of Movement	T&E Species	Wildlife Score*	Safety Score*	Tier 1 Score*	Threat Urgency	Land Security	Feasibility	Oppor-tunity		
SH 131, Wolcott to State Bridge	7	5	1	8.7	5	13.7	5	2	3	4	7	20.7
I-70, West Vail Pass	7	4	3	9.3	3	12.3	4	5	2	4	7.5	19.8
I-70, Horn Ranch	6	4	1	7.3	4	11.3	3	5	4	4	8	19.3
I-70, Mud Springs	7	5	3	10	3	13	3	2	4	3	6	19
I-70, Van Campen's	6	4	0	6.7	4	10.7	5	1	3	5	7	17.7
I-70, Cottonwood Creek	5	4	0	6	4	10	4	2	4	4	7	17
SH 82, Emma	4	4	0	5.3	4	9.3	4	3	4	4	7.5	16.8
US24, Camp Hale	7	3	3	8.7	1	9.7	4	4	2	3	6.5	16.2
US 6, Arrowhead to Squaw Creek	3	4	0	4.7	5	9.7	5	2	2	2	5.5	15.2
I-70, Wilmore Lake	5	3	0	5.3	3	8.3	5	1	4	3	6.5	14.8
I-70, Red Sandstone	4	4	0	5.3	3	8.3	5	1	3	4	6.5	14.8
US 24, Dowd Junction to Red Cliff	5	3	1	6	3	9	4	2	2	2	5	14
I-70, Wolcott	5	3	3	7.3	1	8.3	5	1	4	1	5.5	13.8

**Scores have been normalized such that the combined Wildlife score is weighted twice the Safety score and the combined Urgency/Opportunity score is equal to the weight of the Wildlife score.*

Table 2. (continued)

Linkage Name	TIER 1 PRIORITIZATION BASED ON WILDLIFE & SAFETY NEEDS						TIER 2 PRIORITIZATION BASED ON IMPLEMENTATION URGENCY, OPPORTUNITY & FEASIBILITY					TOTAL SCORE
	Wildlife/Biological			Safety	Tier 1 Score*	Urgency and Opportunity Criteria				Tier 2 Score*		
	Value to Target Species	Magnitude of Movement	T&E Species	Wildlife Score*		Safety Score*	Threat Urgency	Land Security	Feasibility		Oppor-tunity	
Gypsum Creek Road, Cottonwood Pass Rd to L.E.D.E. Res.	5	5	0	6.7	1	7.7	3	3	4	1	5.5	13.2
I-70, East Vail	3	2	0	3.3	3	6.3	5	1	3	4	6.5	12.8
Colorado River Road, Red Dirt	5	4	0	6	1	7	1	5	4	1	5.5	12.5
Brush Creek Road, Hardscrabble	6	3	0	6	1	7	2	4	1	3	5	12
Colorado River Road, Sweetwater	4	3	1	5.3	1	6.3	1	4	4	1	5	11.3
I-70, Strawberry Fields	3	2	0	3.3	3	6.3	4	2	1	2	4.5	10.8
SH 131, Antelope Road	4	3	0	4.7	1	5.7	3	2	3	2	5	10.7
I-70, Eagle-Vail	4	2	0	4	1	5	5	1	2	2	5	10
Brush Creek Road, Frost Creek	3	3	0	4	1	5	3	3	2	2	5	10
Cottonwood Pass Road	3	2	1	4	1	5	1	4	4	1	5	10
I-70, West Avon	3	1	0	2.7	1	3.7	5	2	3	2	6	9.7
Colorado River Road, Catamount	2	2	0	2.7	1	3.7	2	3	3	1	4.5	8.2

**Scores have been normalized such that the combined Wildlife score is weighted twice the Safety score and the combined Urgency/Opportunity score is equal to the weight of the Wildlife score.*

Table 3. Comparison of top ranked linkages based on Wildlife criteria, Safety criteria, and the combined Tier 1 Prioritization (both wildlife and safety criteria).

Top Linkages based on Wildlife Scores		Top Linkages based on Safety Scores		Top Linkages based on combined Tier 1 Prioritization	
1	I-70, Mud Springs	1	SH 131, Wolcott to State Bridge	1	SH 131, Wolcott to State Bridge
2	I-70, West Vail Pass	1	US 6, Arrowhead to Squaw Creek	2	I-70, Mud Springs
3	SH 131, Wolcott to State Bridge	3	I-70, Horn Ranch	3	I-70, West Vail Pass
3	US 24, Camp Hale	3	I-70, Van Campen's	4	I-70, Horn Ranch
5	I-70, Horn Ranch	3	I-70, Cottonwood Creek	5	I-70, Van Campen's
5	I-70, Wolcott	3	SH 82, Emma		

WILDLIFE LINKAGES AND MITIGATION RECOMMENDATIONS

Twenty-five wildlife linkage areas were identified across CDOT highways and major county roads in Eagle County. Each linkage area is described in the following sections with specific recommendations for highway mitigation and other conservation actions for improving opportunities for wildlife to move safely across a highway and through the linkage area. Linkage areas are presented by roadway in order of priority rank. Table 4 summarizes key wildlife-highway mitigation recommendations and conservation actions for the highest priority linkage areas, in order of overall priority rank across all roadways.

Wildlife linkage areas are presented by highway, in order of their priority rank. Prioritization scores and ranks are presented at the beginning of each linkage description. Highway mitigation recommendations must consider the needs of all target species that move or potentially move through a linkage area. For longer linkage areas, multiple crossing structures are needed to accommodate wildlife movements. Redundancy is important to accommodate different types of wildlife and to provide multiple crossing opportunities across a longer road segment.

Preliminary recommendations for structure locations and types are provided. More precise structure dimensions will need to be determined in conjunction with CDOT engineers as transportation projects are designed. Wildlife exclusion fencing is always recommended in conjunction with wildlife crossing structures to guide animals to a structure. Further assessment will be required during project development and design to refine these preliminary recommendations to determine the exact location, structure design, extent of wildlife exclusion fencing, and other complementary mitigation measures, such as escape ramps, wildlife guards at driveways and intersections, warning signage at fence ends, and other strategies.

Table 4. Summary of key wildlife-highway mitigation recommendation and conservation actions to restore and improve connectivity for wildlife in the highest priority linkage areas in Eagle County. See text for detailed recommendations. The estimated relative cost of each recommendation is included in parenthesis [\$ – \$\$\$\$].

Priority Rank	Linkage Name	Mileposts	Wildlife Need	Safety Need	Key Mitigation Strategies
1	SH 131, Wolcott to State Bridge	1-14	High	Very High	<ul style="list-style-type: none"> Remove right-of-way fence or, where necessary, replace with wildlife friendly alternative [\$\$] Construct multiple wildlife crossing structures and install wildlife exclusion fencing [\$\$\$\$] Work with major private landowners to preserve wildlife movements across private lands [\$\$\$]
2	I-70, West Vail Pass	182.5 – 190	Very High	Medium	<ul style="list-style-type: none"> Construct wildlife crossings for large fauna and install wildlife-exclusion fence between MP 187 – 190 [\$\$\$\$] Coordinate with CPW and the Forest Service to manage human activity, e.g., recreation, hunting [\$\$] Coordinate with the West Vail Pass Auxiliary Lanes Project [\$]
3	I-70, Horn Ranch	153 – 154.5	High	High	<ul style="list-style-type: none"> Repair wildlife exclusion fence [\$] Close all one-way gates and replace with escape ramps [\$\$] Remove barbed wire fencing; replace with wildlife-friendly fence where needed [\$\$] Pursue land conservation and/or measures (e.g., zoning) to limit development east of MP 154 [\$\$\$] Construct a wildlife crossing structure [\$\$\$\$]
4	I-70, Mud Springs	169.5 – 173	Very High	Medium	<ul style="list-style-type: none"> Extend and improve the wildlife exclusion fence alignment to prevent animal incursions into the fenced right-of-way [\$\$] Replace the Mud Springs box culvert with a span bridge or large culvert; investigate additional crossing structure opportunities, e.g., MP 170.5 [\$\$\$\$] Improve the Whiskey Creek box culvert and bridges over Gore Creek and the Eagle River for wildlife movement [\$\$] Pursue land conservation to limit development [\$\$\$\$]
5	I-70, Van Campen’s	148 – 152	Medium	High	<ul style="list-style-type: none"> Remove barbed wire fencing; replace with wildlife-friendly fence where needed [\$\$] Close all one-way gates and replace with escape ramps [\$\$] Replace the box culvert at MP 149.8 with a wide bridge underpass suitable for elk and other wildlife passage [\$\$\$\$] Improve and maintain functionality of existing structures [\$]

Table 4 (continued)

Priority Rank	Linkage Name	Mileposts	Wildlife Need	Safety Need	Key Mitigation Strategies
6	I-70, Cottonwood Creek	143 – 144	Medium	High	<ul style="list-style-type: none"> Coordinate with land owners and land managers to ensure compatible land use under and adjacent to the existing I-70 bridges to maintain or improve the functionality for wildlife passage, e.g., MP 143.1 and 143.8 [\$] Improve the fence ends at the Eagle interchange to minimize wildlife incursions into the fenced right-of-way; survey the fence for other gaps and make repairs [\$\$] Pursue land conservation along the Eagle River between I-70 and US 6 to preserve open spaces and east-west wildlife movements along the riparian corridor [\$\$\$\$] Install seasonal, targeted warning signage on US 6 [\$\$]
7	SH 82, Emma	18 – 23	Medium	High	<ul style="list-style-type: none"> Replace box culvert at MP 22.1 with a low, wide underpass or construct a wildlife overpass at MP 22.2 [\$\$\$\$] Create pathways for wildlife under bridge at MP 21.1 [\$\$] Make wildlife exclusion fencing continuous and control all gaps at driveways and access roads with deer guards [\$\$\$] Close all one-way gates and replace with escape ramps [\$\$] Consider implementing traffic calming measures on Two Rivers Road [\$\$-\$\$\$]
8	US 24, Camp Hale	153.5 – 166	High	Low	<ul style="list-style-type: none"> Given current connectivity and low WVC, develop a long-term vision for future needs for highway mitigation [€] Coordinate with the Forest Service to determine sustainable recreation management guidelines [€] Coordinate with Eagle River restoration to tie habitat improvements to recreation restrictions at Camp Hale [€]
9	US 6, Arrowhead to Squaw Creek	163.5 - 169	Low	High	<ul style="list-style-type: none"> Improve functionality of existing structures for wildlife, e.g., Lake Creek bridge MP 165.1 [€€] Limit development along the Eagle River [\$\$\$\$] Remove barbed wire fencing on open space lands along the Eagle River corridor [€] Create pathways through the rocky riparian banks along the Eagle River [€€] Implement traffic calming along select segments [€€-\$\$\$] Investigate opportunities to construct new wildlife crossing structures across US 6 [€]

Table 4 (continued)

Priority Rank	Linkage Name	Mileposts	Wildlife Need	Safety Need	Key Mitigation Strategies
10	I-70, Wilmore Lake	157.5 – 163	Medium	Medium	<ul style="list-style-type: none"> • Improve the fence ends at the Edwards interchange to minimize wildlife incursions into the fenced right-of-way [\$\$] • Pursue land conservation to limit development on undeveloped lands to maintain east-west movements on either side of I-70 [\$\$\$\$] • Improve wildlife fencing and maintain functionality of the bridge over US 6 (MP 158.8) for wildlife movement [\$\$]
11	I-70 Red Sandstone	174 – 177	Medium	Medium	<ul style="list-style-type: none"> • Town of Vail: Consider requiring wildlife mitigation as a part of a development requirement [\$] • Consider introducing traffic calming measures on the frontage roads [\$-\$\$\$] • Replace the culvert at Red Sandstone Creek with a multi-use wildlife crossing [\$\$\$\$]
12	US 24, Dowd Junction to Red Cliff	143.4 – 152.5	High	Medium	<ul style="list-style-type: none"> • Given current connectivity and low WVC, develop a long-term vision, including future needs for highway mitigation and land use management [€] • Identify the best locations for wildlife crossing structures and wildlife exclusion fence south of Minturn [€]
13	I-70, Wolcott	155.5 – 157.5	High	Low	<ul style="list-style-type: none"> • Tighten fence ends at the Wolcott/SH 131 interchange [€€] • Remove debris from the culvert at MP 157.1 [€] • Require new development permits to maintain wildlife corridors [€] • Construct a wildlife overpass at MP 157.5 [\$\$\$\$]

INTERSTATE 70

Interstate 70 (I-70) is an east-west highway that runs the length of Eagle County, serving as both the geographic and socio-economic center of the county, with most development, including all of the county's major towns, concentrated in the valleys and hillsides adjacent to the highway corridor. US Highway 6 parallels I-70 through much of the county, acting as a frontage road or local alternative to the interstate. The Union Pacific Railroad also parallels the highway corridor from Minturn to Glenwood Canyon. Development in Eagle County is concentrated in the valleys around the highway corridor.

The interstate parallels riparian drainages along its length: Black Gore Creek, a headwater stream, descends from Vail Pass at the eastern end of the county into Gore Creek, the Eagle River and ultimately the Colorado River at Dotsero. To an extent, wildlife in this area has adapted to the barrier of the interstate and associated infrastructure; however, animals still require connections across the interstate to accommodate seasonal, migratory and dispersal movements to maintain their populations.

CPW notes that elk and mule deer populations have been in decline in Eagle County since 2007. Much of the area between Eagle-Vail to Wolcott is mapped as winter range and severe winter range for elk. In addition, the north side of the interstate is mapped as deer winter range and is a major migration corridor between down valley winter habitat and the mountainous summer habitat around Vail Pass. The area around Wolcott also provides more concentrated winter range and severe winter range habitat for deer. West of Dotsero, wildlife activity is limited; however, future development around Dotsero could result in more animals moving west.

Since the 1994, wildlife exclusion fencing has been erected along I-70 in segments. Along some sections, wildlife fencing was originally erected only on one side of the interstate; however, as of 2017, the entire highway corridor from West Vail (MP 171.5) to Glenwood

Canyon (MP 131.5) just east of the Garfield County line, has wildlife fencing on both sides of the interstate.

For most of the I-70 linkages identified herein, I-70 and US 6 were considered jointly, with the exception of one segment of US 6 between Arrowhead and Squaw Creek (MP 163.5-169.0), where the Eagle River runs between I-70 and US 6, and wildlife must cross US 6 to access a water source.

1. I-70, West Vail Pass

Mileposts: 182.5 - 190

Objectives: Reduce WVC and improve permeability for dispersing lynx and summering elk, mule deer, moose and forest carnivores.

Land Ownership: Private, National Forest

Road Type: Four-lane interstate

Wildlife Score (Max = 10)	Safety Score* (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
9.3	3	12.3 [Rank 3/16]	7.5	19.8 [Rank 2/22]

**Score based primarily on available WVC crash and carcass datasets and CPW/USFWS data on Canada lynx mortalities.*

Primary Target Species	Movement Type	Population Value to Species	WVC Rate
Canada Lynx	Within home range, dispersal movements	High	High
Elk	Summer range	Moderate	Low
Mule Deer	Summer range	Moderate	Low
Secondary Target Species			
Moose		Moderate	Low

The West Vail Pass linkage area encompasses the entire west side of the pass from the Gore Creek drainage to the rest area exit at the summit of the pass. The linkage area is almost entirely natural forested habitat on either side of the interstate; however, this area also experiences high levels of recreation activity year-round. The linkage area connects high elevation elk and mule deer summer range and is important for the movement of lynx and other forest carnivores. This segment was identified as having a very high probability of lynx highway crossing in an empirical-based study conducted by Baigas et al (2017). Two lynx WVC mortalities have been documented in this linkage area – at MP 187.4 and MP 188.7. A breeding population of lynx is also known to inhabit the east side of Vail Pass. Lynx activity

may be displaced by the high levels of motorized and non-motorized winter recreation that occurs in this area (Squires et al 2011). This segment was also identified as a primary habitat connection across I-70 for lynx, deer and elk in the Phase I wildlife connectivity assessment.

Five existing span bridges in this linkage area currently provide functional wildlife passages under I-70 in the lower reaches of the linkage area. These bridges are located roughly every half mile from MP 183 to MP 185.5. Wildlife regularly pass under these bridges despite the absence of wildlife exclusion fencing (Singer et al. 2011; SREP 2007). The high and wide design of the bridges across natural drainages and high traffic volumes (20,000 average annual daily traffic) likely deter many animals from attempting to cross at grade. A sixth bridge is present at MP 182.5 over Black Gore Creek; however, the drainage at this location is very steep and narrow and this structure does not accommodate terrestrial wildlife passage.

Above the bridge at MP 185.5, the interstate becomes a barrier to wildlife movement due to high traffic volumes and uneven lanes through steep terrain, including median barriers and retaining walls. Wildlife may cross I-70 near the top of the pass (~MP 189-190); however, this area has heavy human activity due to the rest area and trail access (Vail Pass is the primary entry point into the Vail Pass Winter Recreation Area). The upper portions of the pass (MP 187-189) are considered the most important for lynx movement.

WVC are moderately low in this linkage compared to other segments of I-70 in Eagle County; however, WVC represent a large proportion of the total accidents in this linkage. WVC are highest in the upper portions of the linkage area where there are no large span bridges under which wildlife may cross.

This linkage lies entirely within the White River National Forest. The Eagles Nest Wilderness is located along the northeast side of the linkage. The Vail Pass Winter Recreation Area is located at the summit

of Vail Pass and extends along the northwest side of I-70, over Shrine Pass and towards Vail Ski Resort and the Town of Minturn. A recreation path parallels the west side of I-70 throughout the linkage area. The path is not believed to present a barrier to wildlife movement, although it receives high levels of use during the summer season. However, a proposal to move the bike path to the south side of Black Gore Creek would be expected to result in further infringements on wildlife habitat and movements.

CDOT is currently conducting an alternatives analysis, environmental assessments and preliminary design for the West Vail Pass Auxiliary Lanes Project, which will increase the footprint of the interstate and the barrier effect of the interstate. West Vail Pass was first identified as high priority for wildlife-highway mitigation in 2004 by the ALIVE stakeholder group. The ALIVE MOU states that permeability for wildlife should be maintained or improved within the project limits, and mitigation is a high priority for the project's technical team. Consequently, the opportunity to mitigate in this linkage area is now high. If no mitigation is implemented for this project, CDOT will be required to pay a maximum of 5% of the project cost into the lynx-in-lieu-fee mitigation fund.

Preliminary Connectivity Recommendations and Opportunities

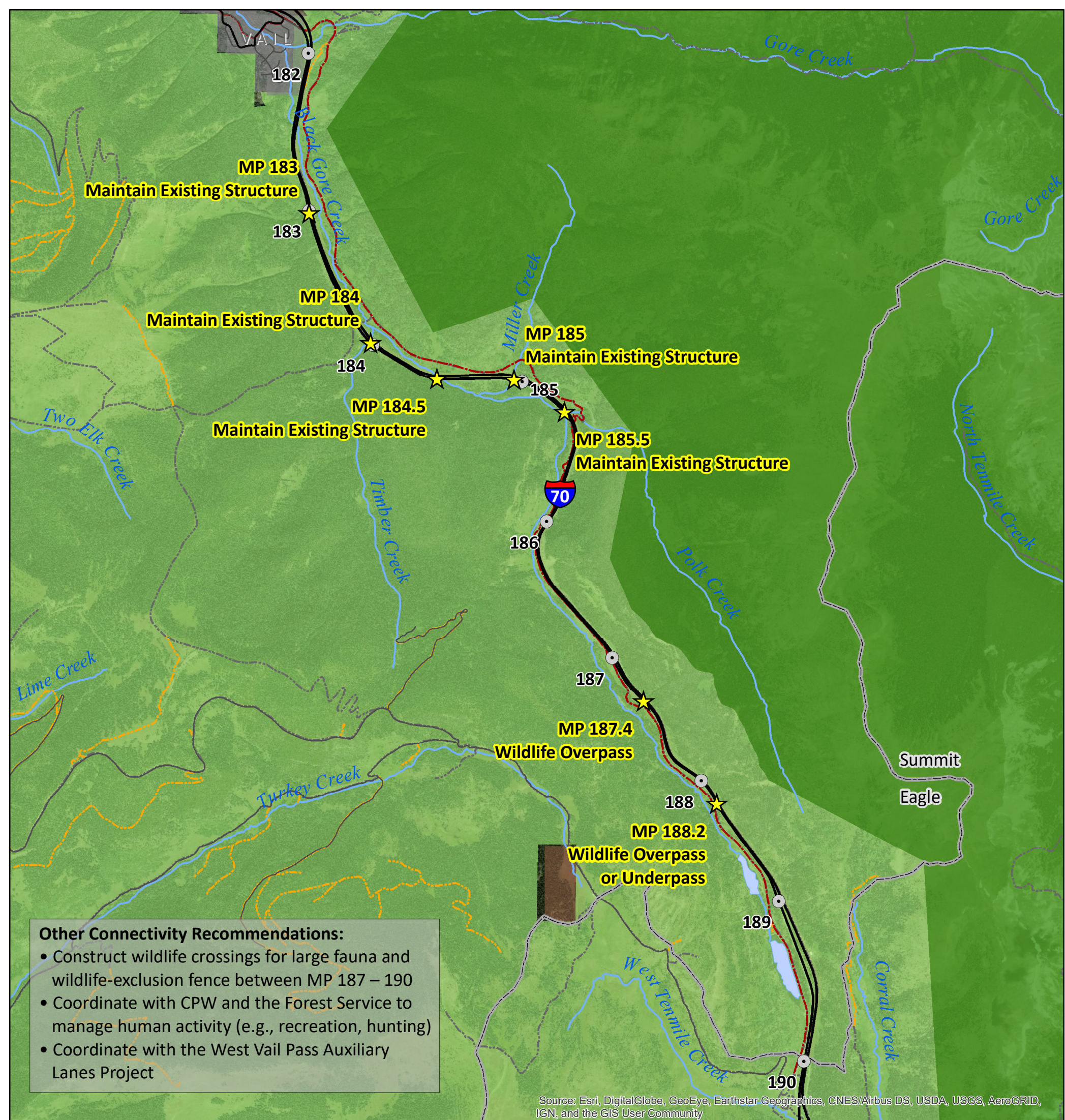
- Integrate wildlife mitigation into the West Vail Pass Climbing Lanes Project which kicked off in late Winter 2018. Investigate new opportunities to construct a wildlife crossing structure in the upper reaches of this linkage area (MP 187-190). Specifically,
 - MP 187.4 – the original location for a proposed wildlife overpass and the site of the ARC design competition. Surveys indicate geotechnical constraints at this location (and suggest similar constraints at other nearby locations).
 - MP 188.2 – either an overpass structure or an underpass could be constructed at this location, identified by CDOT.

An underpass at this location should be very wide to prevent the structure from producing a tunnel effect.

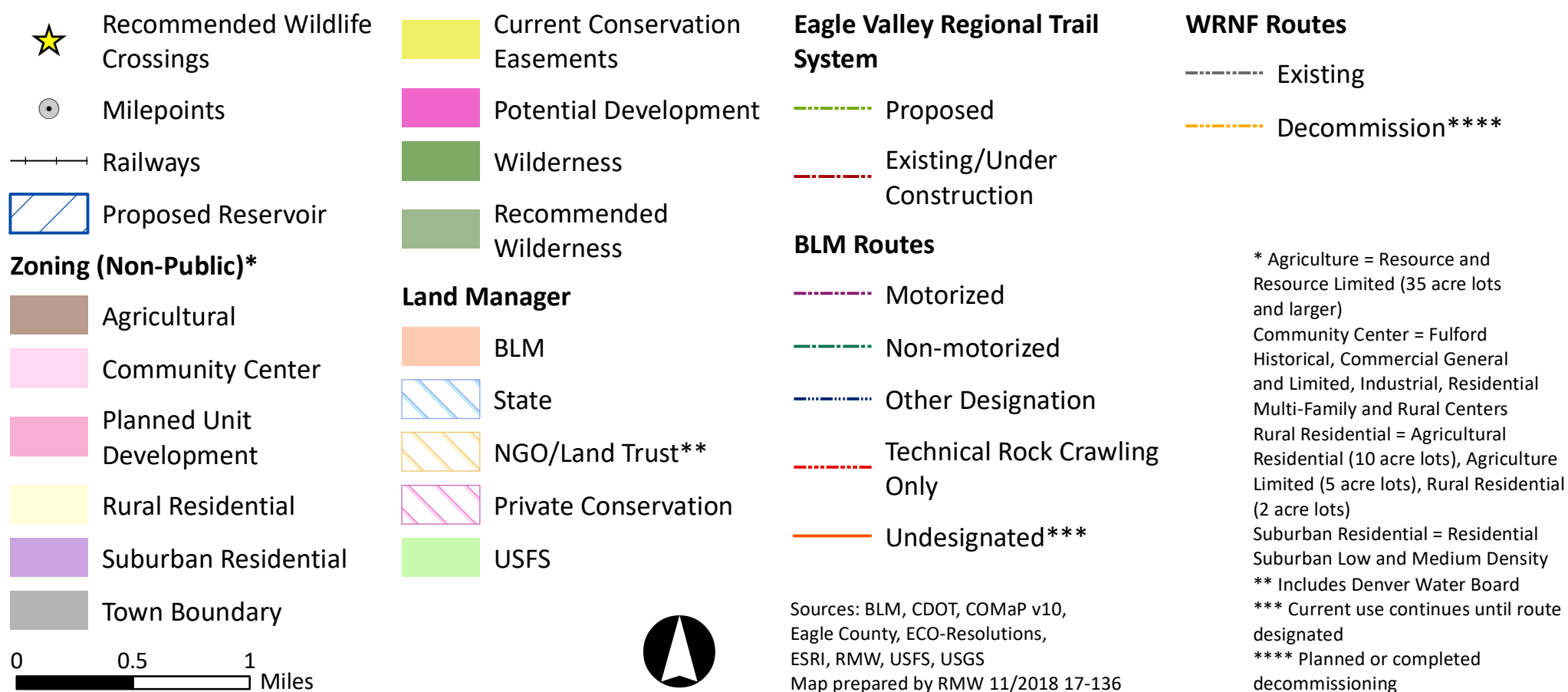
- An underpass structure may not be advised in this area due to heavy snow loads and snow plowing, which could result in the culvert entrances becoming blocked in the winter months. In addition, the stakeholder group noted that there may be greater community support and visibility for a wildlife overpass.
- Wildlife exclusion fence should be constructed with any new crossing structures. The fence alignment must account for the bike path and other human access points (e.g., by hunters) and should include gates or other measures in places.
- Coordinate with CPW and the Forest Service to manage human activity (e.g., recreation, hunting) in a manner that is compatible with wildlife activity, particularly where recreation trails pass under the existing bridges or where new wildlife crossing structures or wildlife exclusion fence is planned.



*Elk under divided span bridge at
MP 185.5*



I-70 West Vail Pass (MP 182.5-190)



2. I-70, Horn Ranch

Mileposts: 153-154.5

Objectives: Reduce WVC on US 6; Improve wildlife permeability across I-70 and US 6

Land Ownership: Eagle County (Horn Ranch), BLM

Road Type: Four-lane interstate

Wildlife Score (Max = 10)	Safety Score* (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
7.3	4	11.3 [Rank 4/16]	8	19.3 [Rank 3/22]

*Score based primarily on available WVC crash and carcass data from I-70 & US 6.

Primary Target Species	Movement Type	Population Value to Species	WVC Rate*
Canada Lynx	Dispersal	High	Low
Elk	Migration, daily along river corridor in winter range	High	High
Mule Deer	Migration, daily along river corridor in winter range	High	High
Secondary Target Species			
Pronghorn		Low	Low

*Includes WVC on I-70 and US 6.

Horn Ranch Open Space includes Eagle County Open Space south of I-70 and a private conservation easement, largely north of I-70. BLM lands lie beyond both to the north and south. This linkage is under conservation/public management with the exception of a private inholding along the Eagle River (~MP 153.5-153.9) and east of MP 154.1. Beyond the riparian corridor and the ranch boundaries, the terrain becomes steep and cliffy, to some degree constricting wildlife movements to the riparian corridor or along north-south side drainages.

The area north of I-70 is part of a larger east-west mule deer migration corridor, and the entire linkage is identified as winter range and a highway crossing zone for both deer and elk. However, given the

presence of wildlife fencing along this segment of I-70 since the 1970's, wildlife movements are largely constrained to either the north or south side of I-70. There are three existing structures under I-70 in this segment. A small span bridge with a dirt access road and concrete side slopes is located at MP 152.9. Monitoring conducted in 2010 (Singer et al 2011) detected mule deer tracks in the vicinity of the structure, but documented deer using the structure only on two occasions. Most activity was by vehicles or other human activity. A small concrete box culvert within the Horn Ranch Open Space is located at MP 153.3 and may have some functionality for passage by medium-sized and small fauna. A large, multi-span bridge spanning US 6, the railroad and the Eagle River is located at MP 154.0. A side drainage from the north drains into the Eagle River at this location. Monitoring during the summer and fall of 2010 detected primarily human activity, and some use of the structure by deer, elk, mountain lion and coyote. While human activity may restrict wildlife activity here, given the large area under the bridge, it is likely that only a portion of wildlife activity was captured by the monitoring camera.

Despite the presence of wildlife fencing, WVC continue to occur in this segment, as documented both by accident reports and carcass pickups (2007-2016). WVC also occur on US 6 at a moderately-high level relative to other segments of US 6 in Eagle County. With increasing development and traffic around Wolcott, the Horn Ranch linkage is becoming an even more critical landscape connection. A new, paved bike path is being constructed from Edwards to Eagle along the river corridor. The stakeholder group identified this linkage as being more significant for wildlife movement as well as having a higher likelihood of mitigation implementation than either the Van Campen's linkage immediately west or the Wolcott linkage to the east.

Preliminary Connectivity Recommendations and Opportunities

- Close all one-way gates in wildlife exclusion fence and replace with escape ramps, as needed.

- Remove barbed wire fencing along the railroad and bike path; replace with a wildlife-friendly alternative where needed.
- Investigate opportunities to construct new wildlife crossing structures, for example:
 - Install a wildlife overpass (e.g., double arch) around MP 152.8 where there is a grade separation between the opposing traffic lanes, a wide median and small cut slopes. A couple of small drainage from the north cuts through the cliffs to the Eagle River around this location; however more wildlife occurs east of this location (MP 153-154) where animals may descend from the plateau above the cliffs to an agricultural field on the north side of I-70 where they are known to congregate.
- Improve and maintain functionality of existing structures for wildlife. Specific recommendations include:
 - Repair holes in wildlife fence including places where the wildlife fence is too short or where there are gaps between a fence post and a structure abutment (e.g., gap on northwest side of the bridge underpass at MP 152.9).
 - Maintain the local access bridge (MP 152.9) for wildlife passage. The landowner already has a conservation easement on their property, and a cattle guard at this location has filled with sediment, allowing wildlife to cross over. Continue working with this landowner to replace any fencing or gates that may restrict wildlife passage with a wildlife-friendly alternative.
 - Maintain the concrete box culvert at MP 153.3 for carnivore and small fauna passage. Investigate opportunities to install a dedicated wildlife underpass in this area under I-70.
 - Maintain the multi-span bridge over US 6 and the Eagle River at MP 154.0 for wildlife passage. Human activity at

this location may limit some wildlife passage; however, no improvements to this structure are recommended. Cliffy terrain on the north side of I-70 may also restrict wildlife movement.

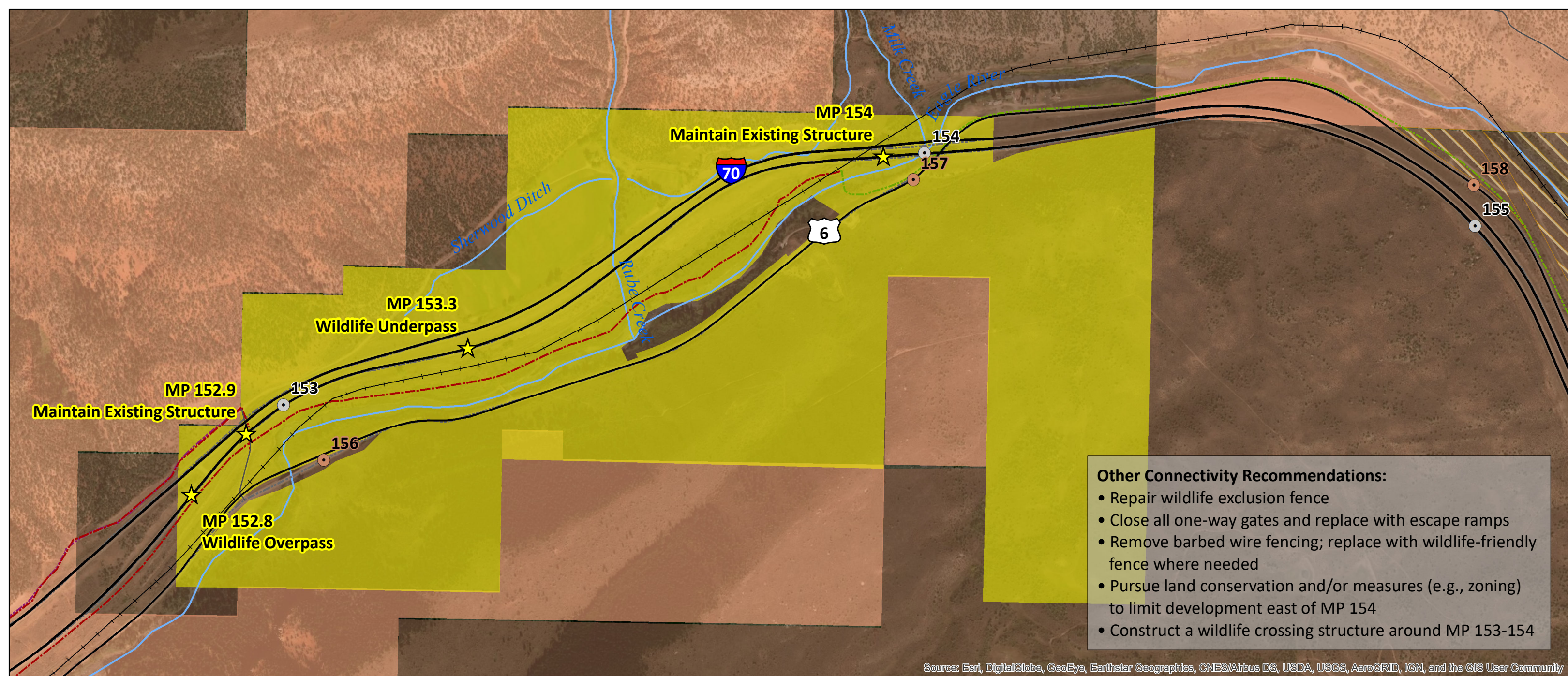
- Investigate additional wildlife mitigation strategies to reduce WVC along US 6.
- Pursue land conservation and/or measures (e.g., zoning) to limit development east of MP 154.



Bridge over access road at MP 152.9



Multi-span bridge over the Eagle River at MP 154.0



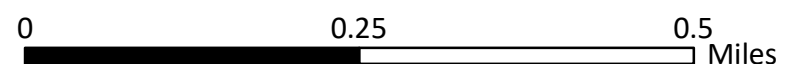
- Other Connectivity Recommendations:**
- Repair wildlife exclusion fence
 - Close all one-way gates and replace with escape ramps
 - Remove barbed wire fencing; replace with wildlife-friendly fence where needed
 - Pursue land conservation and/or measures (e.g., zoning) to limit development east of MP 154
 - Construct a wildlife crossing structure around MP 153-154

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

I-70 Horn Ranch (MP 153-154.5)

<p>★ Recommended Wildlife Crossings</p> <p>● Milepoints</p> <p>—+— Railways</p> <p>Current Conservation Easements</p> <p>Potential Development</p> <p>Proposed Reservoir</p>	<p>Zoning (Non-Public)*</p> <p>Agricultural</p> <p>Community Center</p> <p>Planned Unit Development</p> <p>Rural Residential</p> <p>Suburban Residential</p> <p>Town Boundary</p>	<p>Land Manager</p> <p>BLM</p> <p>State</p> <p>NGO/Land Trust**</p> <p>Private Conservation</p> <p>USFS</p>	<p>Wilderness</p> <p>Recommended Wilderness</p> <p>Eagle Valley Regional Trail System</p> <p>Proposed</p> <p>Existing/Under Construction</p>	<p>BLM Routes</p> <p>Motorized</p> <p>Non-motorized</p> <p>Other Designation</p> <p>Technical Rock Crawling Only</p> <p>Undesignated***</p>	<p>WRNF Routes</p> <p>Existing</p> <p>Decommission****</p>	<p>North Arrow</p>
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Sources: BLM, CDOT, COMaP v10, Eagle County, ECO-Resolutions, ESRI, RMW, USFS, USGS Map prepared by RMW 11/2018 17-136



* Agriculture = Resource and Resource Limited (35 acre lots and larger)
 Community Center = Fulford Historical, Commercial General and Limited, Industrial, Residential Multi-Family and Rural Centers
 Rural Residential = Agricultural Residential (10 acre lots), Agriculture Limited (5 acre lots), Rural Residential (2 acre lots)
 Suburban Residential = Residential Suburban Low and Medium Density
 ** Includes Denver Water Board
 *** Current use continues until route designated
 **** Planned or completed decommissioning

3. I-70, Mud Springs

Mileposts: 169.5-173

Objectives: Reduce WVC and improve permeability for migrating deer and elk, lynx and other carnivores

Land Ownership: National Forest, State Land Board (CPW lease), CPW, Private

Road Type: Four-lane interstate

Wildlife Score (Max = 10)	Safety Score* (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
10	3	13 [Rank 2/16]	6	19 [Rank 4/22]

*Score based on available WVC crash and carcass datasets and local knowledge.

Primary Target Species	Movement Type	Population Value to Species	WVC Rate
Canada Lynx	Dispersal	High	Low
Elk	Migration	Moderate	High*
Mule Deer	Migration	High	High*
Secondary Target Species			
Bighorn Sheep		Low	Low
Black Bear		Low	Low
Moose		Low	Low
Mountain Lion		Low	Low
Pronghorn		Low	Low

*WVC rates may decrease with the completion of wildlife exclusion fence through this segment.

The Mud Springs linkage is characterized by the joining of the Gore Creek drainage from the east and the Eagle River drainage from the south, and also marks the intersection of I-70 and US 24. The linkage supports a valley-wide mule deer migration corridor, which funnels through the Mud Springs box culvert (10'W x 10'H x 100'L) at MP 171.8, linking down valley winter range with the mountainous summer range around Vail Pass. Mud Springs itself is a narrow north-south drainage with cliffs on either side and is a recognized pinch point in this mule deer migration. A variety of other wildlife have also been

documented passing through this culvert, including black bear, mountain lion, elk and various small fauna (Singer et al. 2011). Pronghorn from the Middle Park herd are also increasingly observed around Meadow Mountain and moose are present around Dowds Junction. Most of this segment is identified as having a high probability of lynx crossing with the exception of the I-70/US 24 interchange, which has regular traffic flows and high levels of human activity (Baigas et al 2017).

Wildlife fencing was erected in the eastern portion of this linkage in the 1970's, at the same time the box culvert at Mud Springs was installed. Additional wildlife fencing was constructed through the remainder of the linkage area in 2017. Prior to the completion of the wildlife fence construction through this segment, WVC accidents reported to law enforcement and WVC carcass reports were highest around Dowd Junction. WVC continued to occur in this area in the spring of 2018 despite the new fence construction. At the eastern end of the linkage area, wildlife is known to cross at-grade where the wildlife fence ends at MP 173.

Other existing structures under I-70 include the Whiskey Creek box culvert (MP 170; 14'W x 14'H x 174'L); a bridge over US 24, the railroad and the Eagle River at Dowds Junction (MP 171.1); and a bridge over the bike path and Gore Creek at MP 171.3. The Whiskey Creek culvert is directly adjacent to US 6 on the north side, has a trailhead on the south side, and receives high levels of human activity. The Dowd Junction bridge also has high levels of human activity, including vehicular traffic on US 24 (west side of the river), as well as people and domestic animals (sheep, cattle, dog, horse) on the east side of the river. Limited activity by deer and elk was documented here (Singer et al 2011). CPW notes that elk movement at this location is infrequent, being most common during severe winters. The bridge over Gore Creek has very steep riprap banks that are unsuitable for terrestrial wildlife passage.

The Forest Service has implemented seasonal closures on trails in the Eagle Vail area and installed gates and begun public outreach efforts, including the use of volunteer trail ambassadors to educate the public about these closures. Winter closures exist on Forest Service lands for Whiskey Creek, the new Evercrisp trail and Eastern Hillside. Spring closures (calving) exist for Whiskey Creek, Stone Creek, Evercrisp and Eastern Hillside. No seasonal closures exist in the Meadow Mountain area, which receives high year-round recreation activity, and which has been largely abandoned by elk.

A recreation path runs parallel to the interstate through the linkage, along with a frontage road (US 6) and a railroad track from Minturn to Eagle-Vail. The railroad is currently inactive. A temporary screen is placed along the bike path in spring time to reduce recreation impacts on migratory wildlife using the Mud Springs box culvert. The bike path is closed in winter.

Since the onset of this connectivity study, several project partners have already initiated efforts to improve conditions in this linkage. In August 2018, CDOT and the Town of Vail met to discuss the high number of WVC that continue to occur in this linkage area. Following multiple conversations and a site visit, local partners including CDOT, CPW and the Town of Vail agreed to a short-term plan rehang the fence on a cable across Gore Creek through the winter season and to remove a gap in the fence between fence panel sections. The Town of Vail will also conduct public outreach and erect signs so that the fencing is not damaged by recreational users. To address long-term fencing needs, CDOT is developing a project to permanently realign the fence so that it does not cross over Gore Creek and to possibly extend the fencing to the West Vail interchange. This project may also include building escape ramps and potentially replacing the Mud Springs box culvert with a larger structure. In addition, the I-70/US 24 Dowd Junction Interchange project will likely be funded and may start construction in 2020.

The group is also reviewing a section of redundant wildlife exclusion fencing that extends east from the Mud Springs culvert along the north side of the highway. CDOT's wildlife exclusion fence runs along the north side of the highway (tying into the cliffs where appropriate). In addition, the original CPW fence runs parallel to the CDOT fence about half-way up the slope. The White River National Forest Eagle-Holy Cross Range has begun removing a section of the old CPW fence on USFS lands near West Vail. The group will continue to review fencing needs including the removal of additional redundant fencing once the long-term changes to the fence alignment are in place.



USFS removal of a section of redundant wildlife exclusion fence.

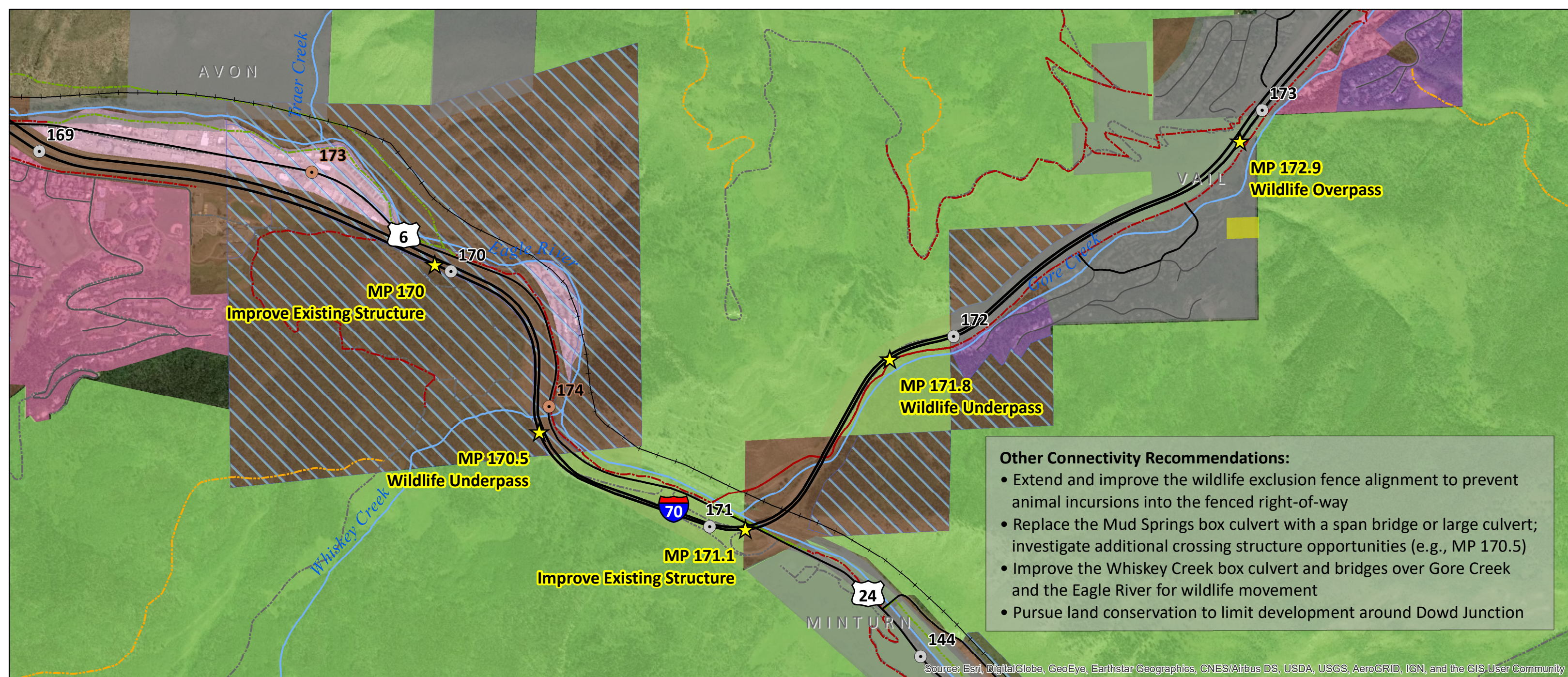
Preliminary Connectivity Recommendations and Opportunities

- Tighten wildlife exclusion fencing to prevent animal incursions into the fenced right-of-way. Specifically,
 - Improve the fence alignment at Mud Springs where it crosses over Gore Creek (see CPW fence designs).
 - Extend wildlife exclusion fence along the CDOT right-of-way to the West Vail Interchange. Remove wildlife fence that runs up the ridge on the north side of I-70 west of the West Vail interchange (Forest Service fence).
 - Bring fence down off the ridge towards the interstate on the southeast side of the Dowds Junction interchange.
- Investigate opportunities to construct new wildlife crossing structures, for example:

- Replace the Mud Springs box culvert (MP 171.8) with a wider span bridge to better accommodate elk passage and high numbers of migratory mule deer.
- Alternatively, construct a wildlife overpass around MP 172.9 near the west fence end, where there is Forest Service and Town of Vail land on either side of I-70. Extend wildlife fence to the West Vail interchange.
- Install a wildlife crossing structure for lynx and other carnivores at MP 170.5.
- Improve functionality of existing structures for wildlife. Specific recommendations include:
 - Whiskey Creek box culvert at MP 170 – multiple measures are needed at this location to improve wildlife functionality. Trailhead parking is now closed on the south side of I-70 and the new bike Evercrisp trail will displace mountain biker activity into the Eagle Vail neighborhood. However, continued trailhead access at Whiskey Creek will be important for hunter access to the State Land Board property. Habitat improvements at the south side culvert entrance and improving wildlife access at the north side culvert entrance, which is directly adjacent to US 6 are required to improve the functionality of this culvert for wildlife passage.
 - Implement enhancements under the bridge at Dowd Junction (MP 171.1) along the east side of the Eagle River to improve functionality for wildlife and reduce human and domestic animal activity on this side of the river. Should the project to replace the existing interchange with a new alignment move forward, wildlife movement needs should be integrated into the new design.
- Discuss with CDOT, the Town of Vail and other partners the potential to tunnel I-70 at Dowd Junction or to reconstruct the

Dowds Junction interchange to eliminate the curve, improve the interchange, and enhance wildlife connectivity at this location.

- Pursue land conservation and/or measures (e.g., zoning) to limit development around Dowd Junction.
- Coordinate with the State Land Board to permanently protect and prevent the sale or development of the Whiskey Creek parcel.



Other Connectivity Recommendations:

- Extend and improve the wildlife exclusion fence alignment to prevent animal incursions into the fenced right-of-way
- Replace the Mud Springs box culvert with a span bridge or large culvert; investigate additional crossing structure opportunities (e.g., MP 170.5)
- Improve the Whiskey Creek box culvert and bridges over Gore Creek and the Eagle River for wildlife movement
- Pursue land conservation to limit development around Dowd Junction

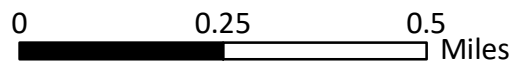
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

I-70 Mud Springs (MP 169.5-173)

<p>★ Recommended Wildlife Crossings</p> <p>● Milepoints</p> <p>—+— Railways</p> <p>■ Current Conservation Easements</p> <p>■ Potential Development</p> <p>▭ Proposed Reservoir</p>	<p>Zoning (Non-Public)*</p> <p>■ Agricultural</p> <p>■ Community Center</p> <p>■ Planned Unit Development</p> <p>■ Rural Residential</p> <p>■ Suburban Residential</p> <p>■ Town Boundary</p>	<p>Land Manager</p> <p>■ BLM</p> <p>▨ State</p> <p>▨ NGO/Land Trust**</p> <p>▨ Private Conservation</p> <p>■ USFS</p>	<p>■ Wilderness</p> <p>■ Recommended Wilderness</p> <p>Eagle Valley Regional Trail System</p> <p>▬ Proposed</p> <p>▬ Existing/Under Construction</p>	<p>BLM Routes</p> <p>▬ Motorized</p> <p>▬ Non-motorized</p> <p>▬ Other Designation</p> <p>▬ Technical Rock Crawling Only</p> <p>▬ Undesignated***</p>	<p>WRNF Routes</p> <p>▬ Existing</p> <p>▬ Decommission****</p> <p>▲ North Arrow</p>
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 Community Center = Fulford Historical, Commercial General and Limited, Industrial, Residential Multi-Family and Rural Centers
 Rural Residential = Agricultural Residential (10 acre lots), Agriculture Limited (5 acre lots), Rural Residential (2 acre lots)
 Suburban Residential = Residential Suburban Low and Medium Density
 ** Includes Denver Water Board
 *** Current use continues until route designated
 **** Planned or completed decommissioning

Sources: BLM, CDOT, COMaP v10, Eagle County, ECO-Resolutions, ESRI, RMW, USFS, USGS Map prepared by RMW 11/2018 17-136



4. I-70, Van Campen's

Mileposts: 148-152

Objectives: Reduce WVC on US 6; Improve wildlife permeability across I-70 and US 6

Land Ownership: Mostly private adjacent to I-70, BLM

Road Type: Four-lane interstate

Wildlife Score (Max = 10)	Safety Score* (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
6.7	4	10.7 [Rank 5/16]	7	17.7 [Rank 5/22]

*Score based primarily on available WVC crash and carcass data from I-70 & US 6.

Primary Target Species	Movement Type	Population Value to Species	WVC Rate*
Elk	Migration, daily along river corridor in winter range	High	Moderate
Mule Deer	Migration, daily along river corridor in winter range	High	Moderate
Secondary Target Species			
Pronghorn		Low	Low

*Includes WVC on I-70 and US 6.

The Van Campen's linkage area is located east of Eagle and is defined primarily by Van Campen's Ranch (now Red Mountain Properties). The landscape is characterized as rural agricultural and natural. The Eagle River wends its way through agricultural fields south of the interstate, the railroad (inactive) and US 6. These irrigated hay fields have served as an attractant and provided a resting area and forage for elk, particularly during severe winter conditions; however, these fields now lie fallow and are no longer irrigated, reducing their value to wintering elk.

This linkage supports a mule deer concentration area north of the Eagle River, indicating high quality habitat with year-round use by mule deer. CPW notes the presence of good winter range north of I-

70. In addition, the area north of I-70 is an east-west mule deer migration corridor, and the entire linkage is identified as winter range for deer and elk. Elk are known to congregate in the agricultural fields south of the interstate around MP 149 in the winter months. Milepost 151-153 was also identified as a primary habitat connection across I-70 for deer and elk in the Phase I wildlife connectivity assessment. However, wildlife fencing along I-70 through the linkage area prohibits north-south movements across the interstate.

The entire linkage is recognized by CPW as a highway crossing zone for deer. However, given the presence of wildlife fencing along this segment of I-70 since the 1970's, wildlife movements are largely constrained to either the north or south side of I-70. North-south movements are possible only at existing structure locations under I-70, including two concrete box culverts (MP 148.3 and MP 149.8), only one of which (MP 149.8) is large enough to support occasional movements by deer or elk. This culvert provides farm access and measures roughly 14'W x 14'H x 146'L. Camera monitoring conducted at this location by Singer et al. (2011) during 2009 and 2010 detected regular human activity (e.g., horse riders, ATVs, bikes, pedestrians and domestic dogs) and more limited wildlife activity, including mule deer, mountain lion, raccoon and, on four occasions, individual elk. A chain-link gate at the north structure entrance was periodically closed, cutting off wildlife access to the culvert. Cattle were also documented in the vicinity of the culvert. WVC rates (crash and carcass) on I-70 from 2007-2016 were low due to the presence of wildlife exclusion fencing but included one mountain lion near MP 148. WVC rates on US 6, are moderately-high relative to other segments of US 6 in Eagle County.

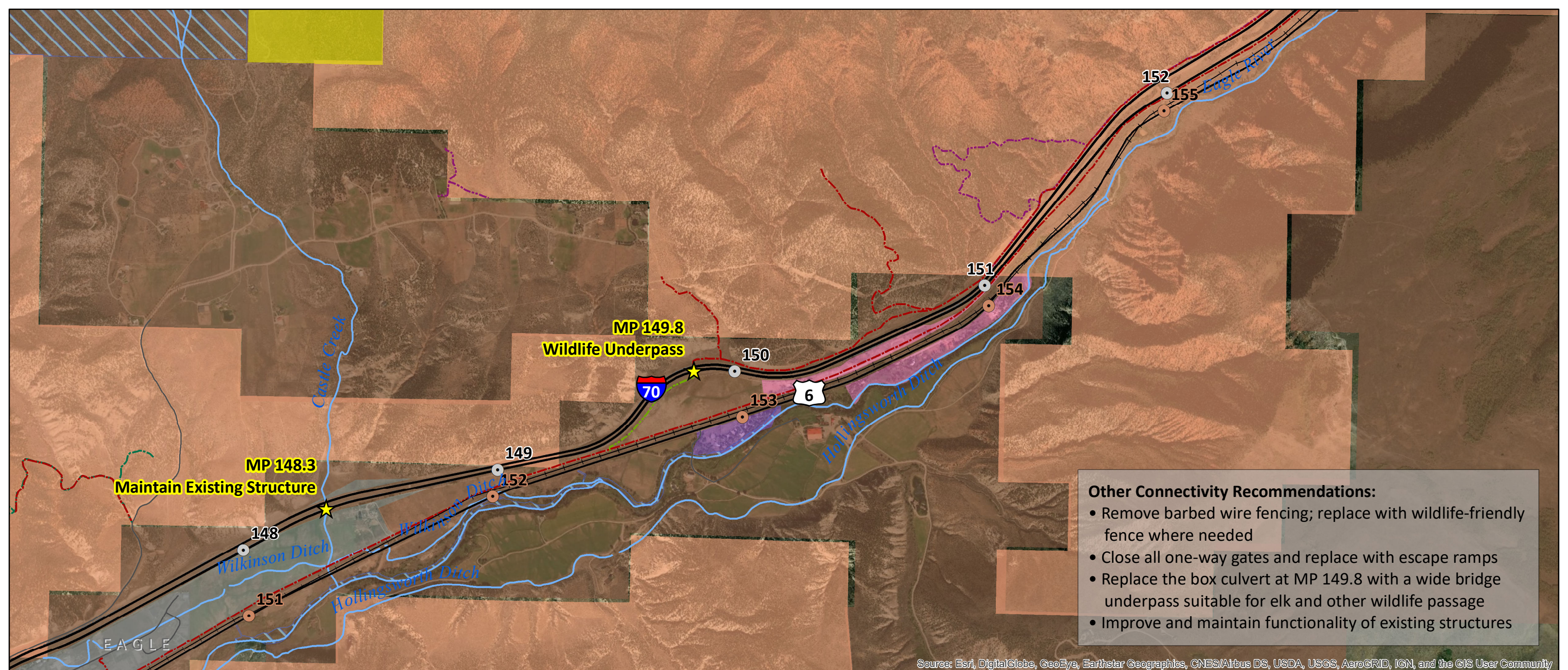
The primary threat to wildlife habitat and wildlife movement through this linkage area is the potential for future development, particularly along the river corridor and on agricultural lands south of I-70 in the eastern portions of the linkage. A new paved bike path is currently under construction from Edwards to Eagle.

Preliminary Connectivity Recommendations and Opportunities

- Close all one-way gates in wildlife exclusion fence and replace with escape ramps, as needed.
- Remove barbed wire fencing along the railroad and bike path; replace with a wildlife-friendly alternative where needed.
- Investigate opportunities to construct new wildlife crossing structures, for example:
 - Replace the box culvert at MP 149.8 with a wide bridge underpass suitable for elk and other wildlife passage.
- Improve and maintain functionality of existing structures for wildlife. Specific recommendations include:
 - Maintain the concrete box culvert at Castle Creek (MP 148.3) for carnivore and small fauna passage. Coordinate with the landowner to replace any fencing or gates that may restrict wildlife passage with a wildlife-friendly alternative, and to engage them in wildlife conservation efforts on their property.
 - Maintain the concrete box culvert at MP 149.8 for carnivore, small fauna and occasional ungulate passage. Coordinate with the landowner to remove any fencing or gates that may restrict wildlife passage, and to engage them in wildlife conservation efforts on their property.
- Implement rural/agricultural zoning, particularly on non-BLM lands north of I-70 and between MP 150.8-153.
- Pursue land conservation efforts relative to existing and potential wildlife crossing locations under I-70.



Horse riders at CBC, MP 149.8



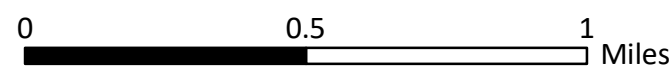
- Other Connectivity Recommendations:**
- Remove barbed wire fencing; replace with wildlife-friendly fence where needed
 - Close all one-way gates and replace with escape ramps
 - Replace the box culvert at MP 149.8 with a wide bridge underpass suitable for elk and other wildlife passage
 - Improve and maintain functionality of existing structures

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

I-70 Van Campen's (MP 148-152)

<p>★ Recommended Wildlife Crossings</p> <p>● Milepoints</p> <p>—+— Railways</p> <p>■ Current Conservation Easements</p> <p>■ Potential Development</p> <p>▭ Proposed Reservoir</p>	<p>Zoning (Non-Public)*</p> <p>■ Agricultural</p> <p>■ Community Center</p> <p>■ Planned Unit Development</p> <p>■ Rural Residential</p> <p>■ Suburban Residential</p> <p>■ Town Boundary</p>	<p>Land Manager</p> <p>■ BLM</p> <p>▨ State</p> <p>▨ NGO/Land Trust**</p> <p>▨ Private Conservation</p> <p>■ USFS</p>	<p>■ Wilderness</p> <p>■ Recommended Wilderness</p> <p>Eagle Valley Regional Trail System</p> <p>--- Proposed</p> <p>--- Existing/Under Construction</p>	<p>BLM Routes</p> <p>--- Motorized</p> <p>--- Non-motorized</p> <p>--- Other Designation</p> <p>--- Technical Rock Crawling Only</p> <p>--- Undesignated***</p>	<p>WRNF Routes</p> <p>--- Existing</p> <p>--- Decommission****</p>	<p>▲ North Arrow</p>
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Sources: BLM, CDOT, COMaP v10, Eagle County, ECO-Resolutions, ESRI, RMW, USFS, USGS Map prepared by RMW 11/2018 17-136



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 Suburban Residential = Residential Suburban Low and Medium Density
 ** Includes Denver Water Board
 *** Current use continues until route designated
 **** Planned or completed decommissioning

5. I-70, Cottonwood Creek

Mileposts: 143-144

Objectives: Reduce WVC on US 6 and prevent wildlife incursions into wildlife fence along I-70; Protect wildlife permeability across I-70 and US 6.

Land Ownership: Private, mostly BLM north of I-70

Road Type: Four-lane interstate

Wildlife Score (Max = 10)	Safety Score* (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
6	4	10 [Rank 6/16]	7	17 [Rank 6/22]

*Score based primarily on available WVC crash and carcass data from I-70 & US 6.

Primary Target Species	Movement Type	Population Value to Species	WVC Rate*
Elk	Migration, daily along river corridor in winter range	High	Moderately High on I-70 and US 6
Mule Deer	Migration, daily along river corridor in winter range	High	Moderate I-70; Very High On US 6
Secondary Target Species			
Pronghorn		Low	Low

*Includes WVC on I-70 and US 6.

This linkage area encompasses the 1-mile segment around Cottonwood Creek. There is continuous wildlife fencing and two existing bridges spanning ephemeral drainages at MP 143.1 and MP 143.8 that are sufficiently sized to provide functional passage for a variety of wildlife. The wildlife fence in this segment was constructed in 1979 and wildlife have largely adapted to its presence. The existing bridges under I-70 are important for wildlife movement as these are the only places where wildlife is able to cross I-70 due to the fencing. However, the functionality of these structures may be limited. Camera monitoring conducted by Singer et al (2011) detected only 4 mule

deer passing under the designate wildlife crossing at MP 143.1, likely due to the presence of domestic livestock, dogs and human activity, as well as a livestock fencing and a gate across the north structure entrance which was closed intermittently.

Mule deer are common on the slopes north of I-70 behind the City Market at the interchange. Since roundabouts were installed at this location, fewer deer have been observed at the interchange. Wildlife-vehicle collisions (WVC) are generally low through this segment due to long-term presence of wildlife fencing but have not been eliminated. Where WVC occur, they are likely the result of animals entering the fenced right-of-way through holes in the fence or at interchanges – the highest rate of WVC carcass pickups on I-70 is from MP 146 through MP 147, which encompasses the Eagle interchange. While the Eagle interchange is outside of this linkage area, improving the fence alignment and adding deer guards around the Eagle interchange and improving the functionality of the existing bridge structures for wildlife movement is expected to help alleviate this WVC problem. WVC also occur on US 6 – over the last 10 years, this segment of US 6 has had the highest number of WVC accidents and carcass reports compared to the rest of US 6 in Eagle County. WVC on US 6 spike between MP 146-147, which corresponds to MP 143-144 on I-70.

Ongoing development between Gypsum and Eagle including the conversion of agricultural lands to development is the greatest threat to wildlife activity and wildlife movement, both east-west along the riparian corridor and north-south across US 6 and, to the extent still possible, I-70. Several developments have already been approved in this area and the potential for additional build out continues. In addition, a new I-70 interchange is proposed near Cottonwood Creek (MP 144) to facilitate access to the Eagle County Regional Airport, although the likelihood of this proposal advancing is in doubt. A new bike path is also proposed between Eagle and Gypsum.

Preliminary Connectivity Recommendations and Opportunities:

- Because WVC continue to occur in this linkage, survey for gaps in the fence and repair where needed.
- Pursue land conservation along the Eagle River between I-70 and US 6 to preserve open spaces and east-west wildlife movements along the riparian corridor.
- Coordinate with land owners and land managers to ensure compatible land use under and adjacent to the existing bridges under I-70 to maintain or improve the functionality for wildlife passage. These structures are located at MP 143.1 and MP 143.9. A third bridge is located at MP 144.5, outside of the stakeholder defined wildlife-highway linkage area. This structure was also designated as a wildlife crossing structure when it was constructed but use by domestic livestock limits its functionality for wildlife. While outside of the defined linkage area, given the limited number of existing bridges or culverts under I-70 that may function for wildlife, efforts should be made to restrict livestock activity at the structure and to replace existing livestock fencing and gates beneath the structure with more wildlife-friendly alternatives that are set farther back from the structure entrances.
- Install targeted, seasonal warning signage on US 6.
- It is also recommended to tighten the wildlife exclusion fencing on the north side of the Eagle interchange. While this is outside of the linkage area, improvements to the fencing at this location will help prevent wildlife from entering the fenced right-of-way. Specifically:

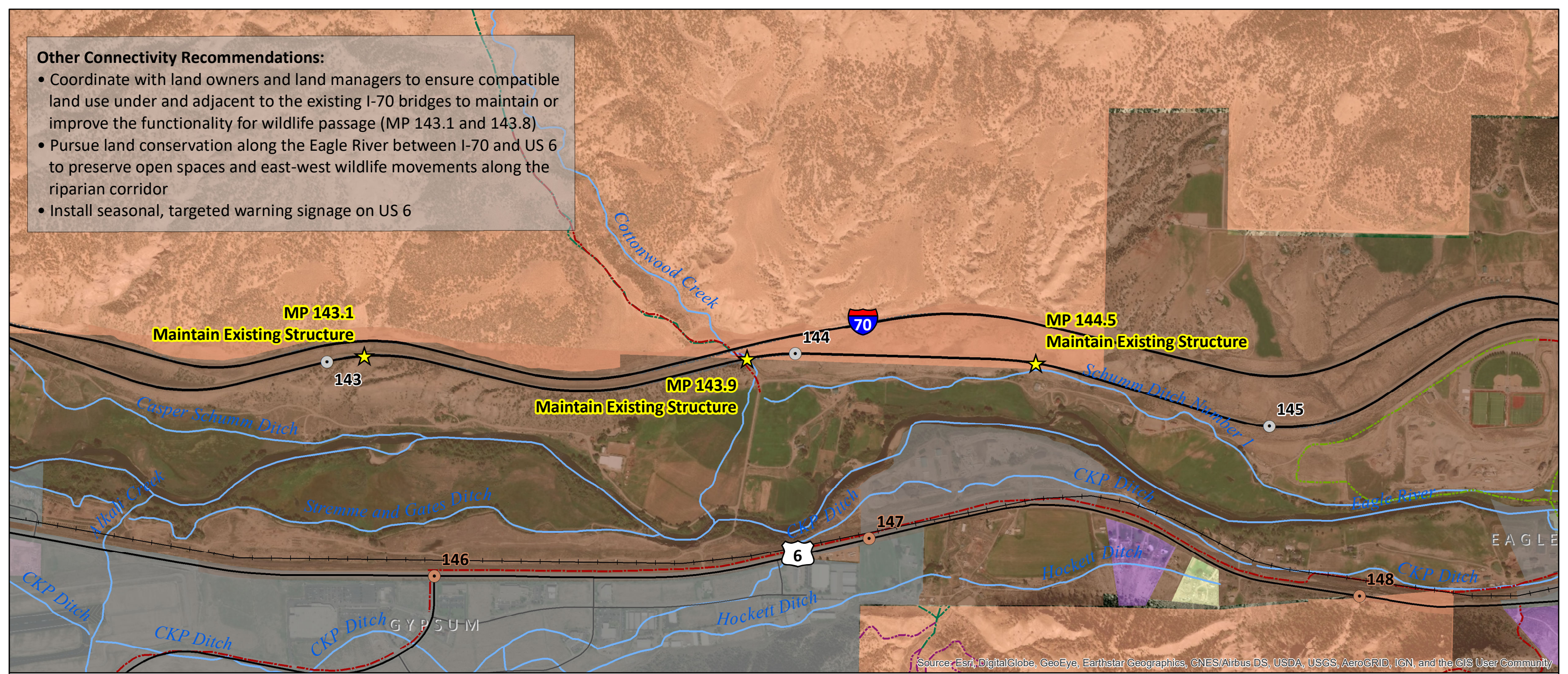


Double span bridge at MP 143.1

- Extend fencing at a 45° angle from the current fence end to overlap with the railings and abutments on either side of the pedestrian bridge.
- On the northeast side of the interchange, remove 2 segments of the existing fence and run new fence segments to the off-ramp and then from the ramp to the bridge abutment.
- On the northwest side of the interchange, extend fence to on-ramp and then from the ramp to the bridge abutment. The fence alignment at this location must account for pedestrian traffic to prevent the fence from being cut; specifically, truckers that are known to pull over at the top of the on-ramp and walk around the fence to Burger King. Riprap may be used to maintain a pedestrian pathway while preventing ungulate incursions into the fenced right-of-way.
- Add deer guards to prevent wildlife incursions into the fenced right-of-way or, at a minimum, add rumble strips to the on/off ramps to alert traffic in advance of the wildlife fence ends.

Other Connectivity Recommendations:

- Coordinate with land owners and land managers to ensure compatible land use under and adjacent to the existing I-70 bridges to maintain or improve the functionality for wildlife passage (MP 143.1 and 143.8)
- Pursue land conservation along the Eagle River between I-70 and US 6 to preserve open spaces and east-west wildlife movements along the riparian corridor
- Install seasonal, targeted warning signage on US 6

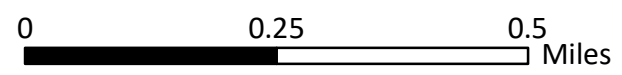


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

I-70 Cottonwood Creek (MP 143-144)

<p>★ Recommended Wildlife Crossings</p> <p>● Milepoints</p> <p>—+— Railways</p> <p>■ Current Conservation Easements</p> <p>■ Potential Development</p> <p>▭ Proposed Reservoir</p>	<p>Zoning (Non-Public)*</p> <p>■ Agricultural</p> <p>■ Community Center</p> <p>■ Planned Unit Development</p> <p>■ Rural Residential</p> <p>■ Suburban Residential</p> <p>■ Town Boundary</p>	<p>Land Manager</p> <p>■ BLM</p> <p>▨ State</p> <p>▨ NGO/Land Trust**</p> <p>▨ Private Conservation</p> <p>■ USFS</p>	<p>■ Wilderness</p> <p>■ Recommended Wilderness</p> <p>Eagle Valley Regional Trail System</p> <p>--- Proposed</p> <p>--- Existing/Under Construction</p>	<p>BLM Routes</p> <p>--- Motorized</p> <p>--- Non-motorized</p> <p>--- Other Designation</p> <p>--- Technical Rock Crawling Only</p> <p>--- Undesignated***</p>	<p>WRNF Routes</p> <p>--- Existing</p> <p>--- Decommission****</p>	<p>▲ North Arrow</p>
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 Suburban Residential = Residential Suburban Low and Medium Density
 ** Includes Denver Water Board
 *** Current use continues until route designated
 **** Planned or completed decommissioning



6. I-70, Wilmore Lake

Mileposts: 157.5-163

Objectives: Reduce WVC with deer, which continue to occur despite wildlife exclusion fence, and restore permeability primarily for wintering deer and elk.

Land Ownership: Private, BLM

Road Type: Four-lane interstate

Wildlife Score (Max = 10)	Safety Score* (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
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**Score based on available WVC crash and carcass datasets and CPW knowledge.*

Primary Target Species	Movement Type	Population Value to Species	WVC Rate
Elk	Winter range	Moderate	High*
Mule Deer	Migration, winter range	High	High*
Secondary Target Species			
Mountain Lion		Low	Low

**WVC rates may decrease with the completion of wildlife exclusion fence through this segment.*

The Wilmore Lake linkage area extends from Edwards to east of Wolcott. Much of the land in this linkage is private and includes several golf courses and substantial low-density development, with increasing density and commercial activity closer to Edwards. The western portion of this linkage area is largely an undeveloped, natural landscape from MP 158-160.5, with steep slopes on the north side of I-70. Note that the segment of US 6 through this area is considered independently and is not included in this linkage.

The slopes north of I-70 are part of a valley-wide mule deer migration corridor. Mule deer also migrate east-west up and down the Eagle River corridor along the south side of I-70. Much of this linkage area is also identified as winter range for deer and winter concentration areas or severe winter range for elk. The entire segment is a deer highway crossing zone and much of it is also identified as an elk highway

crossing zone by CPW. However, these cross-road movements are largely local in nature and not part of a migration route, including movements within winter range and by resident animals. This segment is also mapped as black bear and mountain lion human conflict areas. Wildlife exclusion fencing was erected in this segment in 2008 and completed in 2010, and wildlife are now prevented from making north-south movements across the interstate. Regardless, WVC continue to occur in this segment including 24 WVC accidents reported to law enforcement and 63 WVC carcass reports (primarily mule deer) since the completion of the wildlife fencing through 2016. This represents a two-thirds reduction in WVC in this segment compared to pre-fencing rates of WVC and, notably, a major decrease in WVC involving elk. These ongoing WVC incidents are likely due to wildlife entering the fenced right-of-way through gaps in the fence and becoming subsequently trapped, such as at the Edwards interchange or around Wilmore Lake where people have cut holes in the fence for fishing access or cars have crashed through the fence.

There are several existing structures under I-70 in this segment. A large bridge at MP 158.8 spans US6, the railroad and the Eagle River, and offers an opportunity for wildlife to safely cross under I-70. There is also a box culvert with a local access road at MP 159.4 and adjacent pipe culvert draining Red Canyon Creek, which was recently relined. Another road culvert at MP 164 provides access to the Cordillera development and golf course. These road culverts likely provide only limited passage under I-70 for generalist species such as coyote, fox and raccoon. A small, very long box culvert east of the Edwards interchange (MP 163.0) receives little, if any, wildlife use, although elk are known to bed down by the high school on the south side of I-70.

Preliminary Connectivity Recommendations and Opportunities

- Improve the fence ends at the Edwards interchange (MP 162.8) to prevent wildlife ingress into the fenced right-of-way.

Specifically,

- On the north side of I-70, extend the fence ends to the sidewalk around the traffic circle. Provide suitable pedestrian access through the wildlife fence as needed (e.g., riprap path through fence).

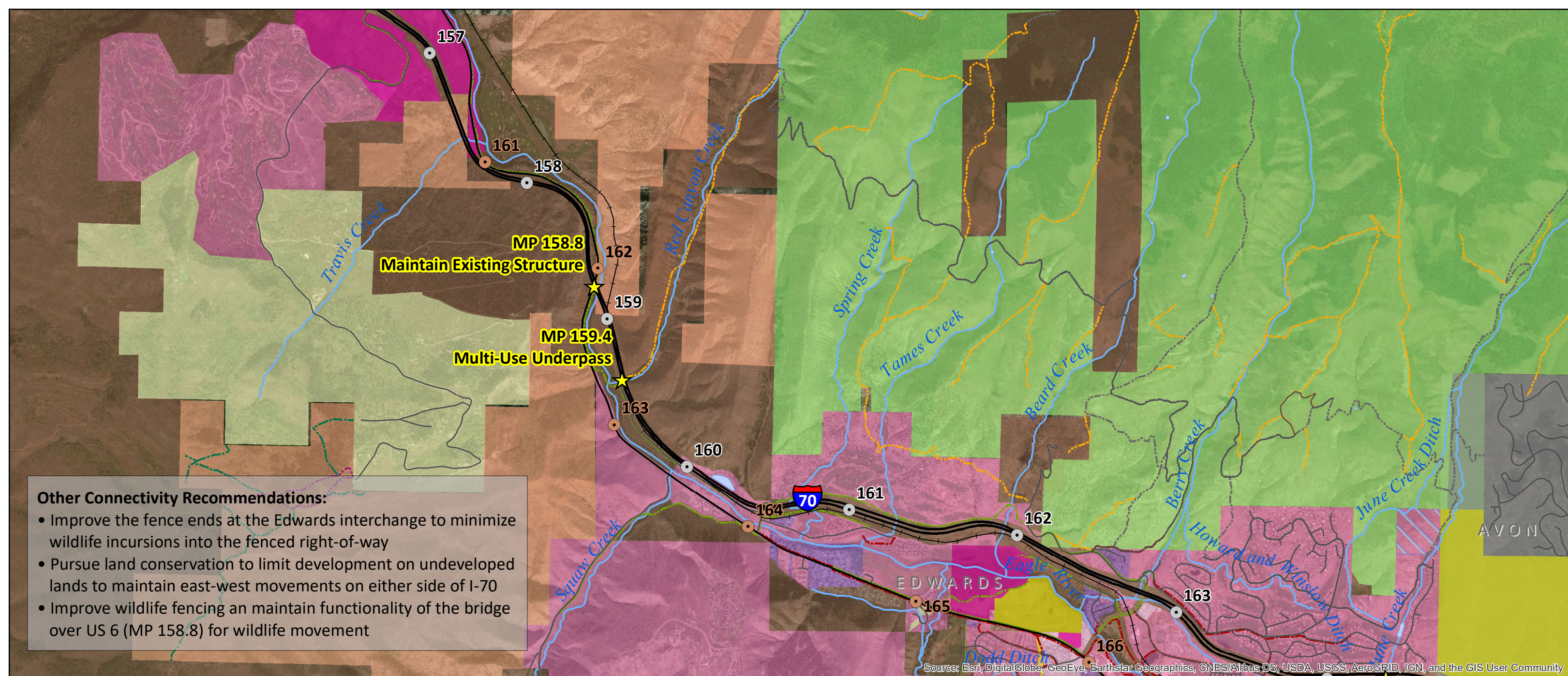


Fence end on the northeast side of I-70 at the Edwards

Add rumble strips to the westbound on/off-ramps to alert traffic near the wildlife fence ends. Could also consider running the fence behind the interchange development. This would reduce the number of access road gaps in the fence, but this alignment is outside of the CDOT right-of-way.

- Fence ends on the south side of I-70 are tight.
- Investigate how to provide suitable pedestrian access at Wilmore Lake so that people aren't compelled to cut holes in the fence.
- Maintain critical east-west migration movements on either side of I-70 and provide north-south crossing opportunities under I-70 to support current wildlife movements as well as potential shifts in wildlife movement in the future.
- Pursue land conservation and/or measures (e.g., zoning) to limit development on undeveloped lands in the linkage, particularly relative to potential wildlife crossing structures and west of MP 160.5.

- Investigate replacing the Red Canyon road and pipe culverts (MP 159.4) with a single multiuse bridge span (road, hydrology and wildlife) to reduce ongoing WVC (despite long-term fencing) and to preserve the potential for north-south wildlife movements under I-70 into the future.
- Maintain functionality of the bridge over US 6, the railroad and the Eagle River at MP 158.8 for wildlife passage.



Other Connectivity Recommendations:

- Improve the fence ends at the Edwards interchange to minimize wildlife incursions into the fenced right-of-way
- Pursue land conservation to limit development on undeveloped lands to maintain east-west movements on either side of I-70
- Improve wildlife fencing and maintain functionality of the bridge over US 6 (MP 158.8) for wildlife movement

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

I-70 Wilmore Lake (MP 157.5-163)

<p>★ Recommended Wildlife Crossings</p> <p>● Milepoints</p> <p>—+— Railways</p> <p>■ Current Conservation Easements</p> <p>■ Potential Development</p> <p>▭ Proposed Reservoir</p>	<p>Zoning (Non-Public)*</p> <p>■ Agricultural</p> <p>■ Community Center</p> <p>■ Planned Unit Development</p> <p>■ Rural Residential</p> <p>■ Suburban Residential</p> <p>■ Town Boundary</p>	<p>Land Manager</p> <p>■ BLM</p> <p>▨ State</p> <p>▨ NGO/Land Trust**</p> <p>▨ Private Conservation</p> <p>■ USFS</p>	<p>■ Wilderness</p> <p>■ Recommended Wilderness</p> <p>Eagle Valley Regional Trail System</p> <p>▬ Proposed</p> <p>▬ Existing/Under Construction</p>	<p>BLM Routes</p> <p>▬ Motorized</p> <p>▬ Non-motorized</p> <p>▬ Other Designation</p> <p>▬ Technical Rock Crawling Only</p> <p>▬ Undesignated***</p>	<p>WRNF Routes</p> <p>▬ Existing</p> <p>▬ Decommission****</p> <p>* Agriculture = Resource and Resource Limited (35 acre lots and larger) Community Center = Fulford Historical, Commercial General and Limited, Industrial, Residential Multi-Family and Rural Centers Rural Residential = Agricultural Residential (10 acre lots), Agriculture Limited (5 acre lots), Rural Residential (2 acre lots) Suburban Residential = Residential Suburban Low and Medium Density ** Includes Denver Water Board *** Current use continues until route designated **** Planned or completed decommissioning</p>
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Sources: BLM, CDOT, COMaP v10, Eagle County, ECO-Resolutions, ESRI, RMW, USFS, USGS Map prepared by RMW 11/2018 17-136

0 0.5 1 Miles

7. I-70, Red Sandstone

Mileposts: 174-177

Objectives: Reduce WVC with moose

Land Ownership: Private, National Forest

Road Type: Four-lane interstate

Wildlife Score (Max = 10)	Safety Score* (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
5.3	3	8.3 [Rank 10/16]	6.5	14.8 [Rank 10/22]

*Score based on available WVC crash and carcass datasets and local knowledge.

Primary Target Species	Movement Type	Population Value to Species	WVC Rate
Moose	Local, dispersal into Homestake Creek drainage	High	Low, but severe
Mule Deer	Migration, local movements within summer range	Moderate	Low
Secondary Target Species			
Black Bear		Low	Low
Elk		Low	Low
Mountain Lion		Low	Low

*WVC rates may decrease with the completion of wildlife exclusion fence through this segment.

The primary concern in the Red Sandstone linkage area is the potential for WVC with moose, which funnel from Red Sandstone Creek to the Gore Creek drainage, following riparian habitat. WVC crashes with moose are highest at MP 175 and 175.7-176. The linkage area is heavily developed and includes the urban/commercial center of Vail, access to the ski area, and surrounding residential and recreation activity. Ongoing growth, traffic, new roads, fencing, motorized recreation and dispersed recreation activity threaten wildlife activity and movement through this linkage. In addition, a proposal to develop an additional base area for Vail Resorts at this location would decrease the value of this area for wildlife (the current permit application expires in 2020).

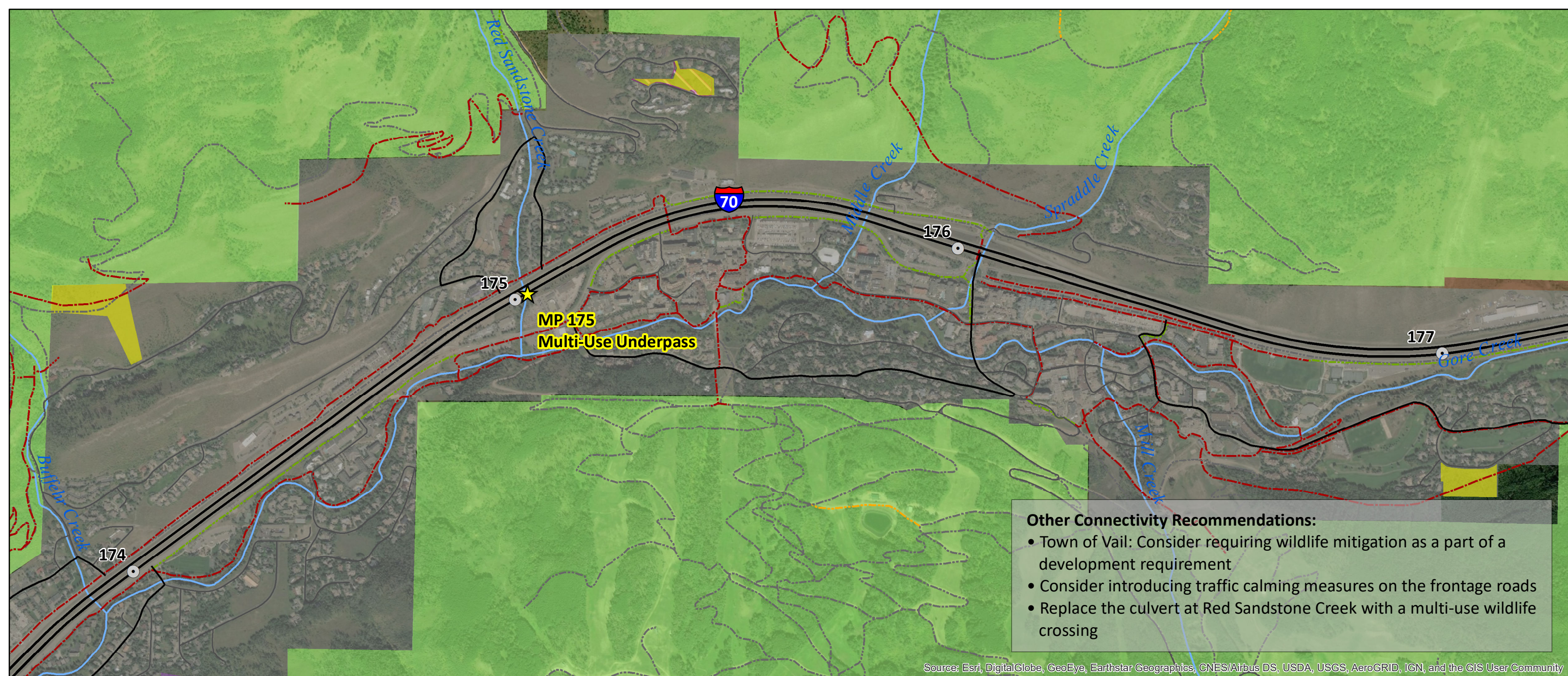
An underpass was recently rebuilt under I-70 at Simba Run to improve traffic flows, but no wildlife considerations were included. The Gore Creek riparian corridor runs parallel to the interstate south of this location. Both Red Sandstone Creek and Middle Creek currently drain under I-70 via corrugated metal pipe culverts. Kintsch et al (2011) identified Red Sandstone Creek as a location for restoring aquatic connectivity for mottled sculpin in the I-70 EcoLogical project.

Preliminary Connectivity Recommendations and Opportunities

- Investigate opportunities to construct a crossing structure to facilitate moose movements under I-70 and the frontage roads to provide a connection at Red Sandstone Creek (MP 175).
 - Replace the culvert at Red Sandstone Creek with a multi-use culvert for pedestrians, improvements to the stream crossing and terrestrial wildlife passage.
- Town of Vail: Consider requiring wildlife mitigation as a part of a development requirement. New development here would likely involve moving the south side frontage road adjacent to I-70.
- Consider introducing traffic calming measures on the frontage roads to reduce traffic speeds in select locations.

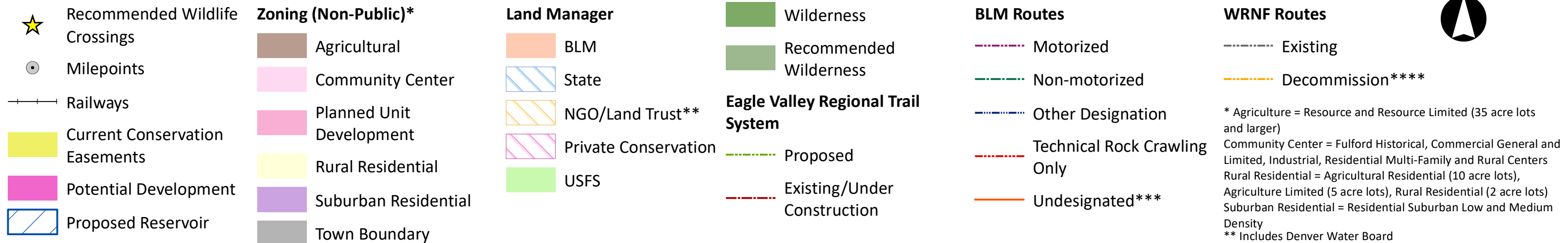


Existing pipe culvert (outlet) at Red Sandstone Creek

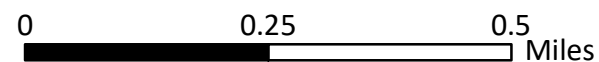


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

I-70 Red Sandstone (MP 174-177)



Sources: BLM, CDOT, COMaP v10, Eagle County, ECO-Resolutions, ESRI, RMW, USFS, USGS Map prepared by RMW 11/2018 17-136



8. I-70, Wolcott

Mileposts: 155.5-157.5

Objectives: Reduce WVC with deer, which continue to occur despite wildlife exclusion fence, and restore permeability for primarily for deer, elk and other wildlife.

Land Ownership: Private, BLM

Road Type: Four-lane interstate

Wildlife Score (Max = 10)	Safety Score* (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
7.3	1	8.3 [Rank 10/16]	5.5	13.8 [Rank 12/22]

**While this segment of I-70 has had high rates of WVC in the past, it now has wildlife exclusion fence throughout the segment, except at the interchange.*

Primary Target Species	Movement Type	Population Value to Species	WVC Rate
Canada Lynx	Dispersal	High	Low
Elk	Migration	High	Very High*
Mule Deer	Migration	High	Very High*
Secondary Target Species			
Black Bear		Low	Low
Mountain Lion		Low	Low
Pronghorn		Low	Low

**WVC rates may decrease with the completion of wildlife exclusion fence through this segment.*

This segment marks a historical movement area for migratory deer and elk, as well as black bear, mountain lion, pronghorn and, more recently, dispersing Canada lynx. Prior to the construction of wildlife exclusion fence through this segment in 2008 (completed 2010), WVC rates were the highest along this segment in the I-70 corridor in Eagle County. Despite the fencing construction, WVC continue to occur. North-south movements across I-70, however, are now inhibited, although the need for wildlife connectivity at this nexus point remains high. Existing structures (the SH 131 interchange at MP 156.5 and a concrete box culvert at MP 157.2) are unsuitable for ungulate passage

and offer limited value for carnivores. The paved SH 131 interchange receives regular traffic, while passage through the box culvert is limited by debris and sediment build-up inside of the culvert as well as a gate across the culvert entrance.

In addition to north-south movements across I-70, east-west movements across SH131 are part of a valley-wide mule deer migration corridor along the north side of I-70. Much of this linkage area is also identified as winter range for deer and elk.

US 6, the railroad, and the Eagle River all run north of I-70 through this segment. The landscape adjacent to the highway corridor is primarily agricultural, with some commercial activity towards the western end of the linkage. A golf course is located up on the mesa to the south, with associated exurban development. Future development in this linkage presents the largest threat to wildlife movement and is likely to involve moving the US 6 alignment closer to I-70.

Preliminary Connectivity Recommendations and Opportunities

- Tighten fence ends at the Wolcott/SH 131 interchange (MP 155.5) to prevent wildlife ingress into the fenced right-of-way. Specifically,

- Wildlife fence on the north side of I-70 stops well short of the pavement on both sides of SH 131 on the north side of I-70. From the existing fence ends, run additional fencing perpendicular to the current fence line up to the on/off ramps and then continue the fencing between the ramps and the interstate. Breakaway fence posts may be used to bring the fence close to the



Wildlife fence end on the northwest side of I-70 at the SH

pavement edge. In addition, a second section of fencing could extend from the current fence end towards SH 131 and angle back perpendicular to SH 131 to direct wildlife away from the interchange.

- On the south side of I-70, replace the cattle guard with a deer guard and completely attach the wildlife fence to the edge of the guard (see design on SH 9, Grand County). Consider a 2' wide grate across the guard to accommodate pedestrian and bike access.
- Investigate opportunities to construct new wildlife crossing structures, for example:

- Install a wildlife overpass at MP 157.5 where cut slopes are present on either side of I-70. This location corresponds with the highest rate of WVC accidents on I-70 in Eagle County and it provides the nearest connection between BLM lands to the north and south of I-70.



Potential location for a wildlife overpass over I-70 around MP 157.5

- Improve functionality of existing structures for wildlife. Specific recommendations include:

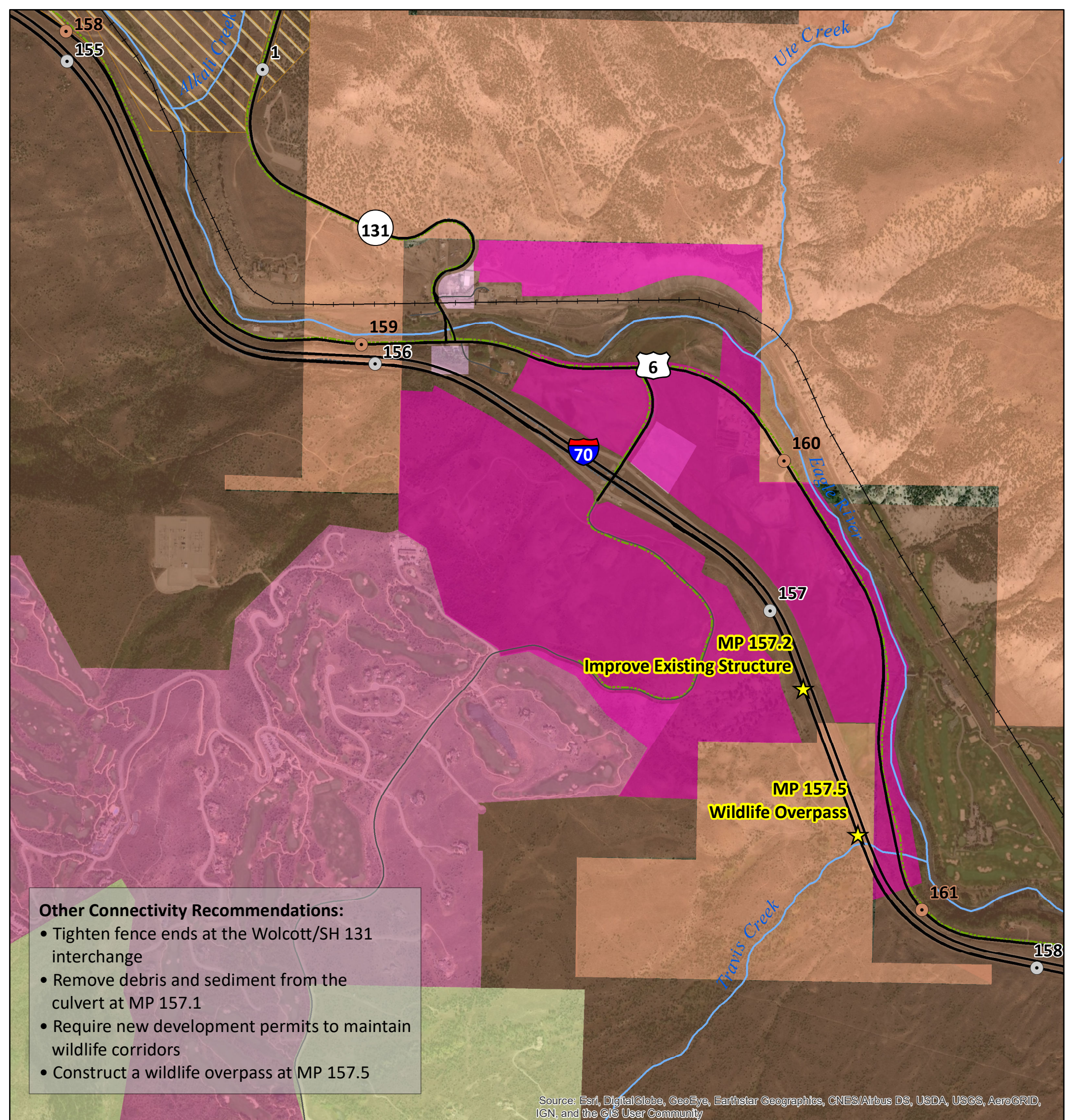
- Improve functionality of concrete box culvert at MP 157.2 for carnivores and small fauna by removing debris and sediment from the culvert and implement measures to prevent future sedimentation inside the culvert. Coordinate



Debris and sediment inside the stock pass culvert at MP 157.2

with the landowner to remove any fencing or gates that may restrict wildlife passage, and to engage them in wildlife conservation efforts on their property.

- Pursue land conservation and/or measures to limit development throughout this linkage, particularly around potential wildlife crossing structures. Notably, the PUD around MP 156-157.5 is a threat to wildlife movement in this linkage. The current permit application has expired; new permit approvals should require wildlife corridors be maintained.

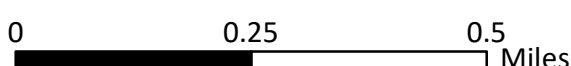


- Other Connectivity Recommendations:**
- Tighten fence ends at the Wolcott/SH 131 interchange
 - Remove debris and sediment from the culvert at MP 157.1
 - Require new development permits to maintain wildlife corridors
 - Construct a wildlife overpass at MP 157.5

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

I-70 Wolcott (MP 155.5-157.5)

★ Recommended Wildlife Crossings	Current Conservation Easements	Eagle Valley Regional Trail System	WRNF Routes
● Milepoints	Potential Development	Proposed	Existing
—+— Railways	Wilderness	Existing/Under Construction	Decommission****
Proposed Reservoir	Recommended Wilderness	BLM Routes	
Zoning (Non-Public)*	Land Manager	Motorized	* Agriculture = Resource and Resource Limited (35 acre lots and larger)
Agricultural	BLM	Non-motorized	Community Center = Fulford Historical, Commercial General and Limited, Industrial, Residential
Community Center	State	Other Designation	Rural Residential = Agricultural Residential (10 acre lots), Agriculture Limited (5 acre lots), Rural Residential (2 acre lots)
Planned Unit Development	NGO/Land Trust**	Technical Rock Crawling Only	Suburban Residential = Residential Suburban Low and Medium Density
Rural Residential	Private Conservation	Undesignated***	** Includes Denver Water Board
Suburban Residential	USFS		*** Current use continues until route designated
Town Boundary			**** Planned or completed decommissioning



Sources: BLM, CDOT, COMaP v10, Eagle County, ECO-Resolutions, ESRI, RMW, USFS, USGS
Map prepared by RMW 11/2018 17-136

9. I-70, East Vail

Mileposts: 177-182.5

Objectives: Reduce WVC with elk and deer

Land Ownership: Forest Service, Private, Town of Vail

Road Type: Four-lane interstate

Wildlife Score (Max = 10)	Safety Score* (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
3.3	3	6.3 [Rank 13/16]	6.5	12.8 [Rank 14/22]

*Score based on available WVC crash and carcass datasets and local knowledge.

Primary Target Species	Movement Type	Population Value to Species	WVC Rate
Elk	Winter range	Moderate	Moderate
Mule Deer	Migration, local movements in summer range	Moderate	Moderate
Secondary Target Species			
Bighorn Sheep	Winter range	Moderate	Low
Boreal Toad	Local		Low
Moose	Dispersal, winter range	Moderate	Low

The linkage encompasses summer range as well as winter range for elk and moose. The golf course, along with landscaping and road salts act as attractants for wildlife. Bighorn sheep that winter along the north side of I-70 descend to the highway to lick road salts along the road shoulders, as well as on the north side frontage road. This segment was also identified as a primary habitat connection across I-70 for deer and elk in the Phase I wildlife connectivity assessment. Wildlife-vehicle collisions range from low in the western portion of the linkage area to moderate in the eastern portion. WVC with bighorn sheep and moose are low but when they do occur have a large impact on the local population.

Other barriers to wildlife movement through the linkage include residential development and human activity, including dogs.

There are several existing structures under I-70 within the linkage area. These include:

- Paved access road underpasses at MP 177.4, 178.8, and 180.6 – these structures likely receive only incidental wildlife use.
- A large, divided span bridge at MP 181 is flanked by steep slopes to the north and apartment complexes immediately to the south. A chain link fence extends partially across the south entrance; however, gaps in the fence likely allow some wildlife passage.
- A large, divided span bridge at MP 182 crosses over Gore Creek and the terminus of US 6 at the base of Vail Pass, which is regularly used for trailhead parking during the winter months. The bridge provides recreation access to the Gore Creek drainage. A summer trailhead is located farther east. This bridge spans a large natural area and human activity is largely concentrate at the western edge of the span, leaving a functional passage for wildlife.

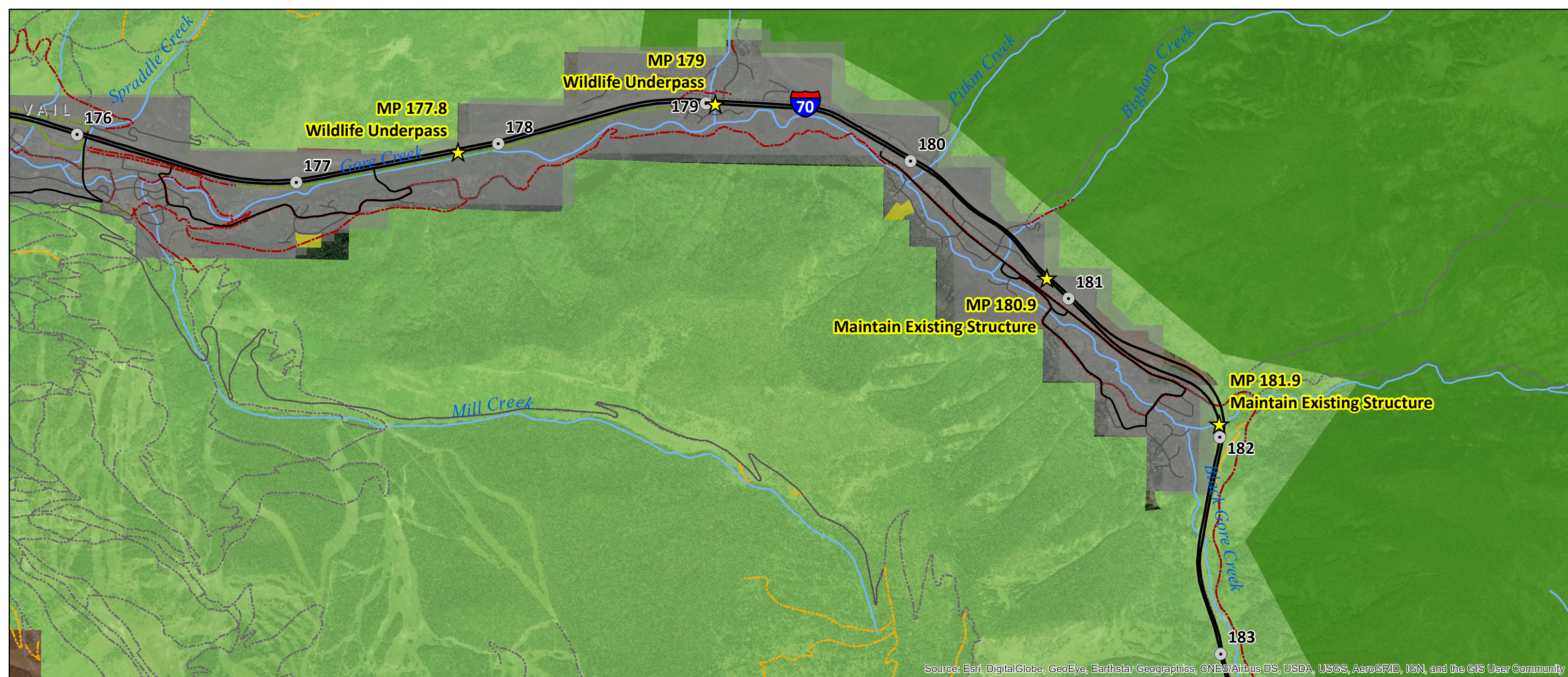
The valley bottom through this linkage area on either side of I-70 is primarily in private ownership, although the Town of Vail owns various open spaces in the valley, including the Vail Golf Club. The hillsides to the north and south are part of the White River National Forest. The landscape adjacent to the interstate is largely composed of residential developments, while Forest Service lands are composed of various forest types. Dispersed recreation – both winter and summer – is common on Forest lands.

Increases in dispersed winter recreation as well as summer recreation activities may cause some displacement of wildlife activity. While much of the valley is built out, ongoing development will further impede wildlife movement through the linkage, particularly north-south movements across I-70. Fencing around residential areas also impedes wildlife movement. Several large span bridges are present in the linkage; improvements at these locations may increase safe passage

opportunities for wildlife under I-70. Notably, unlike much of I-70 through Eagle County, this portion of I-70 remains unfenced.

Preliminary Connectivity Recommendations and Opportunities

- Add wildlife exclusion fence along the north side of I-70 between the span bridges at MP 181 and 182 to reduce WVC that occur when animals from the north come down towards the highway to access road salts or forage.
- Coordinate with East Vail neighborhood on the development of highway mitigation measures while considering the neighborhood's concerns regarding wildlife activity and damage to landscaping.
- Investigate opportunities to construct new wildlife crossing structures, for example:
 - A wildlife underpass around MP 177.8 where there is a natural break in the cliffs on the north side of I-70 that feeds into the golf course south of I-70.
 - Replace the Booth Creek pipe culvert at MP 179 with a wildlife underpass.



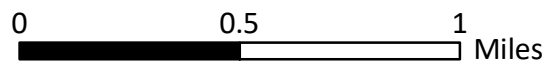
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

I-70 East Vail (MP 177-182.5)

<ul style="list-style-type: none"> Recommended Wildlife Crossings Milepoints Railways Current Conservation Easements Potential Development Proposed Reservoir 	<p>Zoning (Non-Public)*</p> <ul style="list-style-type: none"> Agricultural Community Center Planned Unit Development Rural Residential Suburban Residential Town Boundary 	<p>Land Manager</p> <ul style="list-style-type: none"> BLM State NGO/Land Trust** Private Conservation USFS 	<p>Wilderness</p> <ul style="list-style-type: none"> Wilderness Recommended Wilderness <p>Eagle Valley Regional Trail System</p> <ul style="list-style-type: none"> Proposed Existing/Under Construction 	<p>BLM Routes</p> <ul style="list-style-type: none"> Motorized Non-motorized Other Designation Technical Rock Crawling Only Undesignated*** 	<p>WRNF Routes</p> <ul style="list-style-type: none"> Existing Decommission****
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* Agriculture = Resource and Resource Limited (35 acre lots and larger)
 Community Center = Fulford Historical, Commercial General and Limited, Industrial, Residential Multi-Family and Rural Centers
 Rural Residential = Agricultural Residential (10 acre lots), Agriculture Limited (5 acre lots), Rural Residential (2 acre lots)
 Suburban Residential = Residential Suburban Low and Medium Density
 ** Includes Denver Water Board
 *** Current use continues until route designated
 **** Planned or completed decommissioning

Sources: BLM, CDOT, COMaP v10, Eagle County, ECO-Resolutions, ESRI, RMW, USFS, USGS Map prepared by RMW 11/2018 17-136



10. I-70, Strawberry Fields

Mileposts: 140-143

Objectives: Reduce WVC; maintain permeability across US 6

Land Ownership: Private, Gypsum Ponds State Wildlife Area south of I-70; mostly BLM north of I-70

Road Type: Four-lane interstate

Wildlife Score (Max = 10)	Safety Score* (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
3.3	3	6.3 [Rank 13/16]	4.5	10.8 [Rank 18/22]

*Score based primarily on available WVC crash and carcass data from I-70 & US 6.

Primary Target Species	Movement Type	Population Value to Species	WVC Rate*
Elk	Migration, daily along river corridor in winter range	High	Moderate I-70 and US 6
Mule Deer	Migration, daily along river corridor in winter range	High	Moderate I-70 and US 6
Secondary Target Species			
Pronghorn		Low	Low

*Includes WVC on I-70 and US 6.

This segment of I-70 extends from the east side of Gypsum, paralleling the riparian corridor of the Eagle River and associated ponds, which attract a variety of wildlife. This landscape is characterized by rolling sagebrush hills along the north side of I-70 and the broad Eagle River valley on the south side. US 6 parallels the interstate on the south side of the Eagle River. The north side of I-70 is a more natural landscape with high levels of motorized recreation. On the south side of I-70 there is a State Wildlife Area as well as suburban, commercial and industrial development, including the Eagle County Airport, a gypsum plant, gravel pits and a railroad storage area.

CPW identifies this segment as a highway crossing zone for deer and elk. Both mule deer and elk migrate into this area in the fall to spend the winter months in the low elevation valley; this area is, accordingly, mapped as deer and elk winter range. During winter, deer and elk make daily movements along the Eagle River corridor, parallel to the interstate. Prior to the installation of wildlife fencing, severe weather conditions induced cross-highway movements to the south-facing slopes north of I-70. Wildlife has largely adapted to the wildlife exclusion fencing through this segment, which has been present since 1979.

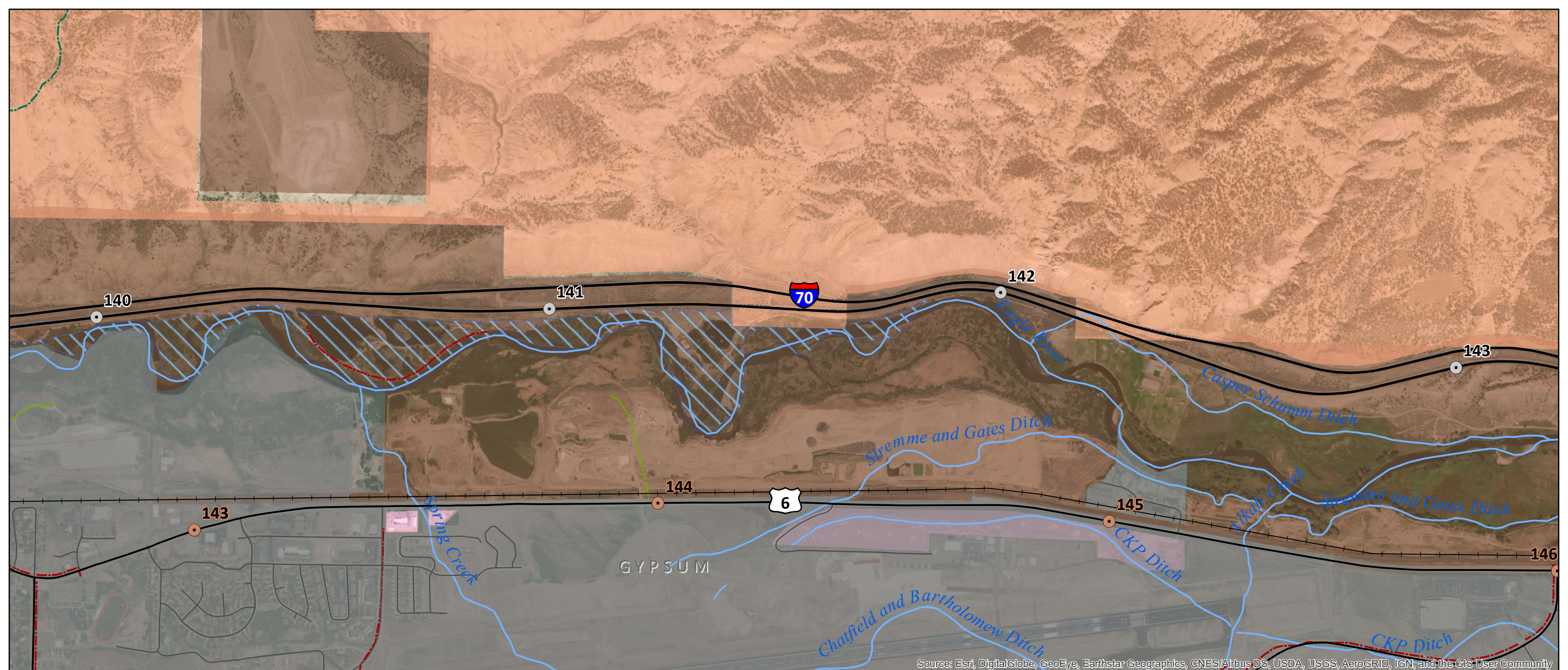
Wildlife-vehicle collisions (WVC) are generally low on I-70 due to the long-term presence of wildlife fencing but have not been eliminated. Over the last ten years, the highest number of WVC in this segment occurred between MP 142-143. Where WVC occur, they are likely the result of animals entering the fenced right-of-way through holes in the fence or at interchanges. In 2016 a new escape ramp was constructed east of the Gypsum interchange to provide an escape for animals that enter the fenced right-of-way at the interchange. To some extent, the WVC problem has shifted to US 6 – over the last 10 years, this segment of US 6 has experienced the highest rate of WVC compared to the rest of US 6 in Eagle County.

Ongoing development between Gypsum and Eagle, including the conversion of agricultural lands to development is the greatest threat to wildlife activity and wildlife movement, both east-west along the riparian corridor and north-south across US 6 and, to the extent still possible, I-70. Several developments have already been approved in this area and the potential for additional build out continues.

Preliminary Connectivity Recommendations and Opportunities:

- Tighten wildlife exclusion fencing around the Gypsum interchange.

- Add rumble strips to the on/off ramps to alert traffic in advance of the wildlife fence ends.
- Pursue land conservation along the Eagle River between I-70 and US 6 to preserve open spaces and east-west wildlife movements along the riparian corridor.
- Implement targeted, seasonal warning signage on US 6.



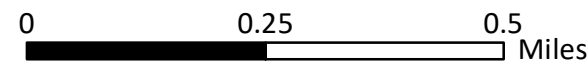
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

I-70 Strawberry Fields (MP 140-143)

<ul style="list-style-type: none"> Milepoints Railways Current Conservation Easements Potential Development Proposed Reservoir 	<p>Zoning (Non-Public)*</p> <ul style="list-style-type: none"> Agricultural Community Center Planned Unit Development Rural Residential Suburban Residential Town Boundary 	<p>Land Manager</p> <ul style="list-style-type: none"> BLM State NGO/Land Trust** Private Conservation USFS 	<ul style="list-style-type: none"> Wilderness Recommended Wilderness <p>Eagle Valley Regional Trail System</p> <ul style="list-style-type: none"> Proposed Existing/Under Construction 	<p>BLM Routes</p> <ul style="list-style-type: none"> Motorized Non-motorized Other Designation Technical Rock Crawling Only Undesignated*** 	<p>WRNF Routes</p> <ul style="list-style-type: none"> Existing Decommission****
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* Agriculture = Resource and Resource Limited (35 acre lots and larger)
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 Suburban Residential = Residential Suburban Low and Medium Density
 ** Includes Denver Water Board
 *** Current use continues until route designated
 **** Planned or completed decommissioning

Sources: BLM, CDOT, COMaP v10, Eagle County, ECO-Resolutions, ESRI, RMW, USFS, USGS Map prepared by RMW 11/2018 17-136



11. I-70, Eagle-Vail

Mileposts: 167-169.5

Objectives: Maintain local wildlife movements.

Land Ownership: Private, National Forest

Road Type: Four-lane interstate

Wildlife Score (Max = 10)	Safety Score* (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
4	1	5 [Rank 15/16]	5	10 [Rank 20/22]

**While this segment of I-70 has had high rates of WVC in the past, it now has wildlife exclusion fence throughout the segment, except at the interchange. Some WVC continue to occur on US 6.*

Primary Target Species	Movement Type	Population Value to Species	WVC Rate*
Elk	Winter range	Low	Moderate*
Mule Deer	Migration, winter range	High	Moderate*
Secondary Target Species			
Black Bear	Local	Low	Low
Mountain Lion	Local	Low	Low

**WVC rates may decrease with the completion of wildlife exclusion fence through this segment.*

This segment of I-70 and the Eagle River Valley is characterized by commercial and suburban development around the Eagle-Vail Golf Course, which serves as an attractant for wintering elk. The slopes north of I-70 are part of a valley-wide mule deer migration corridor. The hillsides along the north side of I-70 also provide winter range for mule deer and elk. South of I-70 the river valley and adjacent hillsides and drainages are also identified as winter range for elk. Mountain lions and, increasingly, moose have also been observed in this area. Much of this segment from Avon to the bridge over US 6 and the Eagle River (MP 167-168.9) is identified as a highway crossing zone for deer by CPW. WVC accidents and carcass reports are moderate relative to other segments of I-70 in Eagle County. Wildlife exclusion fencing was

erected along the north side of I-70 in 2009; the fence was completed on the south side of the interstate in 2017.

An existing railroad bridge over US 6, the railroad and the Eagle River (MP 168.9) currently offers the only safe passage opportunity for wildlife to move under I-70. The riparian banks are steep, with the exception of the railroad bed and a dirt access road, and human activity is common. While the valley is already heavily developed, ongoing development and increasing recreation activities further threaten wildlife movement in this linkage area.

Preliminary Connectivity Recommendations and Opportunities

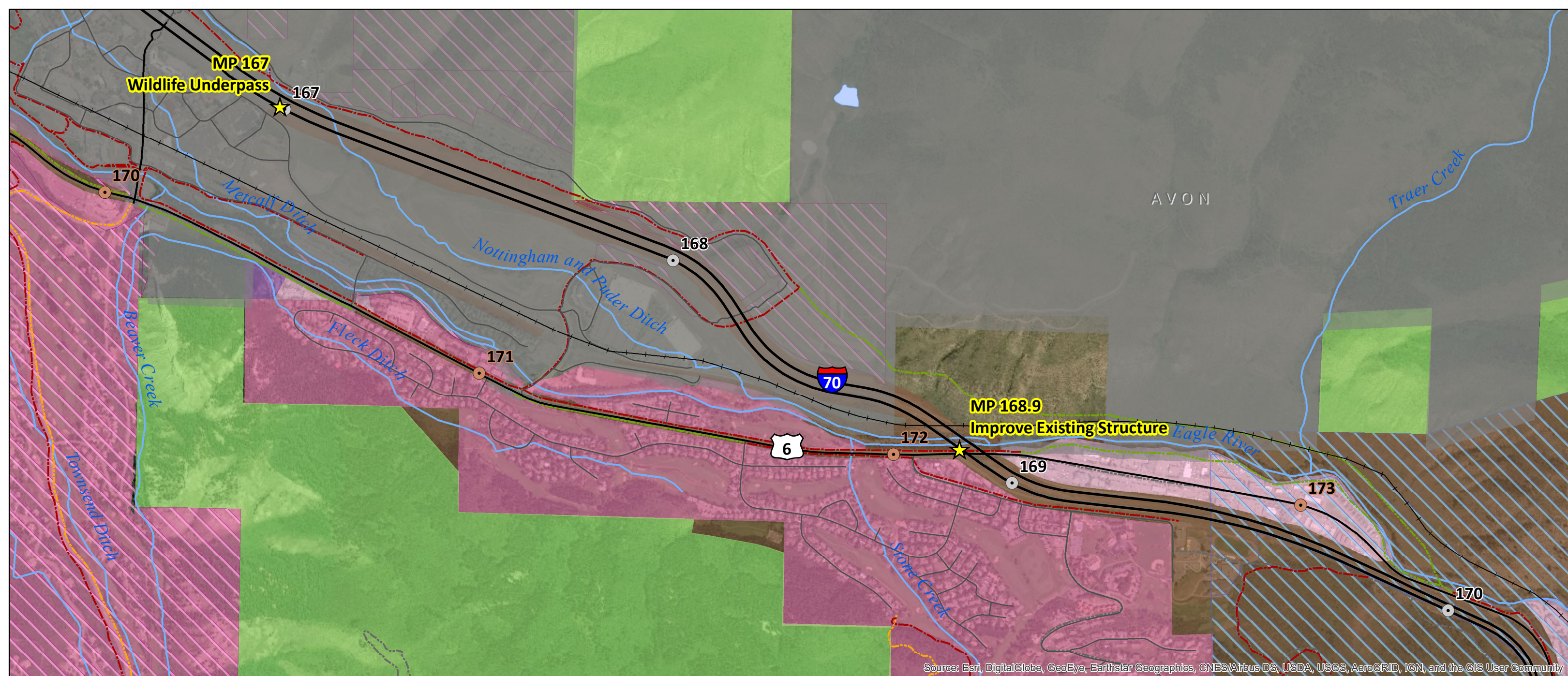
- Maintain east-west wildlife movements on either side of I-70 and improve safe crossing opportunities across I-70 and US 6.
- Pursue land conservation and/or measures (e.g., zoning) to limit development on remaining undeveloped lands along the Eagle River, though notably there are limited opportunities remaining.
- Investigate opportunities to construct new wildlife crossing structures, for example:
 - Replace pipe culvert at Swift Gulch (MP 167) with a wildlife underpass suitable for deer and other fauna.
- Improve functionality of existing structures for wildlife. Specific recommendations include:
 - Determine how human activity may be reduced under the highway bridge over US 6 and the Eagle River at MP 168.9.
- Install specifically-designed deer guards across I-70 on/off ramps to prevent wildlife incursions into the fenced right-of-way



I-70 bridge over US 6, railroad and the Eagle River at MP 168.9

or, at a minimum, add rumble strips to the on/off ramps to slow traffic near the wildlife fence ends.

- Tie wildlife mitigation actions into upcoming pavement project on US 6 between Avon and Minturn.



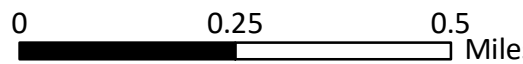
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

I-70 Eagle-Vail (MP 167-169.5)

<ul style="list-style-type: none"> Recommended Wildlife Crossings Milepoints Railways Current Conservation Easements Potential Development Proposed Reservoir 	<p>Zoning (Non-Public)*</p> <ul style="list-style-type: none"> Agricultural Community Center Planned Unit Development Rural Residential Suburban Residential Town Boundary 	<p>Land Manager</p> <ul style="list-style-type: none"> BLM State NGO/Land Trust** Private Conservation USFS 	<p>Wilderness</p> <ul style="list-style-type: none"> Wilderness Recommended Wilderness <p>Eagle Valley Regional Trail System</p> <ul style="list-style-type: none"> Proposed Existing/Under Construction 	<p>BLM Routes</p> <ul style="list-style-type: none"> Motorized Non-motorized Other Designation Technical Rock Crawling Only Undesignated*** 	<p>WRNF Routes</p> <ul style="list-style-type: none"> Existing Decommission****
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* Agriculture = Resource and Resource Limited (35 acre lots and larger)
 Community Center = Fulford Historical, Commercial General and Limited, Industrial, Residential Multi-Family and Rural Centers
 Rural Residential = Agricultural Residential (10 acre lots), Agriculture Limited (5 acre lots), Rural Residential (2 acre lots)
 Suburban Residential = Residential Suburban Low and Medium Density
 ** Includes Denver Water Board
 *** Current use continues until route designated
 **** Planned or completed decommissioning

Sources: BLM, CDOT, COMaP v10, Eagle County, ECO-Resolutions, ESRI, RMW, USFS, USGS Map prepared by RMW 11/2018 17-136



12. I-70, West Avon

Mileposts: 163-167

Objectives: Maintain east-west mule deer migration and restore connectivity across I-70

Land Ownership: Private, Forest Service, Town of Avon

Road Type: Four-lane interstate

Wildlife Score (Max = 10)	Safety Score* (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
2.7	1	3.7 [Rank 16/16]	6	9.7 [Rank 21/22]

**While this segment of I-70 has had high rates of WVC in the past, it now has wildlife exclusion fence throughout the segment, except at the interchange.*

Primary Target Species	Movement Type	Population Value to Species	WVC Rate*
Elk	Migration, winter range	Moderate	High*
Mule Deer	Migration, winter range	Moderate	High*

**WVC rates may decrease with the completion of wildlife exclusion fence through this segment.*

The West Avon linkage area includes suburban and urban development adjacent to I-70 and US 6, with the lands farther north and south characterized as low density residential or natural. Recreation activity is also common in this linkage area including both developed recreation (e.g., golf courses) and dispersed motorized and non-motorized recreation of public lands owned by the Forest Service and the Town of Avon. Currently, seasonal trail closures are in place at the West Avon Preserve. Note that the segment of US 6 is considered independently and is not included in this linkage.

The slopes north of I-70 are part of a valley-wide mule deer migration corridor. The south-facing slopes north of I-70 are also identified as mule deer winter range. Elk winter range is extensive and includes natural habitat and golf courses both north and south of the interstate. The segment is identified as a highway crossing zone for deer and elk

by CPW. Ungulate activity across I-70 was typically related to movements within winter range, as opposed to migratory movements.

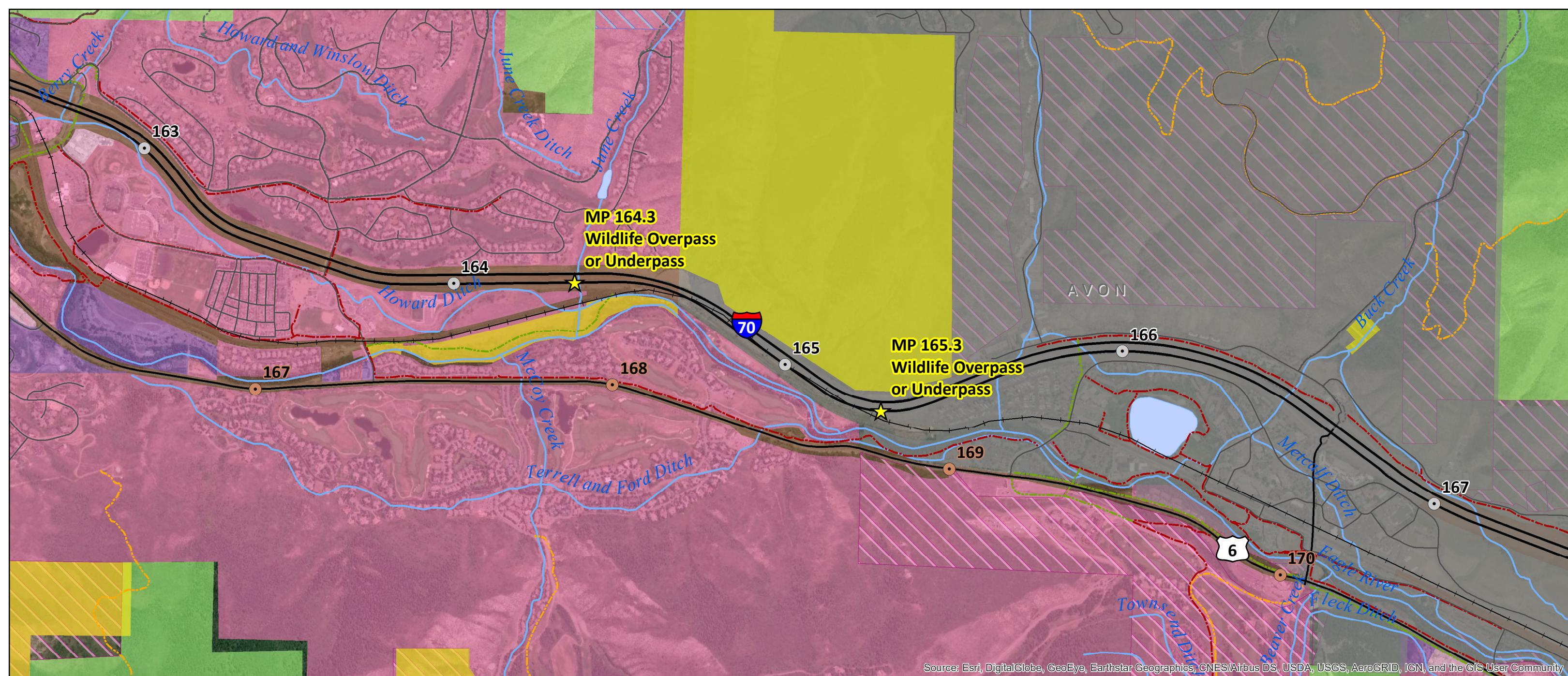
Wildlife exclusion fencing was erected in this segment in 2010, with the last section of wildlife fence completed in 2017. WVC rates in this segment were high prior to the construction of the fencing. Fifty-three WVC accidents were reported to law enforcement from 2007-2010, prior to the construction of the wildlife fence. From 2011-2016, 26 WVC accidents were reported, although, notably, the fencing was not fully complete until 2017. WVC carcass reports display a similar pattern, recording 149 WVC carcass from 2007-2010 – including 56 elk – decreasing to 68 WVC carcasses from 2011-2016, including only three elk. This represents a decrease in WVC from 12.4 carcasses/mile/year to 2.8 carcasses/mile/year, and a decrease in WVC accidents from 3.3 accidents/mile/year to 1.1 accidents/mile/year.

Preliminary Connectivity Recommendations and Opportunities

- Pursue land conservation and/or measures (e.g., zoning) to limit development on remaining undeveloped lands along the Eagle River.
- Encourage better enforcement of seasonal trail closures at the West Avon Preserve.
- Investigate opportunities to construct new wildlife crossing structures to provide north-south crossing opportunities under I-70 that support current wildlife movements as well as potential shifts in wildlife movement in the future. For example:
 - June Creek, MP 164.3. A crossing structure at this location would need to address impacts on the golf courses on either side of I-70.
 - MP 165.3 – This location marks a point where I-70, the Eagle River and US 6 are in close proximity; and where

there are protected lands north of I-70 (White River National Forest) and south of US 6 (Colorado Open Lands conservation easement). In between the two highways is the riparian corridor of the Eagle River, the largely inactive railroad (used occasional to move railroad cars), and the eastern end of the Arrowhead Golf Course. The Town of Avon owns a narrow property along the river corridor from MP 168.9-169.3). Notably, this is the only location within this segment with natural lands both north and south of the interstate. However, the terrain to the north and south is steep, which would present a challenge for any potential wildlife mitigation at this location.

- Install specifically-designed deer guards across I-70 on/off ramps to prevent wildlife incursions into the fenced right-of-way or, at a minimum, add rumble strips to the on/off ramps to slow traffic near the wildlife fence ends.

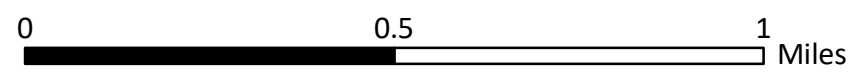


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

I-70 West Avon (MP 163-167)

Recommended Wildlife Crossings	Zoning (Non-Public)*	Land Manager	Wilderness	BLM Routes	WRNF Routes
Milepoints	Agricultural	BLM	Recommended Wilderness	Motorized	Existing
Railways	Community Center	State	Eagle Valley Regional Trail System	Non-motorized	Decommission****
Current Conservation Easements	Planned Unit Development	NGO/Land Trust**	Proposed	Other Designation	
Potential Development	Rural Residential	Private Conservation	Existing/Under Construction	Technical Rock Crawling Only	
Proposed Reservoir	Suburban Residential	USFS		Undesignated***	
	Town Boundary				

Sources: BLM, CDOT, COMaP v10, Eagle County, ECO-Resolutions, ESRI, RMW, USFS, USGS Map prepared by RMW 11/2018 17-136



* Agriculture = Resource and Resource Limited (35 acre lots and larger)
 Community Center = Fulford Historical, Commercial General and Limited, Industrial, Residential Multi-Family and Rural Centers
 Rural Residential = Agricultural Residential (10 acre lots), Agriculture Limited (5 acre lots), Rural Residential (2 acre lots)
 Suburban Residential = Residential Suburban Low and Medium Density
 ** Includes Denver Water Board
 *** Current use continues until route designated
 **** Planned or completed decommissioning

U.S. HIGHWAY 6

1. US 6, Arrowhead to Squaw Creek Mileposts: 163.5-169

Objectives: Reduce WVC and protect local wildlife movements along the Eagle River (east-west) and across US 6.

Land Ownership: Private, National Forest, Colorado Open Lands, Eagle Valley Land Trust

Road Type: Two to three lane highway

Wildlife Score (Max = 10)	Safety Score* (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
4.7	5	9.7 [Rank 7/16]	5.5	15.2 [Rank 9/22]

*Score based on available WVC crash and carcass datasets and CPW knowledge.

Primary Target Species	Movement Type	Population Value to Species	WVC Rate
Elk	Migration, winter range	High	High
Mule Deer	Migration, winter range	Moderate	High
Secondary Target Species			
Mountain Lion		Low	Low

US 6 parallels I-70 to the south through this segment, with the Eagle River running between the two highways. Multiple local roads tie into US 6 through this segment providing access to residential areas, golf courses, commercial/industrial developments and, around Avon, Arrowhead and Beaver Creek ski resorts. As of 2017, I-70 is entirely fenced through this area. However, wildlife continues to move up and down the Eagle River drainage along the south side of I-70 as well as north-south across US 6. While this area is used by both deer and elk, it is particularly valuable for elk, providing winter range and critical access to the river. Elk summering above Arrowhead and Beaver Creek descend the drainages into the Eagle River Valley. The segment of US

6 from MP 167-169 is identified by CPW as a highway crossing zone. Daily movements across US 6 by both elk and deer are common during the winter months, as wildlife seek to access open spaces along the Eagle River corridor. Extensive development throughout the valley bottom and surrounding hillsides and increasing recreation activity (including night-time grooming on the ski slopes and summer jeep tours) has greatly impacted wildlife populations and movements in this linkage area. Elk herds, which once numbered in the thousands, have dramatically decreased in size.

WVC accidents reported to law enforcement are high relative to other segments of US 6 in Eagle County. WVC carcass reports are moderate compared to other segments. WVC are most commonly recorded around MP 164-166 and MP 168.

The Eaton Ranch Preserve is located along the Eagle River on the north side of US 6 around MP 165.5 and is the only currently protected winter range along the river corridor. Some fencing has been removed from this property to facilitate wildlife movement. There are no existing structures under US 6 that are functional for ungulate passage. A bridge over Lake Creek (MP165.1) spans riprap banks and on the south side there is small bike bath bridge immediately adjacent, supported on retaining walls that do not span the riparian banks. Both this bridge and the riprap under the main bridge structure inhibit wildlife passage under the highway at this location.

Preliminary Connectivity Recommendations and Opportunities

- Pursue land conservation and/or measures (e.g., zoning, permitting requirements) to limit development or, at a minimum, maintain wildlife corridors on remaining undeveloped lands along the Eagle River, particularly adjacent to the Eaton Ranch Preserve (i.e., PUD immediately east of the preserve).
- Remove barbed wire fencing on open space lands along the Eagle River corridor.

- Improve functionality of existing structures for wildlife. Specific recommendations include:

- Lake Creek Bridge (MP 165.1) – CPW notes that there is excellent habitat in the hills north of this location, with winter range habitat in the Eagle River corridor. Determine whether the side slopes under the Lake Creek bridge are



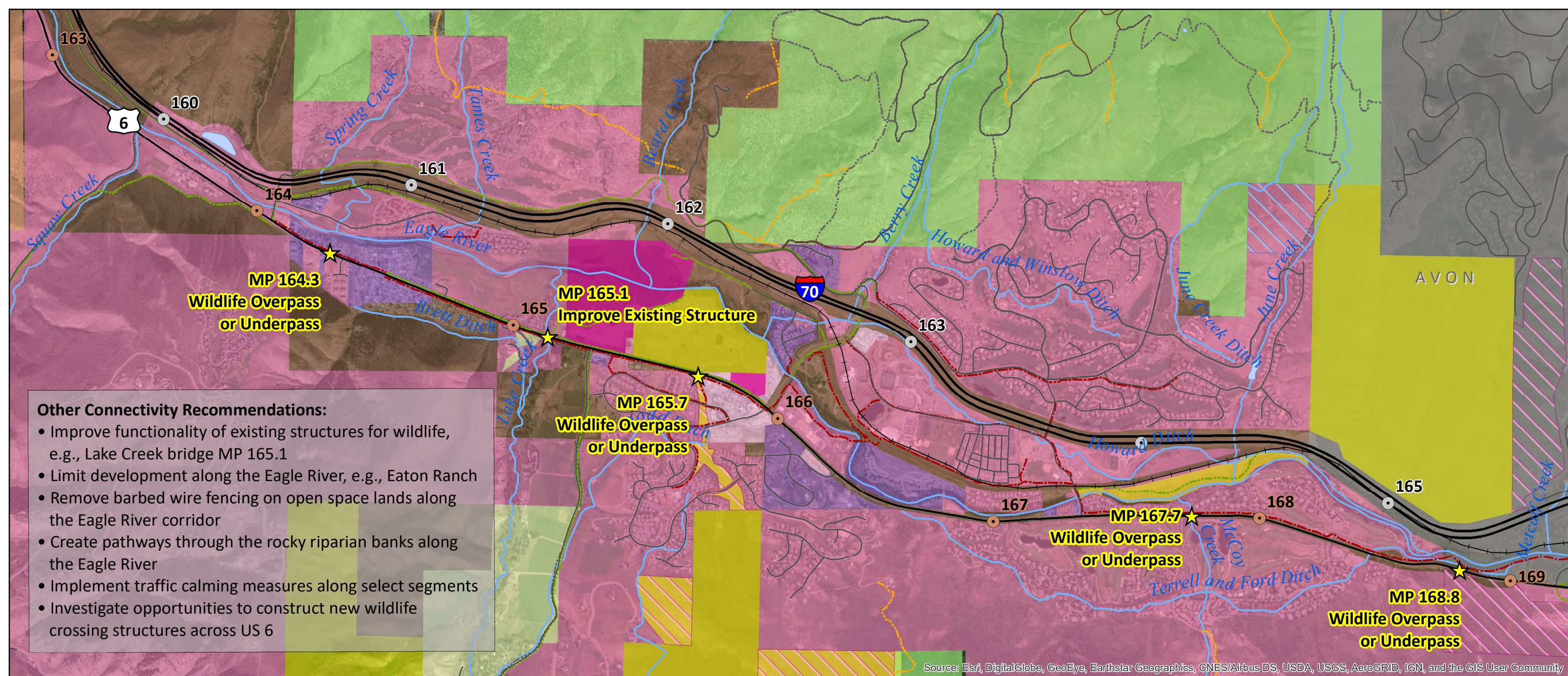
Riprap slopes under Lake Creek

shallow enough to add wildlife pathways through riprap along riparian corridor. Bike path bridge on north side of the bridge is narrower, land does not leave room for wildlife pathways. Consider guide fencing to the Lake Creek bridge and excluding the bike path bridge. Existing and future residential development may limit the utility of this bridge for wildlife passage regardless of the structure characteristics if the PUD northeast of this location becomes developed.

- Create pathways for ungulate movement through the rocky riparian banks along the Eagle River to support east-west wildlife movements along the riparian corridor.
- Consider implementing traffic calming measures along select segments of US 6 to reduce traffic speeds in the areas where wildlife is most likely to cross and install targeted, seasonal warning signage for wildlife crossing on US 6 during winter months.
- There are limited opportunities for crossing structures across US 6 due to extensive development in this linkage. Investigate opportunities to construct new wildlife crossing structures to provide north-south crossing opportunities across US 6 that

support current wildlife movements as well as potential shifts in wildlife movement in the future. For example:

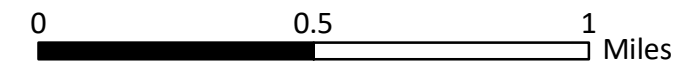
- Narrow drainage at MP 164.3. There is open space on the south side of this location.
- MP 165.7 – Where a small, narrow drainage from the south with a conservation easement between developments connects to the Eagle River Preserve on the north side of US 6. A roundabout may be installed at this location, which would slow traffic speeds on US 6.
- MP 167.7 – McCoy Creek drainage. The golf course is south of US 6 here and the Eagle River corridor is to the north. The area between the river and the railroad is under conservation easement.
- MP 168.8 - This location marks a point where I-70, the Eagle River and US 6 are in close proximity; and where there are protected lands south of US 6 (Colorado Open Lands conservation easement). In between US 6 and I-70 is the riparian corridor of the Eagle River, the largely inactive railroad (used occasionally to move railroad cars), and the eastern end of the Arrowhead Golf Course. Notably, this is the only location within this segment with natural lands both north and south of the interstate. However, the terrain to the north and south is steep, which would present a challenge for any potential wildlife mitigation at this location.



US6 Arrowhead to Squaw (MP 163.5-169)

<p>★ Recommended Wildlife Crossings</p> <p>● Milepoints</p> <p>—+— Railways</p> <p>■ Current Conservation Easements</p> <p>■ Potential Development</p> <p>▭ Proposed Reservoir</p>	<p>Zoning (Non-Public)*</p> <p>■ Agricultural</p> <p>■ Community Center</p> <p>■ Planned Unit Development</p> <p>■ Rural Residential</p> <p>■ Suburban Residential</p> <p>■ Town Boundary</p>	<p>Land Manager</p> <p>■ BLM</p> <p>▨ State</p> <p>▨ NGO/Land Trust**</p> <p>▨ Private Conservation</p> <p>■ USFS</p>	<p>■ Wilderness</p> <p>■ Recommended Wilderness</p> <p>Eagle Valley Regional Trail System</p> <p>--- Proposed</p> <p>--- Existing/Under Construction</p>	<p>BLM Routes</p> <p>--- Motorized</p> <p>--- Non-motorized</p> <p>--- Other Designation</p> <p>--- Technical Rock Crawling Only</p> <p>--- Undesignated***</p>	<p>WRNF Routes</p> <p>--- Existing</p> <p>--- Decommission****</p> <p>* Agriculture = Resource and Resource Limited (35 acre lots and larger) Community Center = Fulford Historical, Commercial General and Limited, Industrial, Residential Multi-Family and Rural Centers Rural Residential = Agricultural Residential (10 acre lots), Agriculture Limited (5 acre lots), Rural Residential (2 acre lots) Suburban Residential = Residential Suburban Low and Medium Density ** Includes Denver Water Board *** Current use continues until route designated **** Planned or completed decommissioning</p>
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Sources: BLM, CDOT, COMaP v10, Eagle County, ECO-Resolutions, ESRI, RMW, USFS, USGS Map prepared by RMW 11/2018 17-136



U.S. HIGHWAY 24

US 24 runs south of I-70, through Minturn, Red Cliff and over Tennessee Pass to Leadville. The headwaters of the Eagle River originate from these mountains. The highway descends from the Continental Divide at the top of the pass, travels through the flat meadows of Camp Hale and the WWII army training grounds. The road then descends into the broad Homestake Creek drainage. Below Red Cliff, the valley becomes steep and narrow, and the highway runs above the cliff line on the east side of the valley. The Union Pacific Railroad line parallels the highway. While inactive since the turn of the century, the tracks remain in place and future reactivation is possible, though unlikely in the foreseeable future.

1. US 24, Camp Hale

Mileposts: 153.5-166

Objectives: Preserve existing connectivity for migratory and seasonal movements of deer, elk, moose, as well as lynx and other carnivores.

Land Ownership: National Forest, Private

Road Type: Two-lane highway

Wildlife Score (Max = 10)	Safety Score* (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
8.7	1	9.7 [Rank 7/16]	6.5	16.2 [Rank 8/22]

*Score based on available WVC crash and carcass datasets.

Primary Target Species	Movement Type	Population Value to Species	WVC Rate
Canada Lynx	Dispersal, local	Very High	Low
Elk	Migration, winter range	Very High	Low
Mule Deer	Migration, summer range	Very High	Low
Secondary Target Species			
Boreal Toad	Local	High	Low
Mountain Lion	Local	High	Low

The section of US 24 from Redcliff to Tennessee Pass is largely White River National Forest, with the exception of private inholdings. It includes the wetlands along the Eagle River from Camp Hale to Redcliff, and the confluence of the Eagle River and Homestake Creek drainages. In severe winters, elk likely move both parallel to the highway and across the highway. Mule deer may cross the roadway daily during the summer season; deer migrate from this area for the winter to Mud Springs to the north or, potentially, south towards Leadville. Wetland areas from Homestake Creek to Redcliff support a resident population of elk, as well as boreal toad. The upper reaches of Tennessee Pass are recognized as a USFS lynx linkage area; the slopes south of Camp Hale (~MP 161.5-163) are identified as a habitat connection for elk (Phase I Connectivity Assessment) and as having a high probability for lynx highway crossing (Baigas et al 2017). A wetland restoration project through the former camp is being planned and implemented by the Forest Service.

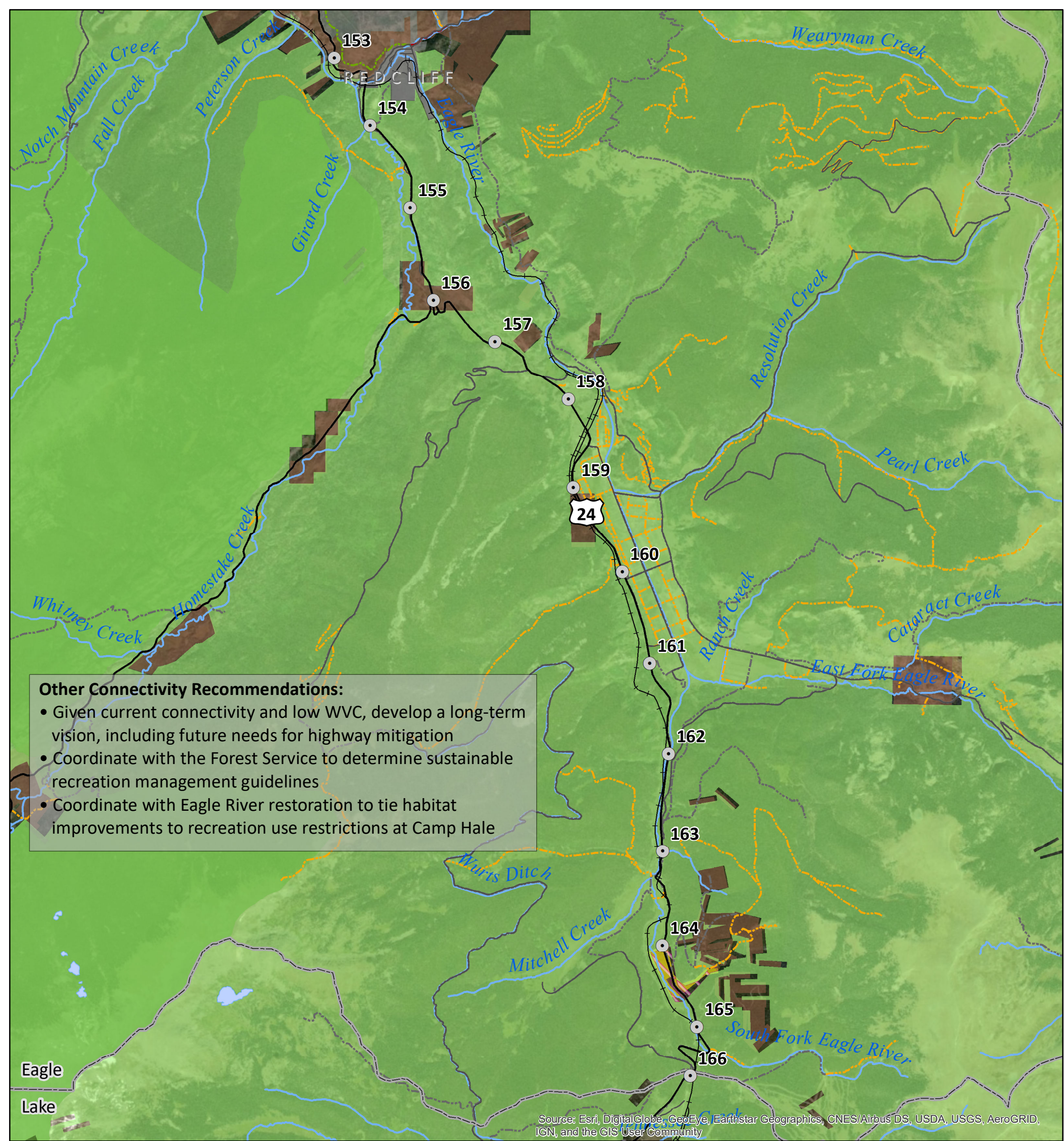
Traffic volumes are low throughout this segment, but high vehicle speeds can result in WVC, particularly around Camp Hale, where there is a spike in WVC (MP 160). Commuter traffic between Leadville and Vail at dawn and dusk may also result in higher incidence of WVC.

Camp Hale is a national historic preservation site and the area receives high levels of dispersed recreation, including the Vail Pass Winter Recreation Area and several backcountry huts to the east, and motorized recreation primarily via Nova Guides, which operates out of

this area. Wildlife movement through this linkage is threatened by ongoing increases in recreation activity throughout the year, as well current and future water development projects, and future increases in traffic volume on the highway.

Preliminary Connectivity Recommendations and Opportunities

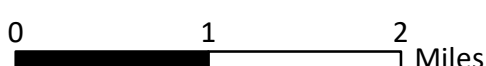
- Future infrastructure expansions and increasing traffic volumes would threaten wildlife movements through the linkage. Any new highway projects to expand the roadway should include structural mitigation measures.
 - Coordinate among partners to develop a long-term vision for the US 24 corridor highlighting the wildlife values and identifying conditions (e.g., traffic volume thresholds, roadway expansion project) that may threaten current levels of connectivity. This connectivity vision should identify where cross-highway movements are of greatest concern for consideration in future CDOT roadway projects.
 - Coordinate with the Forest Service to develop guidelines to support travel management planning and to support Forest Service responses to user group initiatives – e.g., what trail density is supportable, and what recreation guidelines or seasonal closures are needed to sustain healthy wildlife populations?
 - Coordinate with the Eagle River restoration project to tie habitat improvements to recreation use restrictions at Camp Hale.



US24 Camp Hale (MP 153.5-166)

<ul style="list-style-type: none"> ● Milepoints —+— Railways ▭ Proposed Reservoir <p>Zoning (Non-Public)*</p> <ul style="list-style-type: none"> ▭ Agricultural ▭ Community Center ▭ Planned Unit Development ▭ Rural Residential ▭ Suburban Residential ▭ Town Boundary 	<ul style="list-style-type: none"> ▭ Current Conservation Easements ▭ Potential Development ▭ Wilderness ▭ Recommended Wilderness <p>Land Manager</p> <ul style="list-style-type: none"> ▭ BLM ▭ State ▭ NGO/Land Trust** ▭ Private Conservation ▭ USFS 	<p>Eagle Valley Regional Trail System</p> <ul style="list-style-type: none"> — Proposed — Existing/Under Construction <p>BLM Routes</p> <ul style="list-style-type: none"> — Motorized — Non-motorized — Other Designation — Technical Rock Crawling Only — Undesignated*** 	<p>WRNF Routes</p> <ul style="list-style-type: none"> — Existing — Decommission**** <p>* Agriculture = Resource and Resource Limited (35 acre lots and larger) Community Center = Fulford Historical, Commercial General and Limited, Industrial, Residential Multi-Family and Rural Centers Rural Residential = Agricultural Residential (10 acre lots), Agriculture Limited (5 acre lots), Rural Residential (2 acre lots) Suburban Residential = Residential Suburban Low and Medium Density ** Includes Denver Water Board *** Current use continues until route designated **** Planned or completed decommissioning</p>
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Sources: BLM, CDOT, COMaP v10, Eagle County, ECO-Resolutions, ESRI, RMW, USFS, USGS
 Map prepared by RMW 11/2018 17-136



2. US 24, Dowd Junction to Red Cliff

Mileposts: 143.4-152.5

Objectives: Prevent future increases in WVC on US 24 and improve permeability for migrating deer and elk, lynx and other carnivores

Land Ownership: Private, National Forest, CPW

Road Type: Two-lane highway

Wildlife Score (Max = 10)	Safety Score* (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
8.7	3	9 [Rank 7/16]	5	14 [Rank 11/22]

*Score based on available WVC crash and carcass datasets and local knowledge.

Primary Target Species	Movement Type	Population Value to Species	WVC Rate
Canada Lynx	Dispersal,	Peripheral	Low
Elk	Migration, winter range	High	Low
Mule Deer	Migration, seasonal winter and summer	High	Low
Secondary Target Species			
Moose	Local	Low	Low

This segment of US 24 travels through various terrain. From I-70, the highway follows the river corridor south through the Town of Minturn. The road ascends from the valley floor around MP 148.5 and traverses steep, cliffy terrain along the west side of Battle Mountain to Redcliff. The segment north of Minturn bisects elk winter range and was identified as a habitat linkage for elk in the Phase I Connectivity Assessment. This section also has the highest rate of WVC on US 24 in Eagle County. The southern portions of this linkage, along the slopes of Battle Mountain also contain elk winter range, and several sections of highway are identified elk movement areas and highway crossing zones (MP 147; MP 150.5-152.5). Mule deer and moose movement is likely throughout this area, generally moving north-south between

Mud Springs and Tennessee Pass; no discrete crossing zones are defined. While this area is peripheral for dispersing lynx, several sections of road are identified as having a high probability for lynx crossing should lynx be moving through this area (roughly, MP 147.5-150; Baigas et al 2017).

The southern portion of this segment along Battle Mountain includes the Eagle Mine Superfund Site, which has a capped tailings pile and tailings ponds. The mine site is in private ownership. These lands and Battle Mountain to the southeast were annexed by the Town of Minturn in 2008 to facilitate a private resort development. No development has occurred to date, and the development plan has been revised to fewer units on 35-acre lots. Plans to develop a ski area or golf course on Battle Mountain have been revoked, and 67% of the property would remain as undeveloped open space. The anticipated buildout for these developments is 10-20 years. While the impacts to elk and other wildlife on the planned development are lessened due to these revisions, further increases in traffic volume (currently at 2,600 AADT) due to the new development and increasing commuter traffic from Leadville poses a threat to wildlife movement through this linkage. Increases in motorized and non-motorized recreation activity may also affect wildlife movements.

Preliminary Connectivity Recommendations and Opportunities

- Coordinate with CPW, USFS, CDOT and the Town of Minturn to identify the best locations for wildlife crossings mitigation in select areas, for example:
 - Minturn to I-70, high WVC segment and elk winter range; however, elk populations have decreased in this area. Possible opportunity to replace Grouse Creek culvert.
 - Install wildlife fencing to funnel wildlife to move under the existing bridge over the Eagle River at Tigowan Road (MP 148.3) and the retired railroad bridge (MP 148.4).

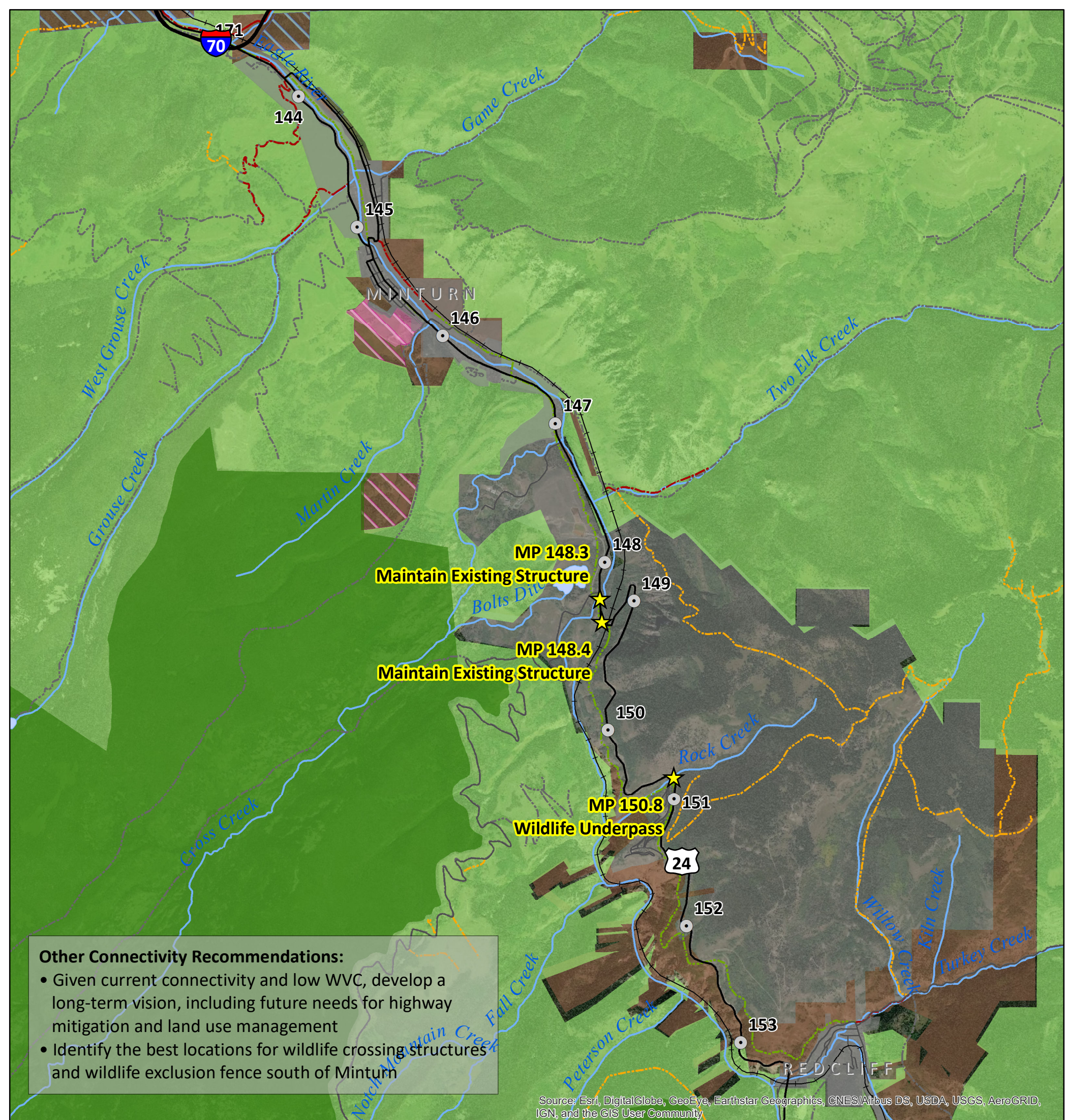


Eagle River bridge (MP 148.3)



Railroad bridge (MP 148.4)

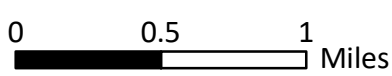
- North of Redcliff elk highway crossing zone (MP 150.5-152.5), e.g., replace the Rock Creek pipe culvert at MP 150.8 with a large wildlife underpass. This pipe will need to be replaced soon; however, CDOT would line it with plastic. Note lots of rocks in the fill at this location would require providing a traffic detour while digging out the slope to install a large structure.
- Minimize potential development and associated traffic and recreation impacts.
- Coordinate among partners to develop a long-term vision for the US 24 corridor highlighting the wildlife values and identifying conditions (e.g., traffic volume thresholds, roadway expansion project) that may threaten current levels of connectivity. This connectivity vision should identify where cross-highway movements are of greatest concern for consideration in future CDOT roadway projects and land use planning.



US24 Dowd Junction to Red Cliff (MP 143.4-152.5)

<p>★ Recommended Wildlife Crossings</p> <p>● Milepoints</p> <p>—+— Railways</p> <p>▭ Proposed Reservoir</p> <p>Zoning (Non-Public)*</p> <p>■ Agricultural</p> <p>■ Community Center</p> <p>■ Planned Unit Development</p> <p>■ Rural Residential</p> <p>■ Suburban Residential</p> <p>■ Town Boundary</p>	<p>■ Current Conservation Easements</p> <p>■ Potential Development</p> <p>■ Wilderness</p> <p>■ Recommended Wilderness</p> <p>Land Manager</p> <p>■ BLM</p> <p>▨ State</p> <p>▨ NGO/Land Trust**</p> <p>▨ Private Conservation</p> <p>■ USFS</p>	<p>Eagle Valley Regional Trail System</p> <p>▬ Proposed</p> <p>▬ Existing/Under Construction</p> <p>BLM Routes</p> <p>▬ Motorized</p> <p>▬ Non-motorized</p> <p>▬ Other Designation</p> <p>▬ Technical Rock Crawling Only</p> <p>▬ Undesignated***</p>	<p>WRNF Routes</p> <p>▬ Existing</p> <p>▬ Decommission****</p> <p>* Agriculture = Resource and Resource Limited (35 acre lots and larger) Community Center = Fulford Historical, Commercial General and Limited, Industrial, Residential Multi-Family and Rural Centers Rural Residential = Agricultural Residential (10 acre lots), Agriculture Limited (5 acre lots), Rural Residential (2 acre lots) Suburban Residential = Residential Suburban Low and Medium Density ** Includes Denver Water Board *** Current use continues until route designated **** Planned or completed decommissioning</p>
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Sources: BLM, CDOT, COMaP v10, Eagle County, ECO-Resolutions, ESRI, RMW, USFS, USGS
 Map prepared by RMW 11/2018 17-136



STATE HIGHWAY 82

State Highway 82 is the principal route between Glenwood Springs and Aspen. While only a short section of the highway traverses through Eagle County, this segment bisects mule deer and elk winter range and an elk habitat linkage across SH 82 and the Roaring Fork Valley.

1. SH 82, Emma

Mileposts: 18-23

Objectives: Reduce WVC with deer and provide connectivity for deer, elk and other wildlife across SH 82.

Land Ownership: Private Conservation Lands, Pitkin County Open Space, Private, State Wildlife Area, BLM

Road Type: Four-lane highway

Wildlife Score (Max = 10)	Safety Score* (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
5.3	4	9.3 [Rank 8/16]	7.5	16.8 [Rank 7/22]

*Score based on available WVC crash and carcass datasets and local knowledge.

Primary Target Species	Movement Type	Population Value to Species	WVC Rate
Elk	Migration, winter range	Moderate	Low
Mule Deer	Migration, Winter Range, Resident	High	High
Secondary Target Species			
Black Bear	Local	Low	Low

SH 82 bisects lower elevation winter range for mule deer and elk as it runs through the Roaring Fork Valley. For mule deer, herds that summer in three different mountain ranges converge in the valley for the winter. Historically, migration movements were quite large through

this linkage. While a large number of deer continue to rely on this area, elk numbers are lower, and the Emma Linkage represents a less critical movement area for elk than for mule deer. In addition, black bear and a variety of small mammals are known to cross SH 82, particularly along the riparian corridor. Moose are uncommon here but are expected to expand into this area in the coming years. This segment was also identified as a habitat linkage in the Phase I connectivity assessment.

Much of the wildlife movement across SH 82 occurs between MP 20-21, which is also the stretch with the highest rate of reported WVC accidents and WVC carcass pickups. Around MP 22 CPW has identified highway crossing zones and migration corridors for both mule deer and elk. CPW also identifies MP 17-19 as a highway crossing zone for elk, with less elk movement in the eastern portion of the linkage. While there are several residential developments in this area and habitat quality is generally lower, wildlife is, nonetheless, able to move through adjacent open, grassy fields.

Wildlife exclusion fencing has been constructed along various segments of SH 82 through the Roaring Fork Valley. Wildlife fencing in this segment is intermittent. The fencing is also punctuated by many access drives, most of which have deer guards, but the design of these guards has proved ineffective at keeping deer from entering into the fenced right-of-way.

The landscape along this stretch of SH 82 is a mix of agricultural lands, rural and suburban residential development, and natural vegetation, particularly around the riparian corridor. There are a variety of protected lands in the linkage area including county open space, private conservation lands, conservation easements, the Basalt State Wildlife Area north of SH 82, and BLM lands on Light Hill and Crown Mountain. National Forest lands lie beyond to both the north and south. However, much of the valley floor is in private ownership and future development here threatens to further restrict wildlife

movements. Currently, traffic volumes average 20,000 AADT, including regional and tourist traffic to and from Aspen, as well as local and commuter traffic.

Preliminary Connectivity Recommendations and Opportunities

- Focus wildlife-highway mitigation in locations where lands are protected on either side of the highway to ensure long-term permeability in the face of future development. For example:



Box culvert at MP 22.1

- The existing box culvert at MP 22.1 (~ 8'H x 12'W under 4 lanes) currently receives some use by deer (primarily resident animals) and may also be used by black bear and other medium-sized and small fauna. The structure at this location could be expanded to a low, wide underpass to facilitate greater movements by deer and potentially elk. In the interim, clear some of the high shrubbery at the structure entrances to improve access and visibility. Install wildlife-friendly fence at the south structure entrance, including a section of roll-back fence, so that this opening may be made more accessible when livestock are not present in the adjacent pasture.
- It may be feasible to construct a wildlife overpass east of the box culvert at MP 22.2 where the road is below grade relative to the surrounding landscape. Both sides of the highway are conserved open space or conserved private land at this location. An overpass would need to consider the Emma Trail, which runs parallel to SH 82 to the north. If an overpass were constructed here, then there would be

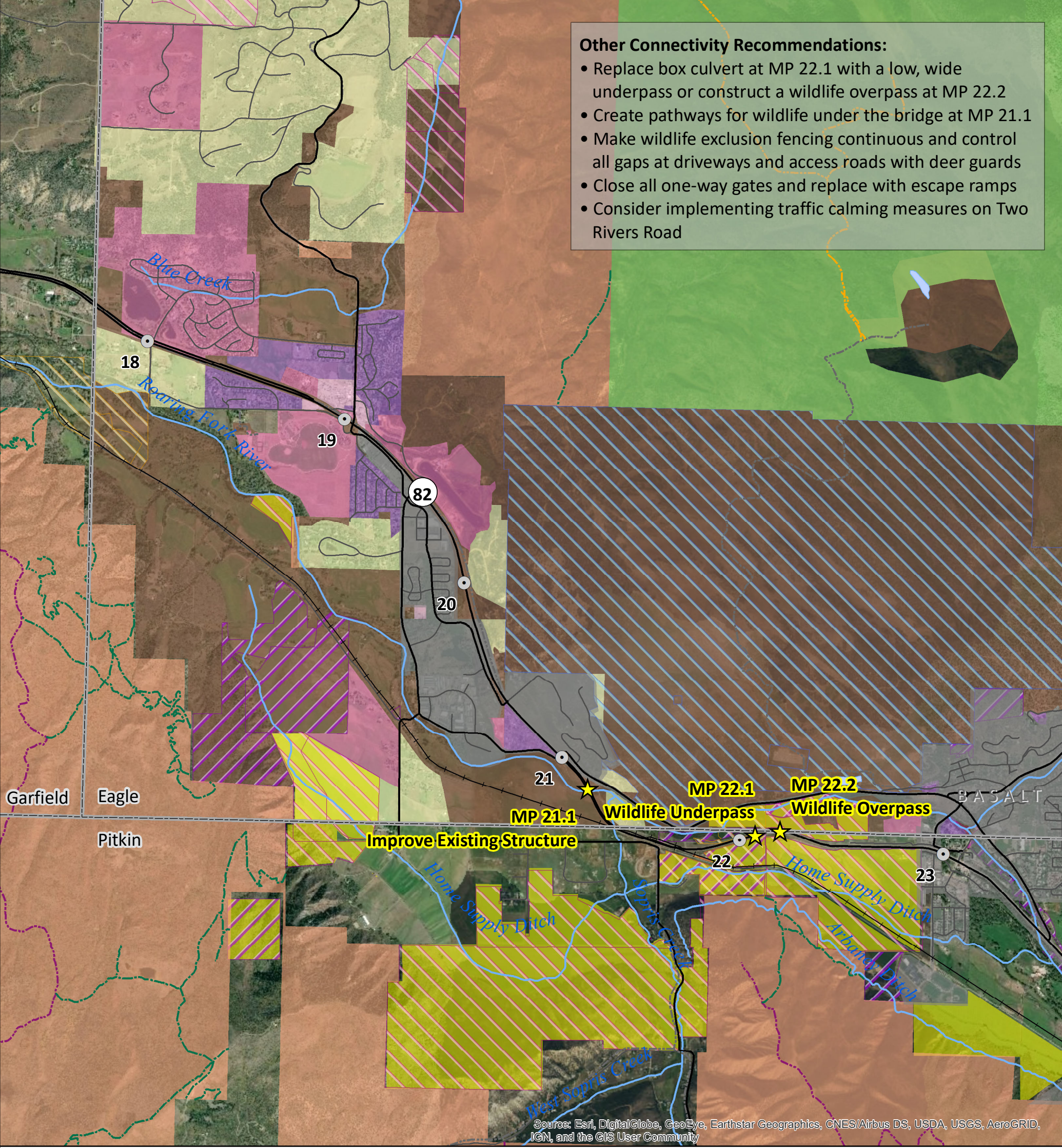
no need to replace the box culvert at MP 22.1, although this structure should be maintained for wildlife passage.

- At MP 21.1, the bridge over the Roaring Fork River has steep, riprap banks down to the river. Remove debris on upstream side of bridge piers and create wildlife paths along the slopes leading into/out of the structure.
- Extend wildlife exclusion fencing so that it is continuous on both sides of the highway through high WVC areas. Consider connecting the existing fence to the bridge over the Roaring Fork River at MP 21.1 to guide wildlife to this structure. Wildlife fence should connect tightly to the edge of structures and deer guards to prevent wildlife incursions into the fenced right-of-way through gaps. Avoid short segments of wildlife fencing or fencing along just one side of the highway to prevent animals from becoming trapped inside the fenced right-of-way.
- Remove and close off one-way deer gates; instead, construct escape ramps to allow wildlife to escape from the fenced right-of-way.
- Remove right-of-way fence and sheep fence or replace with a wildlife friendly alternative in wildlife movement areas.
- Consider implementing traffic calming measures and warning signage on Two Rivers Road, which parallels SH 82 to the north.
- Future proposed elk collaring by CPW would bring new insights to our understanding of elk activity and movements. Collars programmed to take data points at short time intervals are particularly useful for determining movement patterns (e.g., every 2 hours during fall, winter and spring, and every 5 hours in summer).



Riprap bank under bridge at MP 21.1

- Other Connectivity Recommendations:**
- Replace box culvert at MP 22.1 with a low, wide underpass or construct a wildlife overpass at MP 22.2
 - Create pathways for wildlife under the bridge at MP 21.1
 - Make wildlife exclusion fencing continuous and control all gaps at driveways and access roads with deer guards
 - Close all one-way gates and replace with escape ramps
 - Consider implementing traffic calming measures on Two Rivers Road



SH82 Emma (MP 18-23)

★ Recommended Wildlife Crossings	Current Conservation Easements	Wilderness	WRNF Routes
● Milepoints	Pitkin County Open Space and Trails	Recommended Wilderness	----- Existing
—+— Rio Grande Trail	Potential Development	BLM Routes	----- Decommission****
Zoning (Non-Public)*	Land Manager	----- Motorized	
■ Agricultural	■ BLM	----- Non-motorized	* Agriculture = Resource and Resource Limited (35 acre lots and larger)
■ Community Center	■ State	----- Other Designation	Community Center = Fulford Historical, Commercial General and Limited, Industrial, Residential Multi-Family and Rural Centers
■ Planned Unit Development	■ NGO/Land Trust**	----- Technical Rock Crawling Only	Rural Residential = Agricultural Residential (10 acre lots), Agriculture Limited (5 acre lots), Rural Residential (2 acre lots)
■ Rural Residential	■ Private Conservation	----- Undesignated***	Suburban Residential = Residential Suburban Low and Medium Density
■ Suburban Residential	■ USFS		** Includes Denver Water Board
■ Town Boundary			*** Current use continues until route designated

0 0.5 1 Miles

Sources: BLM, CDOT, COMaP v10, Eagle County, ECO-Resolutions, ESRI, Pitkin County, RMW, USFS, USGS
Map prepared by RMW 11/2018 17-136

**** Planned or completed decommissioning

STATE HIGHWAY 131

State Highway 131 runs north from I-70/Wolcott to US 40. From State Bridge north, the highway runs parallel to the Colorado River and the railroad. The railroad line is open to both passenger and freight traffic. The highway serves as the only alternate route around Glenwood Canyon when I-70 is closed, and is subject to heavy traffic increases during these times. Much of the roadway from I-70 to the Routt County line is identified as elk and mule deer winter or severe winter range, and was identified as habitat linkages for elk and mule deer in the Phase I connectivity assessment.

1. SH 131, Wolcott to State Bridge

Mileposts: 1-14

Objectives: Reduce WVC and protect historical east-west migration for deer; maintain connectivity for deer, elk and other wildlife

Land Ownership: BLM, Denver Water Board, Private

Road Type: Two-lane highway

Wildlife Score (Max = 10)	Safety Score* (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
8.7	5	13.7 [Rank 1/16]	7	20.7 [Rank 1/22]

*Score based on available WVC crash and carcass datasets and CPW knowledge.

Primary Target Species	Movement Type	Population Value to Species	WVC Rate
Canada Lynx	Potential dispersal	Low	Low
Elk	Migration, winter range	High	Low
Mule Deer	Migration, winter range	High	High
Secondary Target Species			
Greater Sage Grouse	Local	Low	Low
Moose	Local	Low	Low
Mountain Lion	Regional	Low	Low
Pronghorn	Local	Low	Low
Sharp-tailed Grouse	Local	Low	Low

From I-70 north to roughly MP 3, SH 131 bisects a major east-west migration corridor along the north side of the Eagle River Valley from Vail Pass to Dotsero. Historically, this was Colorado’s second largest mule deer migration and, while much reduced, it remains an important migration route. The segment between MP 1.5-3 is a critical bottleneck for migrating elk and mule deer and was also identified as a primary habitat linkage in the Phase I connectivity assessment. CPW wildlife managers have identified the entire segment from I-70 north to State Bridge as a high value linkage due to the lack of development and excellent habitat conditions. Lynx dispersal movements are likely through the BLM-identified Castle Peak lynx linkage, which crosses SH 131 between MP 1-5.

The landscape through this linkage is characterized as natural sage brush and agricultural fields with riparian corridors that are bisected by or run parallel to the highway. While there are several low-density subdivisions, human development and activity through this linkage is relatively light, allowing for continuous wildlife habitat and large populations of deer and elk. WVC are reported throughout the segment. WVC accidents spike between MP 7-8, where it is noted that high traffic speeds coincide with a blind spot where wildlife are known to cross. These collisions may result in more accidents reported to law enforcement; however, the highest number of carcass pickups are

reported between MP 0-3, through the mule deer migration corridor, and MP 11, where high quality winter range is bisected by a segment of highway where high traffic speeds are common. Current traffic volumes are moderate at 3,600 AADT but increase when I-70 through Glenwood Canyon is closed. When such a closure coincides with ungulate migration, higher WVC rates are likely.

Much of the linkage area from MP 1-8 is owned by the BLM or Denver Water Board. Between MP 7-11 is largely in private ownership. The Denver Water Board has developed a proposal to construct a 300,000-acre-foot reservoir on either side of SH 131, which would pose a critical threat to the mule deer migration and other wildlife movements and require a new highway alignment. Construction of the reservoir would also be expected to lead to major increases in human activity including development and recreation activities and associated traffic. Regardless, recreation activity is expected to increase in this area with potential impacts to wildlife populations and wildlife movement. These include motorized recreation, outfitters and a zip line.

Widening on SH 131 is not in CDOT's long range (20 year) plan. However, potential increases commercial, residential and recreation development around Wolcott would be expected to increase the development pressure along SH 131 with subsequent increases in traffic volume. Regardless, residential development is expected to increase between I-70 and Steamboat Springs.

North of this linkage (State Bridge to McCoy, MP 14-20), local wildlife movements across SH 131 are common, particularly where deer and elk are moving between sage habitat and agricultural fields along the Colorado River. A concern in this area is the conversion from traditional agricultural production to hemp, which has little wildlife value. Other threats to wildlife here include the railroad, which causes a number of wildlife mortalities, and the potential paving of Trough Road from State Bridge to Kremmling, which would increase fragmentation in that area.

Preliminary Connectivity Recommendations and Opportunities

- Remove right-of-way fence or, where necessary, replace with wildlife friendly alternatives, particularly in the southern half of the linkage area. Encourage the use of wildlife friendly cattle fence over sheep fence alternatives, except where such fencing is required.
- Work with major private land owners to proactively develop a vision for preserving wildlife habitat and movement across private lands.
- Coordinate with CPW biologists, CDOT engineers and others to identify multiple locations for wildlife crossing structures (underpasses and overpasses) throughout this segment to accommodate the mule deer and elk migration as well as other wildlife movements, particularly between MP 1-3 and MP 11-13.

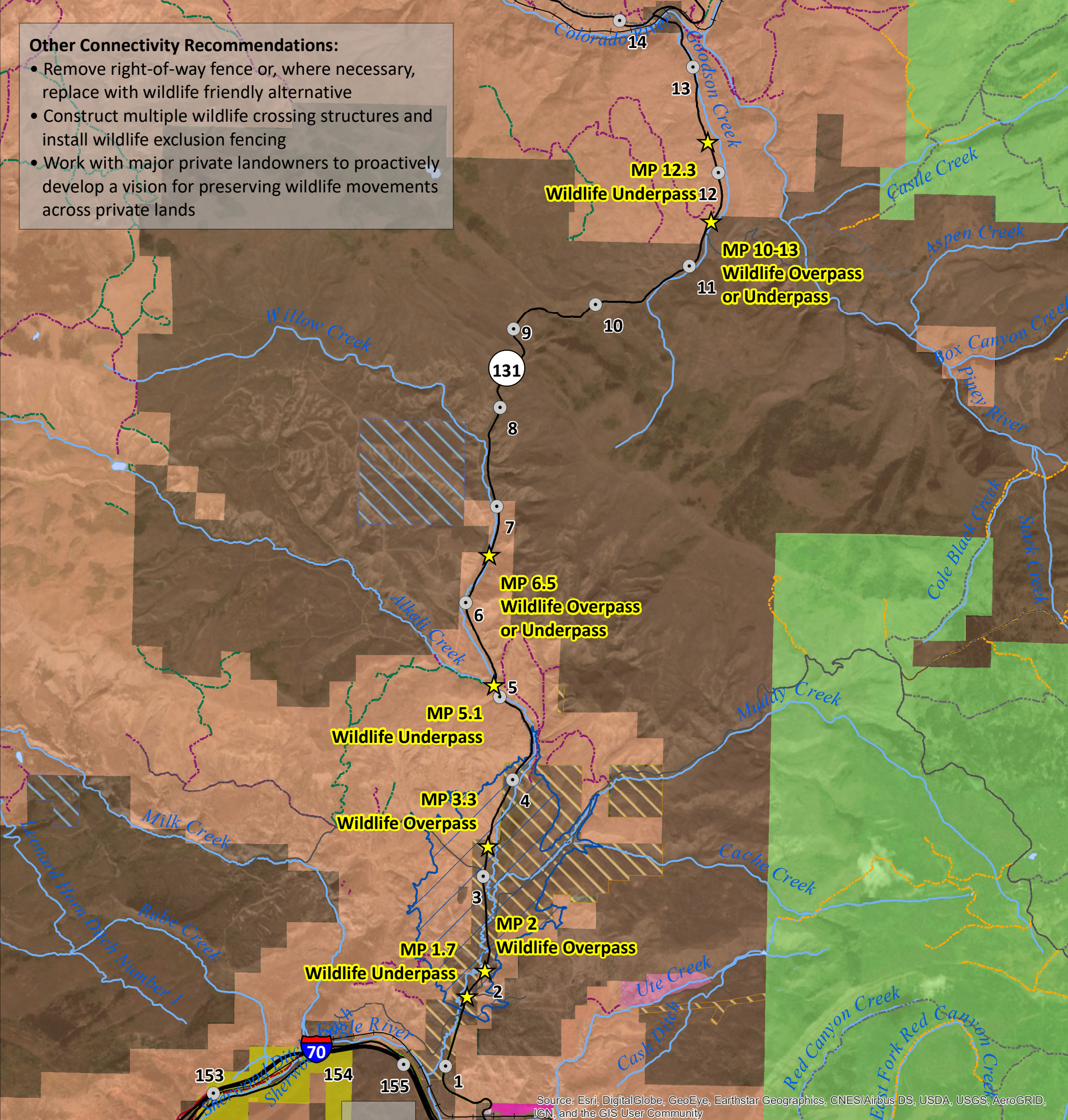
Possible locations include:

- MP 1.7 – potential underpass location in fill slope.
- MP 2.0 – potential overpass location at road cut.
- MP 3.3 – potential overpass location; BLM lands on both sides of highway.
- MP 6-7 – river, wetland attract wildlife through this segment and result in many deer movements across the highway; however, terrain constraints make wildlife crossings mitigation difficult. Coordinate with CDOT to identify mitigation options.
- MP 5.1 – Alkali Creek Crossing. Replace existing culvert with a larger wildlife crossing structure.
- MP 12.3 – potential bridge underpass location at large fill.
- Various under- or overpass opportunities between MP 10-13.

- In the event that Denver Water’s reservoir proposal advances, require highway mitigation and other conservation actions in conjunction with a new highway alignment.
- Engage Eagle Valley Ranch in outreach efforts to educate visitors and the public about the need for wildlife connectivity on SH 131 and elsewhere.

Other Connectivity Recommendations:

- Remove right-of-way fence or, where necessary, replace with wildlife friendly alternative
- Construct multiple wildlife crossing structures and install wildlife exclusion fencing
- Work with major private landowners to proactively develop a vision for preserving wildlife movements across private lands



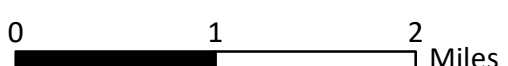
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

SH131 Wolcott to State Bridge (MP 1-14)

<p>★ Recommended Wildlife Crossings</p> <p>● Milepoints</p> <p>—+— Railways</p> <p>▭ Proposed Reservoir</p> <p>Zoning (Non-Public)*</p> <p>■ Agricultural</p> <p>■ Community Center</p> <p>■ Planned Unit Development</p> <p>■ Rural Residential</p> <p>■ Suburban Residential</p> <p>■ Town Boundary</p>	<p>■ Current Conservation Easements</p> <p>■ Potential Development</p> <p>■ Wilderness</p> <p>■ Recommended Wilderness</p> <p>Land Manager</p> <p>■ BLM</p> <p>▨ State</p> <p>▨ NGO/Land Trust**</p> <p>▨ Private Conservation</p> <p>■ USFS</p>	<p>Eagle Valley Regional Trail System</p> <p>— Proposed</p> <p>— Existing/Under Construction</p> <p>BLM Routes</p> <p>— Motorized</p> <p>— Non-motorized</p> <p>— Other Designation</p> <p>— Technical Rock Crawling Only</p> <p>— Undesignated***</p>	<p>WRNF Routes</p> <p>— Existing</p> <p>— Decommission****</p>
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* Agriculture = Resource and Resource Limited (35 acre lots and larger)
 Community Center = Fulford Historical, Commercial General and Limited, Industrial, Residential Multi-Family and Rural Centers
 Rural Residential = Agricultural Residential (10 acre lots), Agriculture Limited (5 acre lots), Rural Residential (2 acre lots)
 Suburban Residential = Residential Suburban Low and Medium Density
 ** Includes Denver Water Board
 *** Current use continues until route designated
 **** Planned or completed decommissioning

Sources: BLM, CDOT, COMaP v10, Eagle County, ECO-Resolutions, ESRI, RMW, USFS, USGS
 Map prepared by RMW 11/2018 17-136



2. SH 131, Antelope Road

Mileposts: 20-22

Objectives: Reduce WVC and maintain connectivity for deer and elk

Land Ownership: BLM, Private, State Land Board

Road Type: Two-lane highway

Wildlife Score (Max = 10)	Safety Score (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
4.7	1	5.7 [Rank 14/16]	5	10.7 [Rank 19/22]

**Score based on available WVC crash and carcass datasets and CPW knowledge.*

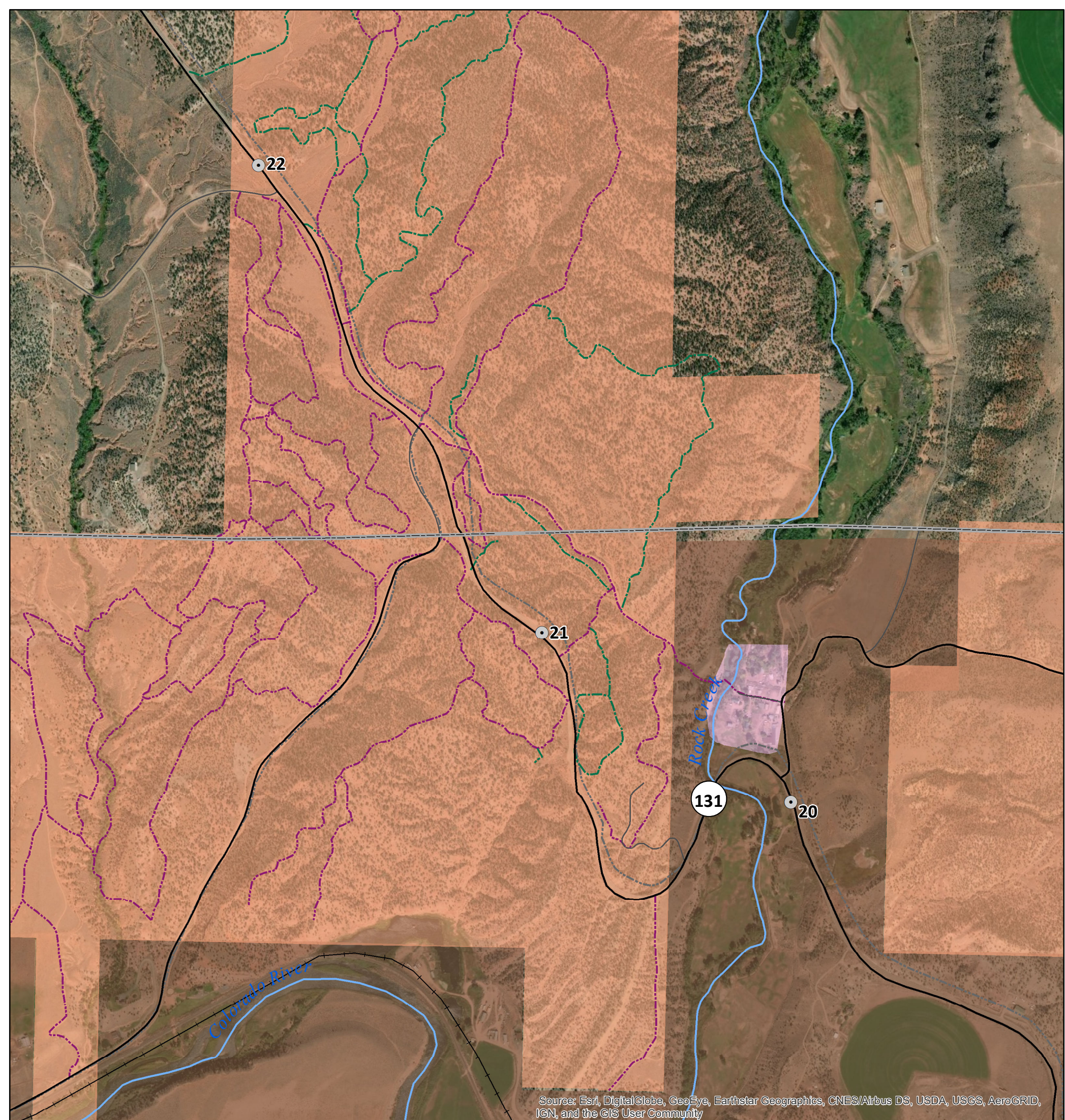
Primary Target Species	Movement Type	Population Value to Species	WVC Rate
Elk	Migration, winter range	Moderate	Low
Mule Deer	Migration, winter range	High	Moderate

This linkage area is characterized by continuous, high quality habitat and large blocks of federal land on either side of the highway. There is little development threat due to the presence of public lands. While WVC are currently low through this segment, increases in traffic volume and increased human development or an increase in hemp production to the south could increase the significance of this linkage for deer and elk. There is an existing bridge over Rock Creek north of McCoy; however, this structure is not conducive to deer and elk passage.

Preliminary Connectivity Recommendations and Opportunities

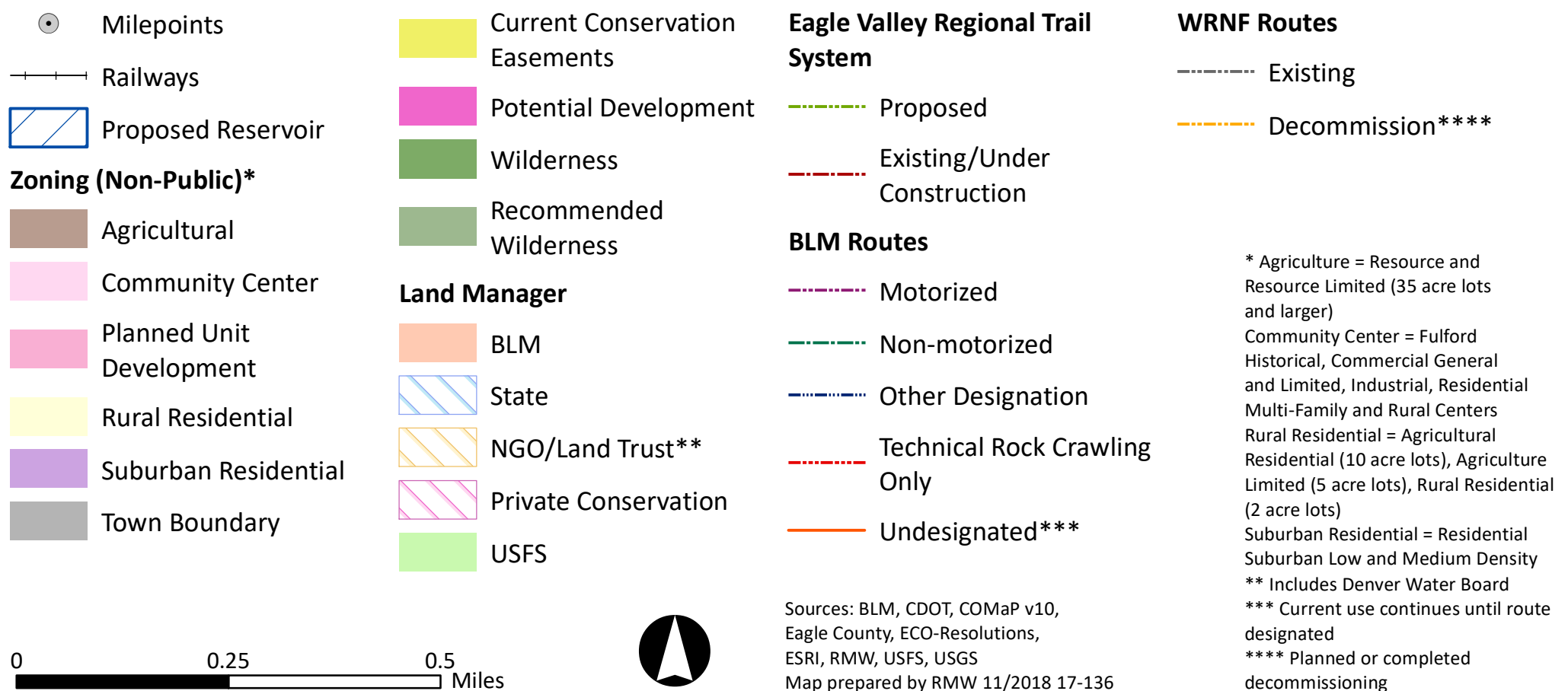
- Identify the best locations for one or more wildlife crossing structures (e.g., MP 20.3-21) to facilitate mule deer and elk movements.

- Remove right-of-way fence or replace with a wildlife friendly alternative in wildlife movement areas, where needed.
- Coordinate with BLM to minimize motorized and non-motorized recreation impacts, particularly with regards to potential wildlife crossing structures.
- Determine opportunities for Habitat Partnership Program on private ranch lands to encourage crop diversification and wildlife-compatible farming.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

SH131 Antelope Road (MP 20-22)



GYPSUM CREEK ROAD

1. Gypsum Creek Road, Cottonwood Pass

Road to L.E.D.E. Reservoir

Mileposts: 2-22

Objectives: Maintain connectivity for deer, elk and other wildlife

Land Ownership: Forest Service, Private, BLM

Road Type: Two-lane county road

Wildlife Score (Max = 10)	Safety Score* (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
6.7	1	7.7 [Rank 11/16]	5.5	13.2 [Rank 13/22]

*Score based on local knowledge; WVC data are not available for county roads.

Primary Target Species	Movement Type	Population Value to Species	WVC Rate
Elk	Migration	High	Low
Mule Deer	Migration; resident; winter seasonal	High	Low
Secondary Target Species			
Bighorn Sheep	Incidental movement at southern extent (from Basalt)	Low	Low

Gypsum Creek Road traverses through a rural, agricultural landscapes on the outskirts of Gypsum, and transitions to forested mountain landscape as the road parallels Gypsum Creek to the upper portions of the watershed. Around MP 5 the road changes from paved to dirt road and, continuing further up the drainage, the road quality diminishes above MP 14. The rural and natural character of the landscape combined with a low traffic volume and low speed roadway means that this area is permeable to wildlife movement. During the winter, the road closes above MP 16.

CPW identifies an elk production area along the north-facing slopes of the Gypsum Creek drainage. The south-facing slopes of the drainage and flat open lands of the lower valley are elk winter range, while the upper portions of the drainage provide summer range for both deer and elk. Wildlife movements are dispersed and there are currently no bottlenecks or pinch-points. WVC are generally low, but may occur when motorists are driving fast and wildlife are present.

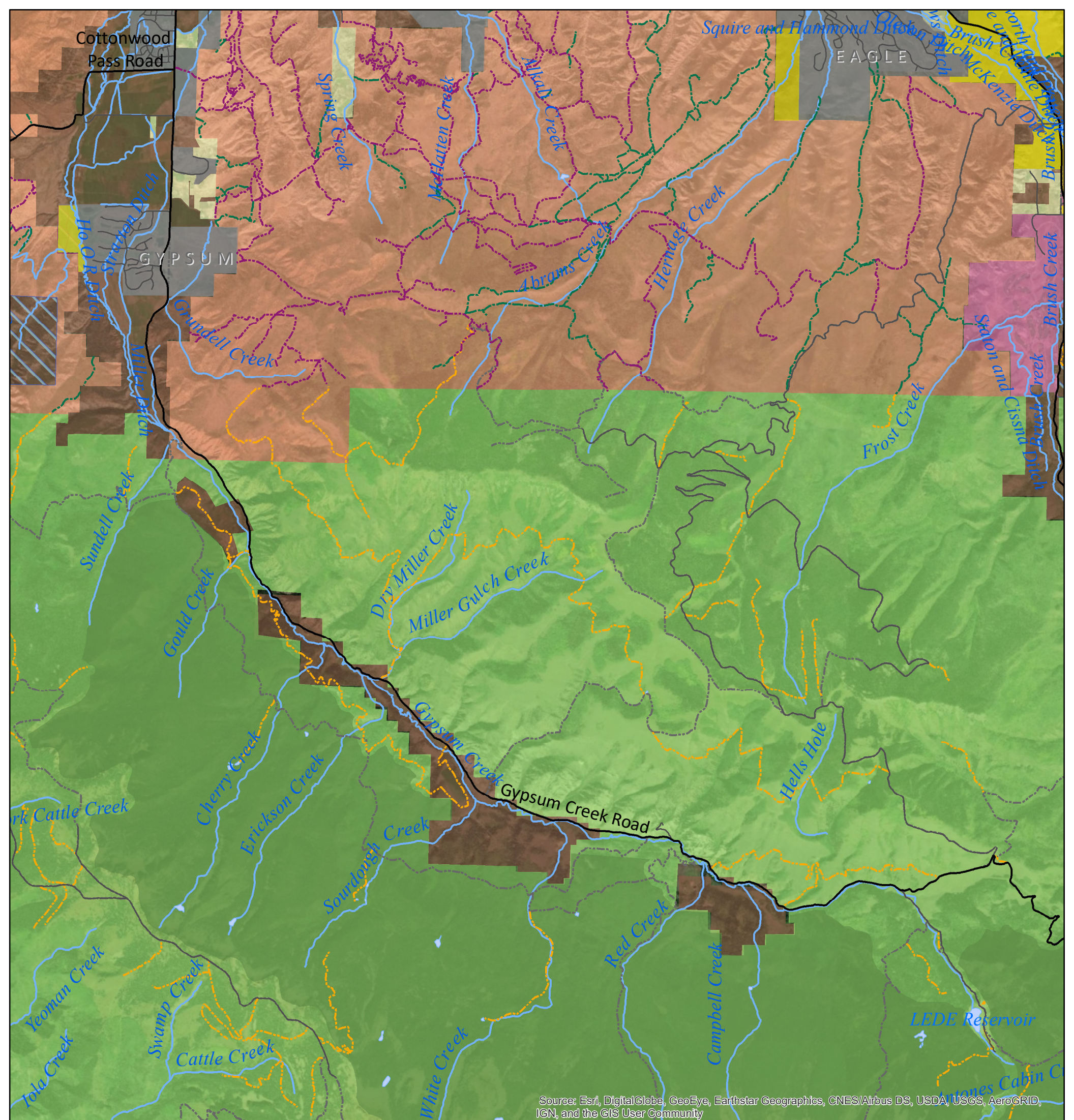


Wetlands along Gypsum Creek Road

At the upper end of the drainage is L.E.D.E. Reservoir, which is managed as a dispersed recreation area. The Forest Service is hardening the campgrounds around the reservoir, and dispersed camping occurs along the road and the creek below the reservoir.

Preliminary Connectivity Recommendations and Opportunities

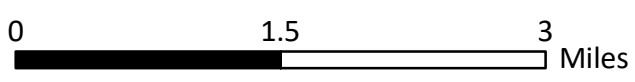
- Maintain the natural, rural character of this landscape to preserve wildlife habitat and wildlife movement patterns across Gypsum Creek Road. Conservation efforts such as the ones Eagle Valley Land Trust is currently pursuing in the lower portions of the valley, between MP 2-6 are important to this effort.
- Manage recreation levels and activities to avoid impacts to wildlife.



Gypsum Creek Road - Cottonwood Pass Road to L.E.D.E. Reservoir (MP 2-22)

<ul style="list-style-type: none"> ● Milepoints —+— Railways ▭ Proposed Reservoir <p>Zoning (Non-Public)*</p> <ul style="list-style-type: none"> ▭ Agricultural ▭ Community Center ▭ Planned Unit Development ▭ Rural Residential ▭ Suburban Residential ▭ Town Boundary 	<ul style="list-style-type: none"> ▭ Current Conservation Easements ▭ Potential Development ▭ Wilderness ▭ Recommended Wilderness <p>Land Manager</p> <ul style="list-style-type: none"> ▭ BLM ▭ State ▭ NGO/Land Trust** ▭ Private Conservation ▭ USFS 	<p>Eagle Valley Regional Trail System</p> <ul style="list-style-type: none"> — Proposed — Existing/Under Construction <p>BLM Routes</p> <ul style="list-style-type: none"> — Motorized — Non-motorized — Other Designation — Technical Rock Crawling Only — Undesignated*** 	<p>WRNF Routes</p> <ul style="list-style-type: none"> — Existing — Decommission****
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 Suburban Residential = Residential Suburban Low and Medium Density
 ** Includes Denver Water Board
 *** Current use continues until route designated
 **** Planned or completed decommissioning



Sources: BLM, CDOT, COMaP v10, Eagle County, ECO-Resolutions, ESRI, RMW, USFS, USGS
 Map prepared by RMW 11/2018 17-136

BRUSH CREEK ROAD

Brush Creek Road is a county road that runs south from the Town of Eagle to Pitkin County. Moving south from Eagle, the landscape transitions from suburban residential to agricultural and low density residential to forested natural habitat. Beyond Sylvan Lake State Park, Brush Creek Road is largely an unimproved road through higher elevation forests. This segment of road runs through deer and elk summer range and is permeable to wildlife movement. It is closed during the winter.

1. Brush Creek Road, Hardscrabble Ranch Mileposts: 3.5-6

Objectives: Maintain connectivity for deer, elk and other wildlife

Land Ownership: Private conservation easement, BLM, Private

Road Type: Two-lane county road

Wildlife Score (Max = 10)	Safety Score* (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
6	1	7 [Rank 12/16]	5	12 [Rank 16/22]

*Score based on local knowledge; WVC data are not available for county roads.

Primary Target Species	Movement Type	Population Value to Species	WVC Rate
Elk	Migration, winter range	High	Low
Mule Deer	Migration, winter range	Moderate	Low

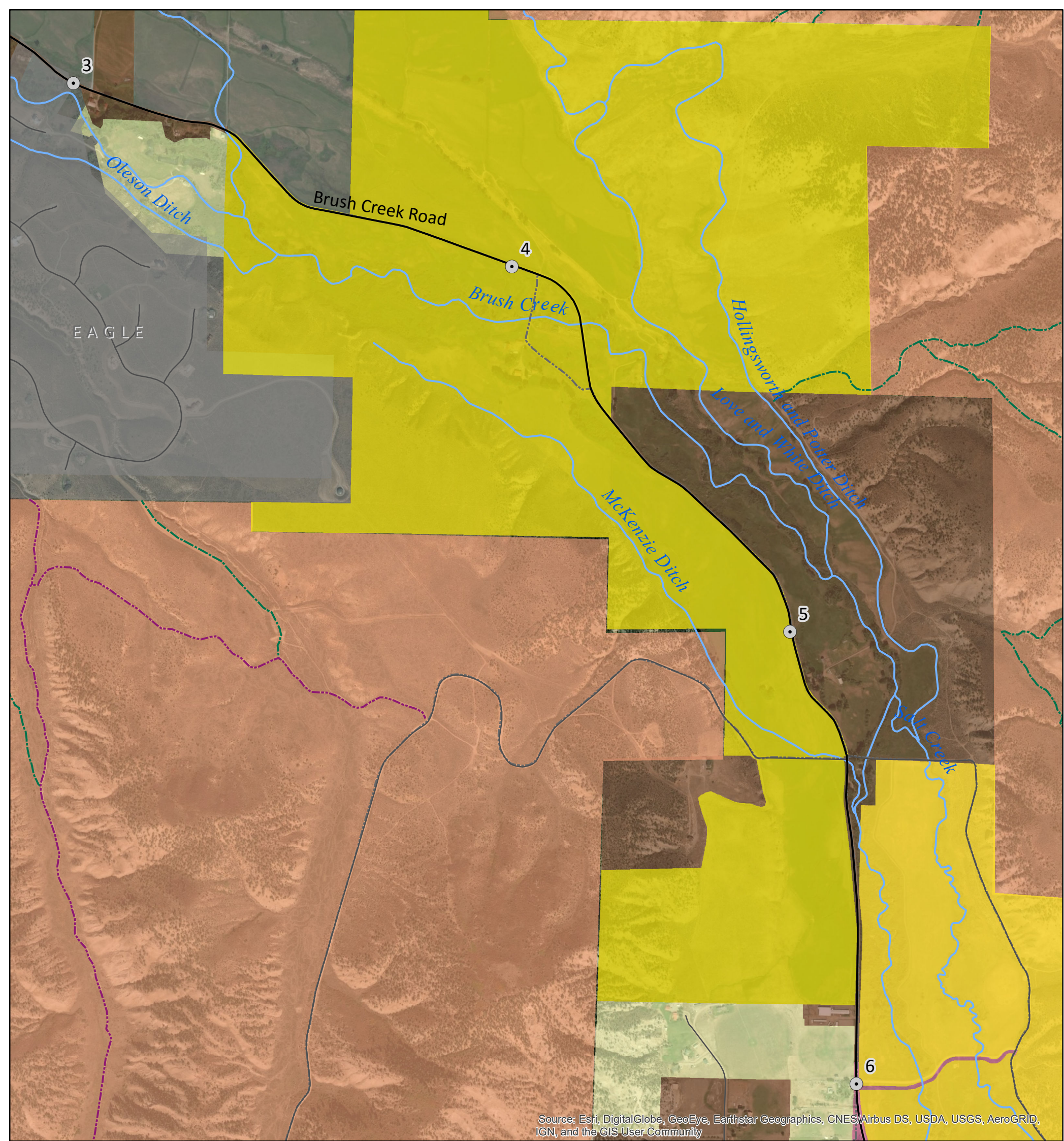
The lower Brush Creek Valley is critical for elk migration and winter range, and also provides habitat for mule deer and other wildlife. Much of the historical elk winter range at the bottom of Abrams and Hernage Creeks is now the Eagle Ranch development and golf course. While

wintering elk still occur around the golf course and residential yards, traditional movement patterns shifted to avoid human disturbance and recreation. Extensive motorized and non-motorized trails in the surrounding BLM lands further concentrate wildlife seeking to avoid these impacts. As a result of these land use changes and shifting wildlife movement patterns, the remaining open spaces have become increasingly important for migratory elk and deer that winter in this lower elevation valley. Hardscrabble Ranch lies on either side of Brush Creek Road roughly between MP 4-6, and was purchased by Eagle County in 2017, protecting 1,540 acres of open space along Brush Creek sandwiched between the developments of Eagle Ranch and Frost Creek.

Wildlife movements across Brush Creek Road are common during the winter months, but incidence of WVC remain low. However, future increases in traffic volumes and further shifts in wildlife movement patterns may lead to an increase in WVC. At MP 4, Brush Creek crosses under the road, but the existing bridge structure is not suitable for elk or deer passage. The flat landscape context of the roadway does not lend itself to any natural wildlife crossing locations.

Preliminary Connectivity Recommendations and Opportunities

- Replace barbed wire fence with wildlife-friendly fence (smooth wire with high bottom wire) to prevent fawns and calves from getting trapped on the road and to increase permeability in general.
- Avoid new recreation trails in key wildlife areas.
- Place seasonal closures on new and existing recreation trails to preserve habitat quality for wintering elk and mule deer.

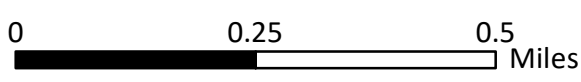


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Brush Creek Road - Hardscrabble Ranch (MP 3.5-6)

- Milepoints
- +— Railways
- ▭ Proposed Reservoir
- Zoning (Non-Public)***
- Agricultural
- Community Center
- Planned Unit Development
- Rural Residential
- Suburban Residential
- Town Boundary
- Current Conservation Easements
- Potential Development
- Wilderness
- Recommended Wilderness
- Land Manager**
- BLM
- ▨ State
- ▨ NGO/Land Trust**
- ▨ Private Conservation
- USFS
- Eagle Valley Regional Trail System**
- Proposed
- Existing/Under Construction
- BLM Routes**
- Motorized
- Non-motorized
- Other Designation
- Technical Rock Crawling Only
- Undesignated***
- WRNF Routes**
- Existing
- Decommission****

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 Suburban Residential = Residential Suburban Low and Medium Density
 ** Includes Denver Water Board
 *** Current use continues until route designated
 **** Planned or completed decommissioning



Sources: BLM, CDOT, COMaP v10, Eagle County, ECO-Resolutions, ESRI, RMW, USFS, USGS
 Map prepared by RMW 11/2018 17-136

2. Brush Creek Road, Frost Creek

Mileposts: 8-12

Objectives: Maintain connectivity for deer, elk and other wildlife

Land Ownership: Private, National Forest, State Park, State Land Board, BLM

Road Type: Two-lane county road

Wildlife Score (Max = 10)	Safety Score* (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
4	1	5 [Rank 12/16]	5	10 [Rank 20/22]

*Score based on local knowledge; WVC data are not available for county roads.

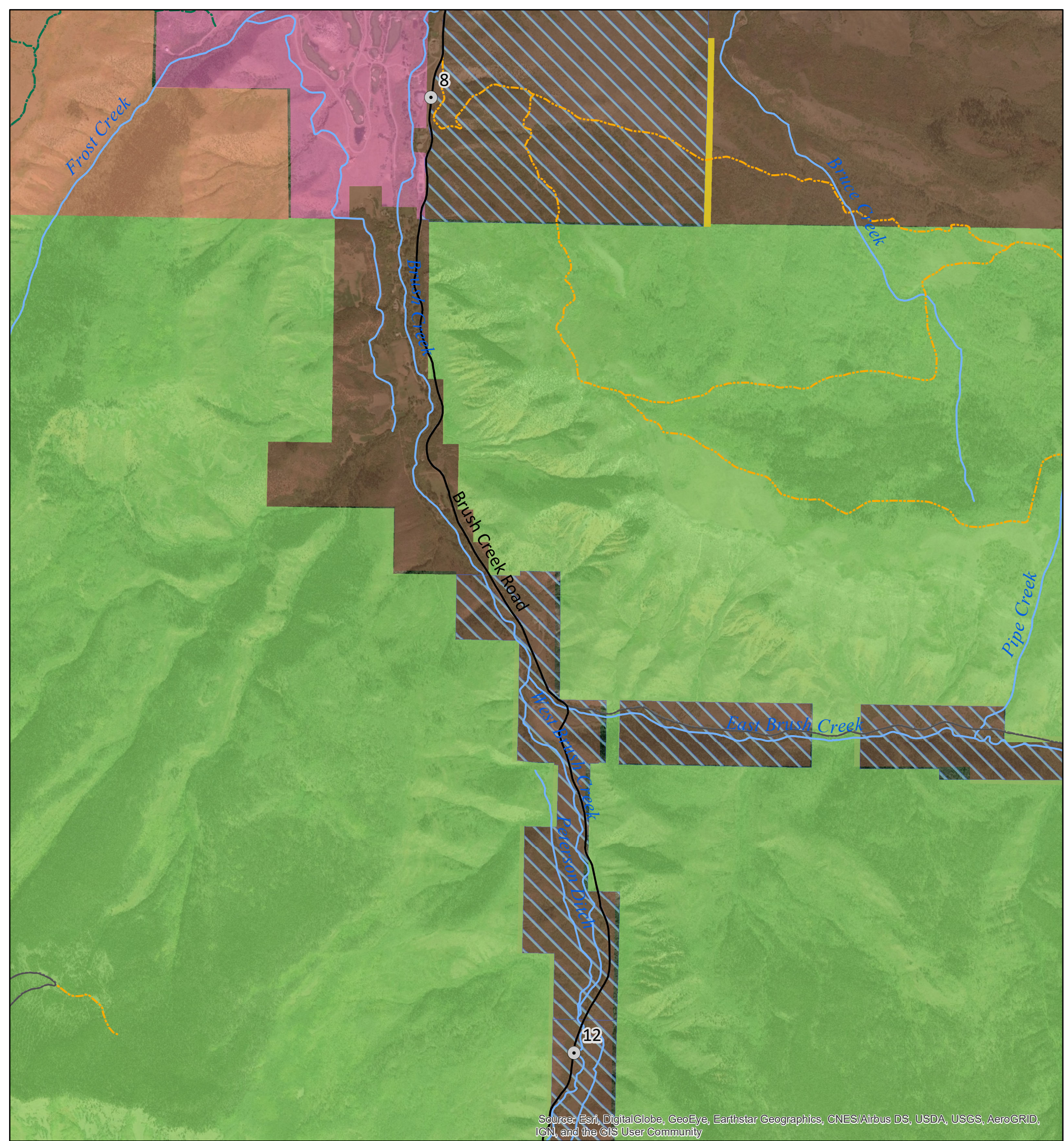
Primary Target Species	Movement Type	Population Value to Species	WVC Rate
Elk	Migration, winter range	Moderate	Low
Mule Deer	Migration, winter range	Moderate	Low

This linkage area extends from the Frost Creek development to Sylvan Lake State Park. The landscape is characterized as low density residential with a golf course to the north. South of the Frost Creek development are rural ranch lands along the Brush Creek drainage. CPW identifies this segment of Brush Creek Road as a mule deer crossing zone and winter range. To the east and west are public lands, including the White River National Forest, a State Land Board parcel, and BLM lands. The entrance to Sylvan Lake State Park is located at MP 10 and includes the West Brush Creek and East Brush Creek drainages.

Overall, the threat of residential development is much lower here than to the north, but ongoing development and recreation will continue to impact wildlife movement through the linkage. This segment of Brush Creek Road is curvy and narrow, keeping traffic speeds lower and WVC infrequent.

Preliminary Connectivity Recommendations and Opportunities

- Maintain agricultural zoning on private lands.
- Replace barbed wire fence with wildlife-friendly fence (smooth wire with high bottom wire) to prevent fawns and calves from getting trapped on the road and to increase permeability in general.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Brush Creek Road - Frost Creek (MP 8-12)

<ul style="list-style-type: none"> ● Milepoints —+— Railways Proposed Reservoir <p>Zoning (Non-Public)*</p> <ul style="list-style-type: none"> Agricultural Community Center Planned Unit Development Rural Residential Suburban Residential Town Boundary 	<ul style="list-style-type: none"> Current Conservation Easements Potential Development Wilderness Recommended Wilderness <p>Land Manager</p> <ul style="list-style-type: none"> BLM State NGO/Land Trust** Private Conservation USFS 	<p>Eagle Valley Regional Trail System</p> <ul style="list-style-type: none"> Proposed Existing/Under Construction <p>BLM Routes</p> <ul style="list-style-type: none"> Motorized Non-motorized Other Designation Technical Rock Crawling Only Undesignated*** 	<p>WRNF Routes</p> <ul style="list-style-type: none"> Existing Decommission**** <p>* Agriculture = Resource and Resource Limited (35 acre lots and larger) Community Center = Fulford Historical, Commercial General and Limited, Industrial, Residential Multi-Family and Rural Centers Rural Residential = Agricultural Residential (10 acre lots), Agriculture Limited (5 acre lots), Rural Residential (2 acre lots) Suburban Residential = Residential Suburban Low and Medium Density ** Includes Denver Water Board *** Current use continues until route designated **** Planned or completed decommissioning</p>
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0 0.5 1 Miles



Sources: BLM, CDOT, COMaP v10, Eagle County, ECO-Resolutions, ESRI, RMW, USFS, USGS
 Map prepared by RMW 11/2018 17-136

COLORADO RIVER ROAD

Colorado River Road is a small road that winds its way alongside the Colorado River from Dotsero to SH 131 north of State Bridge.

1. Colorado River Road, Red Dirt

Mileposts: 14-23

Objectives: Maintain connectivity for bighorn sheep, deer, elk and other wildlife

Land Ownership: BLM, Limited Private

Road Type: Two-lane county road

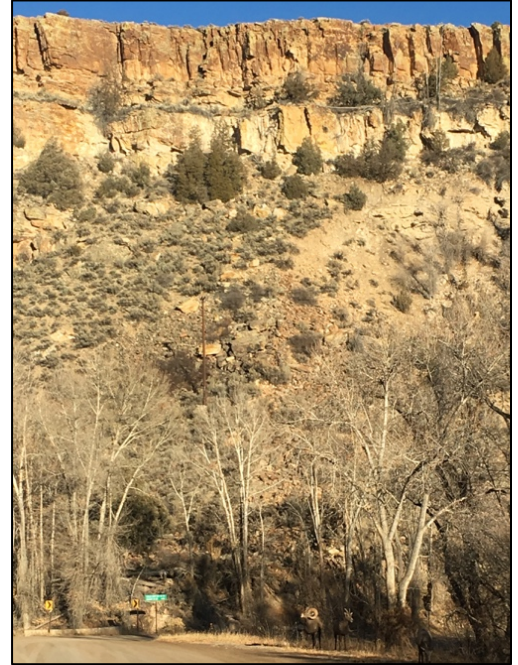
Wildlife Score (Max = 10)	Safety Score* (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
6	1	7 [Rank 12/16]	5.5	12.5 [Rank 15/22]

*Score based on local knowledge; WVC data are not available for county roads.

Primary Target Species	Movement Type	Population Value to Species	WVC Rate
Bighorn Sheep	Local	Very High	Low
Elk	Migration, winter range	Low	Low
Mule Deer	Migration, winter range	Low	Low
Secondary Target Species			
Moose		Low	Low

The Red Dirt segment extends from Red Dirt Creek (MP 14) to Cabin Creek (MP 23) through a narrow canyon carved by the Colorado River. The landscape is mostly natural with a few areas of agricultural activity. The BLM's Bull Gulch Wilderness Study Area comprises much of the land south of the river. Rural development is concentrated toward the north end of this segment around the small town of Burns.

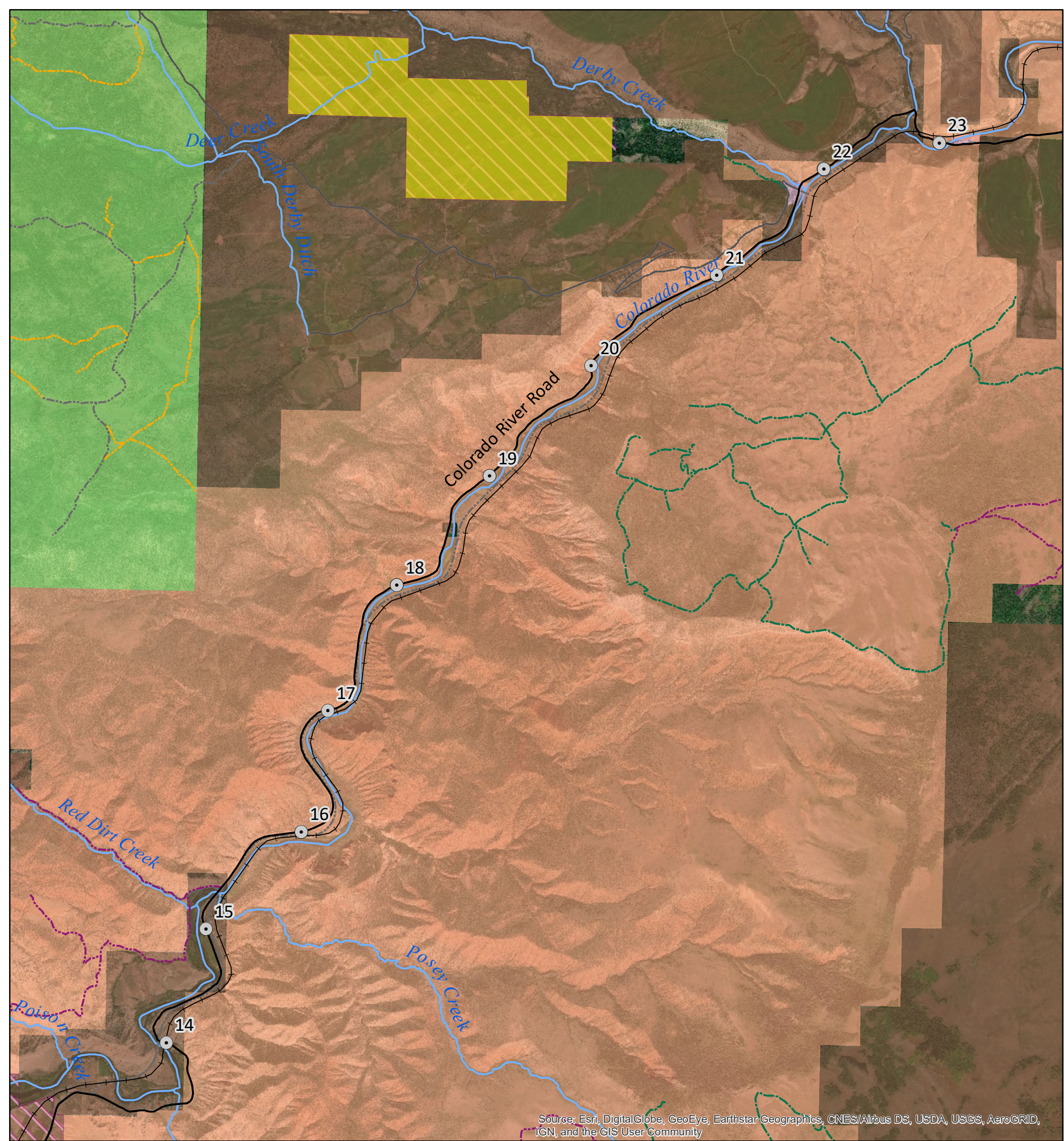
Mule deer and elk movements in this area are mostly seasonal during winter. Bighorn sheep are common in this area, numbering around 80 animals split into 2 or 3 groups. While most bighorn sheep movements are along the south side of the Colorado River, the Cabin Creek drainage is an established north-south migration corridor for bighorn sheep. Moose are also present along the Colorado River. WVC collisions are low for all species and when they do occur are largely related to train rather than road traffic. The greatest threats to wildlife movement are due to the development and subdividing of private ranches, and increasing recreation, including river access, trails and special events.



Small group of bighorn sheep along the roadside at Burns.

Preliminary Connectivity Recommendations and Opportunities

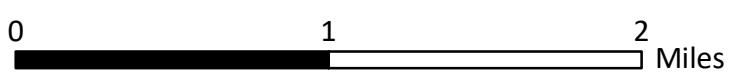
- Maintain the natural, rural character of this landscape to preserve wildlife habitat and wildlife movement patterns across Colorado River Road.
- Manage recreation levels and activities to avoid impacts to wildlife.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Colorado River Road - Red Dirt (MP 14-23)

<ul style="list-style-type: none"> ● Milepoints —+— Railways ▭ Proposed Reservoir <p>Zoning (Non-Public)*</p> <ul style="list-style-type: none"> ■ Agricultural ■ Community Center ■ Planned Unit Development ■ Rural Residential ■ Suburban Residential ■ Town Boundary 	<ul style="list-style-type: none"> ▨ Current Conservation Easements ■ Potential Development ■ Wilderness ■ Recommended Wilderness <p>Land Manager</p> <ul style="list-style-type: none"> ■ BLM ▨ State ▨ NGO/Land Trust** ▨ Private Conservation ■ USFS 	<p>Eagle Valley Regional Trail System</p> <ul style="list-style-type: none"> — Proposed — Existing/Under Construction <p>BLM Routes</p> <ul style="list-style-type: none"> — Motorized — Non-motorized — Other Designation — Technical Rock Crawling Only — Undesignated*** 	<p>WRNF Routes</p> <ul style="list-style-type: none"> — Existing — Decommission**** <p>* Agriculture = Resource and Resource Limited (35 acre lots and larger) Community Center = Fulford Historical, Commercial General and Limited, Industrial, Residential Multi-Family and Rural Centers Rural Residential = Agricultural Residential (10 acre lots), Agriculture Limited (5 acre lots), Rural Residential (2 acre lots) Suburban Residential = Residential Suburban Low and Medium Density ** Includes Denver Water Board *** Current use continues until route designated **** Planned or completed decommissioning</p>
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Sources: BLM, CDOT, COMaP v10, Eagle County, ECO-Resolutions, ESRI, RMW, USFS, USGS
 Map prepared by RMW 11/2018 17-136

2. Colorado River Road, Sweetwater

Mileposts: 1-14

Objectives: Maintain connectivity for deer, elk and other wildlife

Land Ownership: BLM, Private, Private Conservation Easement, Eagle County Open Space

Road Type: Two-lane county road

Wildlife Score (Max = 10)	Safety Score* (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
5.3	1	6.3 [Rank 13/16]	5	11.3 [Rank 17/22]

*Score based on local knowledge; WVC data are not available for county roads.

Primary Target Species	Movement Type	Population Value to Species	WVC Rate
Bighorn Sheep	Local	High	Low
Canada Lynx	Dispersal	Low	Low
Elk	Winter range	Moderate	Low
Mule Deer	Winter range	Moderate	Low

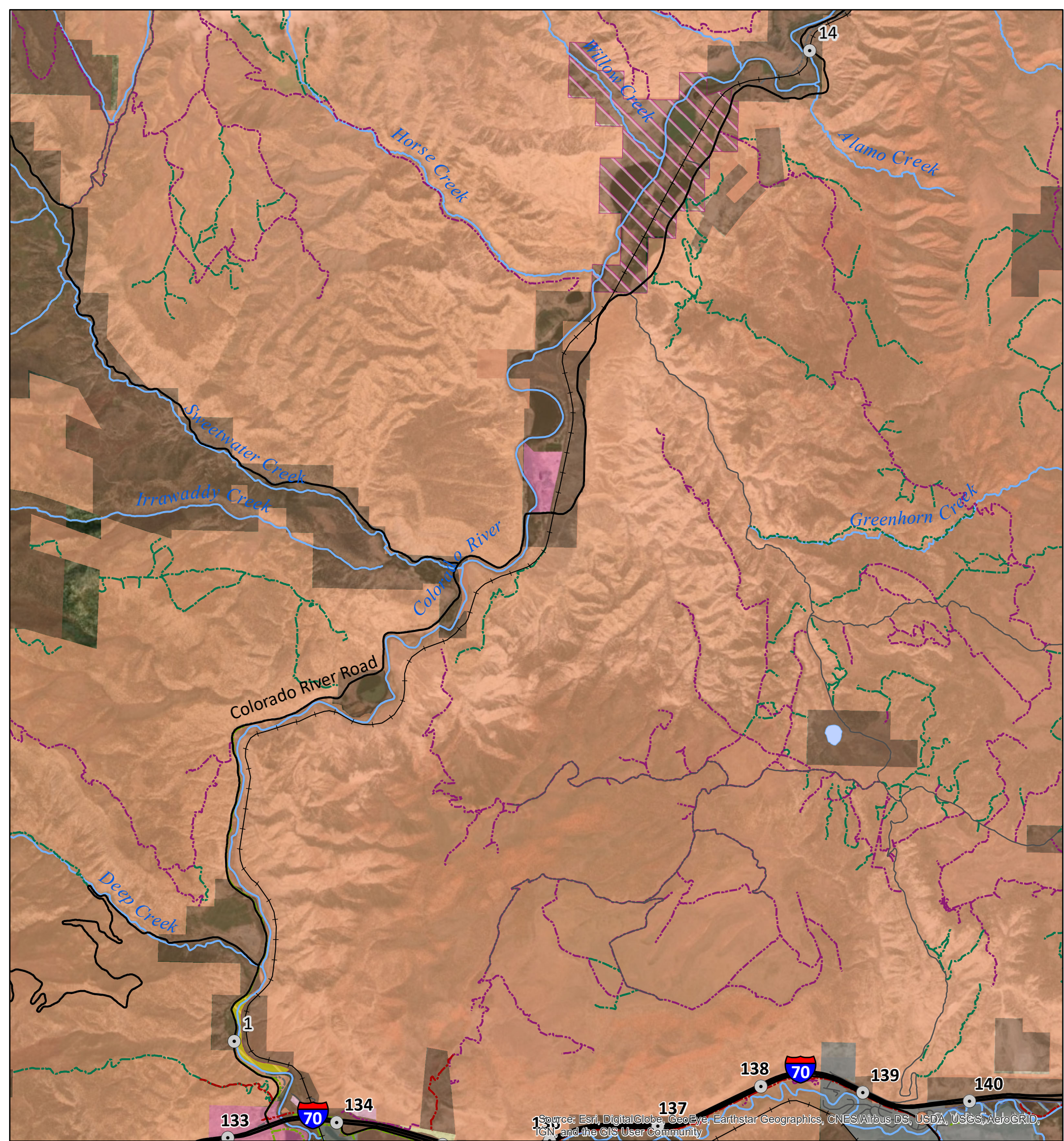
The Sweetwater segment extends from Dotsero (MP 0) to Red Dirt Creek (MP 14). Much of this landscape is owned and managed by the BLM, with the exception of some private lands along the river corridor. The linkage includes two conservation properties, including Nottingham Ranch Open Space and the 1,017 Colorado River Ranch conservation easement, which encompasses two miles of river frontage on both sides of the Colorado River.

CPW identifies this segment as a mule deer highway crossing and winter range for both deer and elk. CPW personnel note that WVC are particularly high north of Sweetwater Road, between Horse Creek and Poison Creek. Bighorn sheep are increasingly observed in this area, both from the Castle Peak herd and the more recently reintroduced Deep Creek herd.

Impacts to wildlife movement result from the railroad, which runs parallel to the river and the road and results in additional WVC; fencing; limited recreation activity (e.g., boating, trails); and special events, such as large bike events, which have a large impact over a short time frame. Commercial activity is present around the I-70 interchange but has little effect on wildlife movement.

Preliminary Connectivity Recommendations and Opportunities

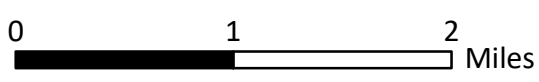
- Maintain the natural, rural character of this landscape to preserve wildlife habitat and wildlife movement patterns across Colorado River Road.
- Remove right-of-way fence or replace with a wildlife friendly alternative in wildlife movement areas.
- Manage recreation levels and activities to avoid impacts to wildlife.



Colorado River Road - Sweetwater (MP 1-14)

- Milepoints
- +— Railways
- ▭ Proposed Reservoir
- Zoning (Non-Public)***
- ▭ Agricultural
- ▭ Community Center
- ▭ Planned Unit Development
- ▭ Rural Residential
- ▭ Suburban Residential
- ▭ Town Boundary
- ▭ Current Conservation Easements
- ▭ Potential Development
- ▭ Wilderness
- ▭ Recommended Wilderness
- Land Manager**
- ▭ BLM
- ▭ State
- ▭ NGO/Land Trust**
- ▭ Private Conservation
- ▭ USFS
- Eagle Valley Regional Trail System**
- Proposed
- Existing/Under Construction
- Motorized
- Non-motorized
- Other Designation
- Technical Rock Crawling Only
- Undesignated***
- BLM Routes**
- Motorized
- Non-motorized
- Other Designation
- Technical Rock Crawling Only
- Undesignated***
- WRNF Routes**
- Existing
- Decommission****

* Agriculture = Resource and Resource Limited (35 acre lots and larger)
 Community Center = Fulford Historical, Commercial General and Limited, Industrial, Residential Multi-Family and Rural Centers
 Rural Residential = Agricultural Residential (10 acre lots), Agriculture Limited (5 acre lots), Rural Residential (2 acre lots)
 Suburban Residential = Residential Suburban Low and Medium Density
 ** Includes Denver Water Board
 *** Current use continues until route designated
 **** Planned or completed decommissioning



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Sources: BLM, CDOT, COMaP v10, Eagle County, ECO-Resolutions, ESRI, RMW, USFS, USGS
 Map prepared by RMW 11/2018 17-136

3. Colorado River Road, Catamount

Mileposts: 23-35

Objectives: Maintain connectivity for deer, elk and other wildlife

Land Ownership: BLM, Private

Road Type: Two-lane county road

Wildlife Score (Max = 10)	Safety Score* (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
2.7	1	3.7 [Rank 16/16]	4.5	8.2 [Rank 22/22]

*Score based on local knowledge; WVC data are not available for county roads.

Primary Target Species	Movement Type	Population Value to Species	WVC Rate
Elk	Migration	Low	Low
Mule Deer	Migration, local	Moderate	Low
Secondary Target Species			
Bighorn Sheep		Low	Low

The Catamount segment extends from Cabin Creek (MP 23) to SH 131 (MP 35). From Cabin Creek to Big Alkalai Creek the road runs south of the river corridor through ranch lands. From Big Alkalai Creek to SH 131 the road rejoins the river and the railroad. While much of this landscape is under BLM management, there are also a number of private ranches and agricultural lands.

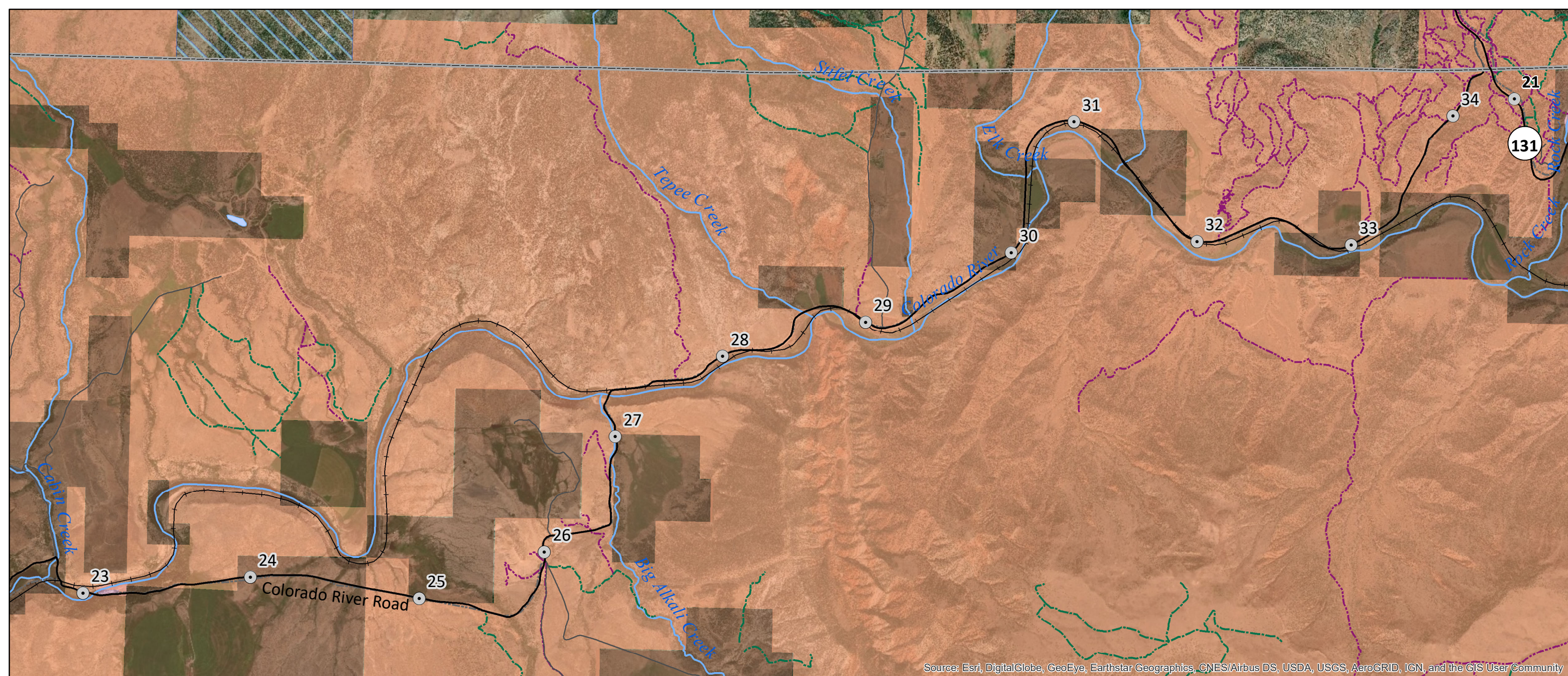
Mule deer and elk movements are dispersed through this area. The east side of the Cabin Creek drainage (north of the Colorado River) is an identified deer concentration area. Mule deer and elk winter range is present throughout this segment. Bighorn are present in the southwestern portions of this segment and are particularly known to congregate in Burns. Moose are also present along the Colorado River. WVC collisions are low for all species and when they do occur are largely related to train rather than road traffic, though even low WVC

rates may have population impacts for bighorn sheep. The segment of roadway east of Burns through private ranch lands is recognized as a road crossing zone for mule deer, and CPW personnel identify the section between Tepee Creek and Elk Creek as a high WVC segment.

The greatest threats to wildlife movement are due to the development and subdividing of private ranches, and increasing recreation, including river access, trails and special events.

Preliminary Connectivity Recommendations and Opportunities

- Maintain the natural, rural character of this landscape to preserve wildlife habitat and wildlife movement patterns across Colorado River Road.
- Remove right-of-way fence or replace with a wildlife friendly alternative in wildlife movement areas.
- Manage recreation levels and activities to avoid impacts to wildlife.

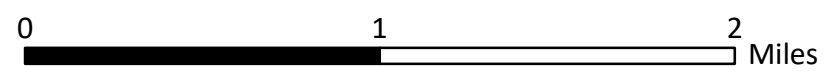


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Colorado River Road - Catamount (MP 23-35)

<ul style="list-style-type: none"> Milepoints Railways Current Conservation Easements Potential Development Proposed Reservoir 	<p>Zoning (Non-Public)*</p> <ul style="list-style-type: none"> Agricultural Community Center Planned Unit Development Rural Residential Suburban Residential Town Boundary 	<p>Land Manager</p> <ul style="list-style-type: none"> BLM State NGO/Land Trust** Private Conservation USFS 	<ul style="list-style-type: none"> Wilderness Recommended Wilderness <p>Eagle Valley Regional Trail System</p> <ul style="list-style-type: none"> Proposed Existing/Under Construction 	<p>BLM Routes</p> <ul style="list-style-type: none"> Motorized Non-motorized Other Designation Technical Rock Crawling Only Undesignated*** 	<p>WRNF Routes</p> <ul style="list-style-type: none"> Existing Decommission**** 	
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Sources: BLM, CDOT, COMaP v10, Eagle County, ECO-Resolutions, ESRI, RMW, USFS, USGS Map prepared by RMW 11/2018 17-136



* Agriculture = Resource and Resource Limited (35 acre lots and larger)
 Community Center = Fulford Historical, Commercial General and Limited, Industrial, Residential Multi-Family and Rural Centers
 Rural Residential = Agricultural Residential (10 acre lots), Agriculture Limited (5 acre lots), Rural Residential (2 acre lots)
 Suburban Residential = Residential Suburban Low and Medium Density
 ** Includes Denver Water Board
 *** Current use continues until route designated
 **** Planned or completed decommissioning

COTTONWOOD PASS ROAD

Cottonwood Pass Road is a small, dirt road that runs from the south end of the Town of Gypsum to SH 82 in the Roaring Fork Valley. While traffic volumes are currently low, this route is perceived by some as an alternate to Glenwood Canyon when I-70 is closed. Should this road be paved in the future to support increasing traffic volumes and speeds, the fragmentation impacts of the roadway would increase markedly.

1. Cottonwood Pass, Gypsum Creek Road to County Line

Mileposts: 2-20

Objectives: Maintain connectivity for deer, elk and other wildlife

Land Ownership: Forest Service, BLM, Private

Road Type: Two-lane county road

Wildlife Score (Max = 10)	Safety Score* (Max = 5)	Priority Score Wildlife + Safety (Max 15)	Opportunity Score (Max = 10)	Overall Score Priority + Opportunity (Max 25)
4	1	5 [Rank 15/16]	5	10 [Rank 20/22]

*Score based on local knowledge; WVC data are not available for county roads.

Primary Target Species	Movement Type	Population Value to Species	WVC Rate
Canada Lynx	Dispersal	Low	Low
Elk	Migration, winter range	Moderate	Low
Mule Deer	Migration, winter range	Moderate	Low
Secondary Target Species			
Bighorn Sheep		Low	Low

Cottonwood Pass is characterized not as a discrete wildlife linkage but rather as an expanse of continuous natural sagebrush and forested habitat that supports dispersed movements by mule deer, elk and

other wildlife. Much of this area except the highest elevation reaches is winter range for deer and elk, particularly the sagebrush and pasturelands in the lower elevation areas. A variety of wildlife may pass through this area and over Cottonwood Pass Road unimpeded. The rural and natural character of the landscape combined with low traffic volumes means that this area is permeable to wildlife movement.

The eastern side of the pass is mostly public lands, except for rural/agricultural areas near the Town of Gypsum. Human impacts to wildlife in these areas are due to motorized recreation activities, which are seasonally restricted in certain areas.

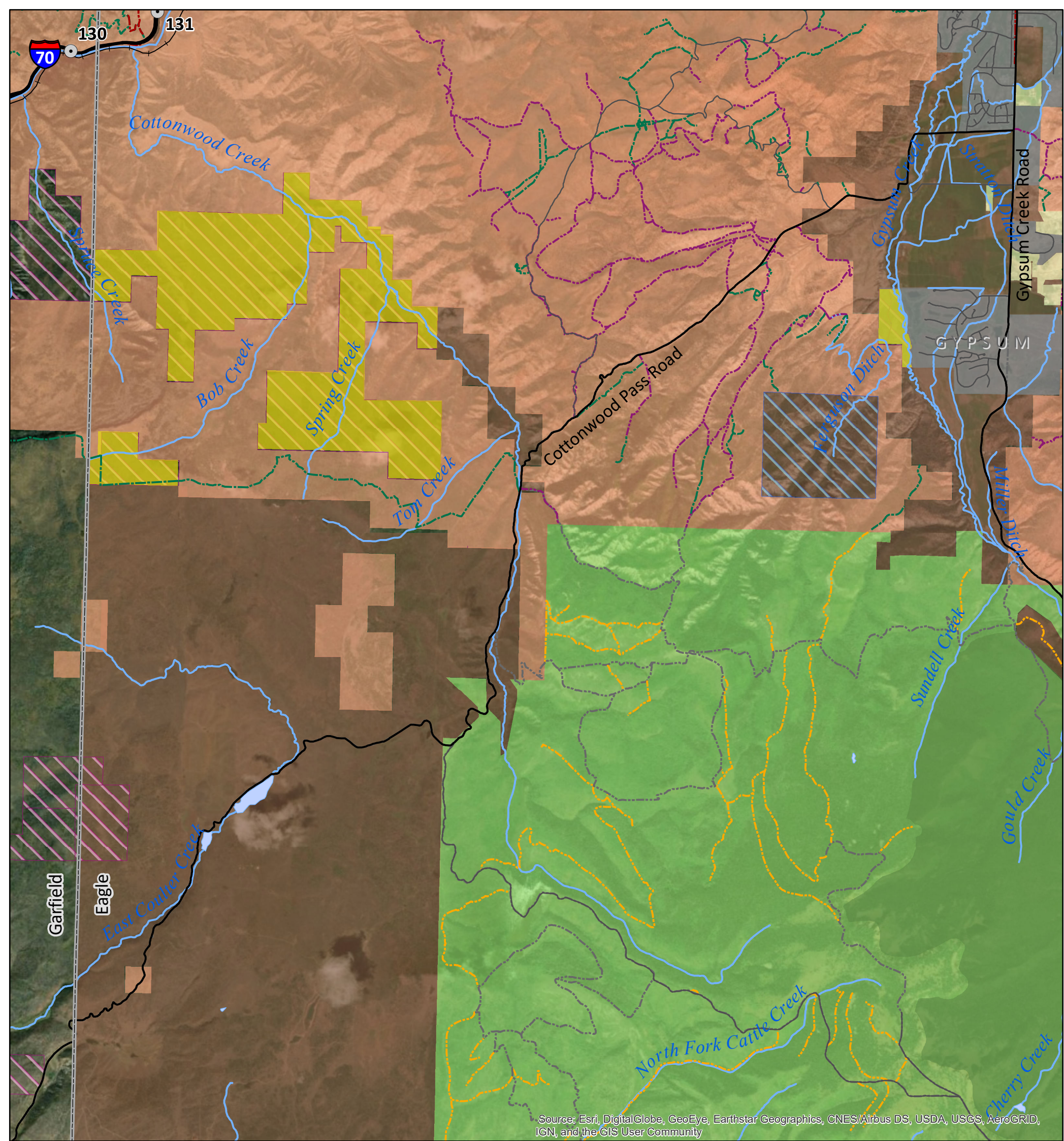
The western side of the pass is largely in private ownership, with rural ranch lands that transition to exurban development closer to the Roaring Fork Valley.



Sagebrush and forests along the lower portions of Cottonwood Pass

Preliminary Connectivity Recommendations and Opportunities

- Maintain the natural, rural character of this landscape to preserve wildlife habitat and wildlife movement patterns across Cottonwood Pass Road.
- Remove right-of-way fence and sheep fence or replace with a wildlife friendly alternative in wildlife movement areas.
- Manage recreation levels and activities to avoid impacts to wildlife.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Cottonwood Pass Road - Gypsum Creek Road to County Line (MP 2-20)

<ul style="list-style-type: none"> ● Milepoints —+— Railways ▭ Proposed Reservoir <p>Zoning (Non-Public)*</p> <ul style="list-style-type: none"> ▭ Agricultural ▭ Community Center ▭ Planned Unit Development ▭ Rural Residential ▭ Suburban Residential ▭ Town Boundary 	<ul style="list-style-type: none"> ▭ Current Conservation Easements ▭ Potential Development ▭ Wilderness ▭ Recommended Wilderness <p>Land Manager</p> <ul style="list-style-type: none"> ▭ BLM ▭ State ▭ NGO/Land Trust** ▭ Private Conservation ▭ USFS 	<p>Eagle Valley Regional Trail System</p> <ul style="list-style-type: none"> — Proposed — Existing/Under Construction <p>BLM Routes</p> <ul style="list-style-type: none"> — Motorized — Non-motorized — Other Designation — Technical Rock Crawling Only — Undesignated*** 	<p>WRNF Routes</p> <ul style="list-style-type: none"> — Existing — Decommission**** <p>* Agriculture = Resource and Resource Limited (35 acre lots and larger) Community Center = Fulford Historical, Commercial General and Limited, Industrial, Residential Multi-Family and Rural Centers Rural Residential = Agricultural Residential (10 acre lots), Agriculture Limited (5 acre lots), Rural Residential (2 acre lots) Suburban Residential = Residential Suburban Low and Medium Density ** Includes Denver Water Board *** Current use continues until route designated **** Planned or completed decommissioning</p>
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Sources: BLM, CDOT, COMaP v10, Eagle County, ECO-Resolutions, ESRI, RMW, USFS, USGS
 Map prepared by RMW 11/2018 17-136

IMPLEMENTATION

A key component of the Eagle County Safe Passages for Wildlife Plan is to build on the momentum generated by the development of this plan and the partnerships that are forming. Implementing the highest priority mitigation recommendations identified in this plan will require raising funds for the design and environmental review process through the construction phase. The stakeholder group convened on October 11, 2018 to conclude the planning process (this report) and to begin discussions about how to implement this plan, where to focus efforts initially and how each partner can contribute moving forward. The outcomes of the discussion are presented here.

The group did not discuss potential funding sources for wildlife-highway mitigation projects; however, a list of potential funding sources identified by the neighboring Summit County Safe Passages stakeholder group is provided in Appendix D.

INITIAL IMPLEMENTATION EFFORTS

Using the prioritization matrix rankings and list of preliminary recommendations, the group singled out linkage areas that present the greatest need for wildlife and safety and offer the best opportunities and partnerships for pursuing funding to construct wildlife crossing structures (Table 5). The group further identified additional needs where smaller projects would help to improve conditions for both wildlife and motorist safety in the near term, specifically: identifying smaller volunteer projects to remove unneeded fencing and launch education efforts to build community awareness. Combined, these reflect the stakeholders' near-term priorities; these may change as circumstances change.

Table 5. Top priority actions for near-term implementation.

Priority Linkage Area	Next Steps & Opportunities
I-70, Mud Springs	<ul style="list-style-type: none"> • Fence improvement project & Mud Springs culvert replacement • Recreation trail improvements • US 24 Interchange Project
I-70, West Vail Pass	<ul style="list-style-type: none"> • Construct wildlife crossing structures in coordination with the West Vail Pass Auxiliary Lanes Project
SH 82, Emma	<ul style="list-style-type: none"> • Engage other partners in Pitkin County; • Coordinate with the Watershed Biodiversity Initiative.
US 24 Minturn to Gilman (subset of the Dowd Junction to Red Cliff linkage area)	<ul style="list-style-type: none"> • Conduct more in-depth site assessment and engage Town of Minturn to refine specific mitigation needs and opportunities.

PARTNER ROLES

Participants were asked to share what they foresee as role of the organization or agency they represent as Eagle County Safe Passages moves forward. These roles are summarized in Table 6. This is not an exhaustive list; it may be amended as appropriate or as new partners become engaged.

Table 6. Partner roles for implementing wildlife crossing structure recommendations. Starred agencies or organizations are partners that were not represented at the meeting.

Agency or Organization	Role
State Agencies and Collaborative Efforts	
Colorado Department of Transportation	<ul style="list-style-type: none"> • Maintain dialogue with Eagle County and other partners • Be open to partnerships; • Maintain trust and commitments, including only taking on projects CDOT is sure it can deliver; • Align wildlife crossing priorities with safety needs; • Primary funding source; Identify partnership programs as potential funding sources; • Integrate wildlife crossings mitigation and best management practices into upcoming projects; • Construct and maintain wildlife crossings mitigation on state highways; • Conduct scoping and coordinate with project engineers; • Conduct internal education efforts regarding the value of wildlife crossings mitigation.
Colorado Parks and Wildlife	<ul style="list-style-type: none"> • Provide wildlife data and information; • Has strong landowner contacts; Assist with fence projects or easements on private lands; • Crossing design expertise and lessons learned from other mitigation projects; • Staff support and time for collaborative projects and during design and construction; • Future wildlife movement research.
Colorado Wildlife and Transportation Alliance	<ul style="list-style-type: none"> • Build awareness of local efforts like Eagle County Safe Passages and consider how to mimic these efforts in other areas; • Act as liaison to decision-makers to build support for wildlife crossings; • Build partnerships and awareness, and identify and create funding streams for wildlife mitigation projects; • Support internal efforts at CDOT and CPW to educate staff about the value of wildlife crossings.
CPW Commission*	<ul style="list-style-type: none"> • Funding support for wildlife crossings; • Champion wildlife connectivity in guidance to agency.

Table 6. (continued)

Agency or Organization	Role
Federal Agencies	
USDA Forest Service	<ul style="list-style-type: none"> • Coordinate habitat improvement projects with wildlife mitigation efforts; oversee volunteer projects on Forest Service lands • Use the Eagle County Safe Passages Plan to inform land management; • Staff support and time for collaborative projects; • Conduct education and awareness with community partners; • Champion connectivity at regional and national levels; • Possible source of mitigation funding.
Bureau of Land Management	<ul style="list-style-type: none"> • Provide information and consistency with plans and policies on BLM lands.
US Fish and Wildlife Service	<ul style="list-style-type: none"> • ESA Section 7 consultation and possible ESA funding.
Local Governments	
Eagle County	<ul style="list-style-type: none"> • Ask Commissioners to adopt the plan; • Integrate data, maps and recommendations into land use regulations; zoning overlays and site development standards; • Use the Safe Passages plan as a reference to inform the Comprehensive Plan update; • Funding support from Capital Improvement Project funds (request annual funding allocation rather than project-specific funds); • Help from the County Engineering Department with feasibility studies.
Pitkin County Open Space and Trails*	<ul style="list-style-type: none"> • Coordinate habitat improvement projects with wildlife mitigation efforts; • Oversee volunteer projects on county open space;
Town of Vail	<ul style="list-style-type: none"> • Present Eagle County Safe Passages to the Town Council; • Collaborate with CDOT and other partners (e.g., ECO trails) on projects around Vail, including Mud Springs, West Vail Pass and a possible future project to cut and cover the interstate through Vail; • Community support and funding for local projects.
ECO Trails	<ul style="list-style-type: none"> • Partner to minimize trail impacts on wildlife movement; • Possible funding source where mitigation projects coordinate with trails.

Table 6. (continued)

Agency or Organization	Role
Nonprofit Organizations	
Eagle Valley Land Trust	<ul style="list-style-type: none"> • Conduct volunteer projects and pursue funding for habitat improvements on lands with conservation easements; • Build new relationships with private land owners and pursue conservation easements on key private parcels.
Walking Mountains Science Center	<ul style="list-style-type: none"> • Educate staff about Eagle County Safe Passages and determine ways to integrate the goals of this project into existing programs; • Develop volunteer opportunities with other partners.
Wilderness Workshop	<ul style="list-style-type: none"> • Represent Eagle County Safe Passages in the Roaring Fork Valley and coordinate with local partners; • Education, outreach and grassroots engagement; • Fundraising for mitigation and conservation projects, including working with potential large donors to provide seed funding.
Roaring Fork Conservancy*	<ul style="list-style-type: none"> • Coordinate open space acquisitions or easements with wildlife connectivity objectives.
Watershed Biodiversity Initiative*	<ul style="list-style-type: none"> • Coordinate efforts on the Roaring Fork Watershed Biodiversity and Connectivity Study, in particular, with regards to the SH 82 Emma linkage area.
Private Entities	
Vail Resorts*	<ul style="list-style-type: none"> • Build education and awareness among ski resort visitors; • Funding and support for wildlife crossings.
Battle Mountain*	<ul style="list-style-type: none"> • Maintain communication channels to integrate considerations for wildlife movement areas and wildlife habitat into future development plans.
Residents of Eagle County	<ul style="list-style-type: none"> • Volunteer; • Engage schools and integrate with existing community programs; • Help bring recreation and other community interests to the table.
Recreation Groups*	<ul style="list-style-type: none"> • Educate user groups about wildlife movement needs; • Coordinate trails and recreation use with wildlife activity and habitat.

NEXT STEPS

The group identified the following next steps to keep Eagle County Safe Passages moving forward:

Outreach and Education Actions:

- Present outcomes and priority actions to the Board of County Commissioners. Coordinate funding requests with CDOT to ensure that delivery expectations can be met (Dec 2018).
- Create a one-page summary of Eagle County Safe Passages for distribution.
- Present outcomes and priority actions and estimated costs to Towns, including smaller and volunteer projects.
- Develop a near-term education and outreach program to build community awareness and engage schools
- Present outcomes and priority actions to the Capital Improvements Projects group, and request funding for the next budget year.

Transportation Project Actions:

- Develop cost estimates for priority actions (for big projects and low hanging fruit). Large transportation projects may require a feasibility study to get more defined projects and more precise cost estimates.
- Develop benefit-cost analyses and work together to pursue implementation actions in the four near-term implementation priority areas (I-70 Mud Springs, I-70 West Vail Pass, SH 82 Emma and US 24 Minturn to Gilman). Determine how these efforts will be coordinated.

Linkage Habitat Conservation Actions:

- Identify the most feasible opportunities for small volunteer projects to remove unneeded fencing; Investigate funding for fence removal projects (e.g., ConocoPhillips Spirit grants).
- Collaborate with Eagle County Planning to provide guidance and direction for integrating Eagle County Safe Passages into county planning, zoning and regulations.
- Identify conditions that would trigger the stakeholders to convene, e.g., an upcoming transportation project in any of the linkage areas.
- Integrate linkage areas in the context of cumulative impacts from trails and other recreation activities; Work towards coordinating with recreation groups.
- Coordinate with partners on integrating Eagle County Safe Passages with other studies or efforts, e.g., Forest Service and BLM plans, Watershed Biodiversity Initiative.

REFERENCES

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- Kintsch, J., and P. Singer. 2016. Eagle County wildlife connectivity assessment: Phase I, identification of habitat linkages across major highways. Report to Eagle County Government, Eagle, CO.
- Kintsch, J., B. Ruediger, P. Singer, and A. Nettles. 2017. Summit County safe passages: A county-wide connectivity plan for wildlife. Report to the USDA Forest Service, Dillon Ranger District, Dillon, CO.
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- Singer, P., A. Huyett, J. Kintsch and M. Huijser. 2011. Interstate 70 Eco-Logical Monitoring and I-70 Wildlife Watch Report. Final Report to the Colorado Department of Transportation, Denver, CO.
- SREP. 2007. Citizen science wildlife Monitoring on Vail Pass. Unpublished Data. Southern Rockies Ecosystem Project, Denver, CO.

APPENDICES

APPENDIX A: STAKEHOLDER LIST

The following stakeholders participated in one or more in person meetings, held at various locations around Eagle County. Site visits were held over three days to visit the highest priority linkage areas; participants varied at each site visit, depending on their interest and familiarity with each linkage area.

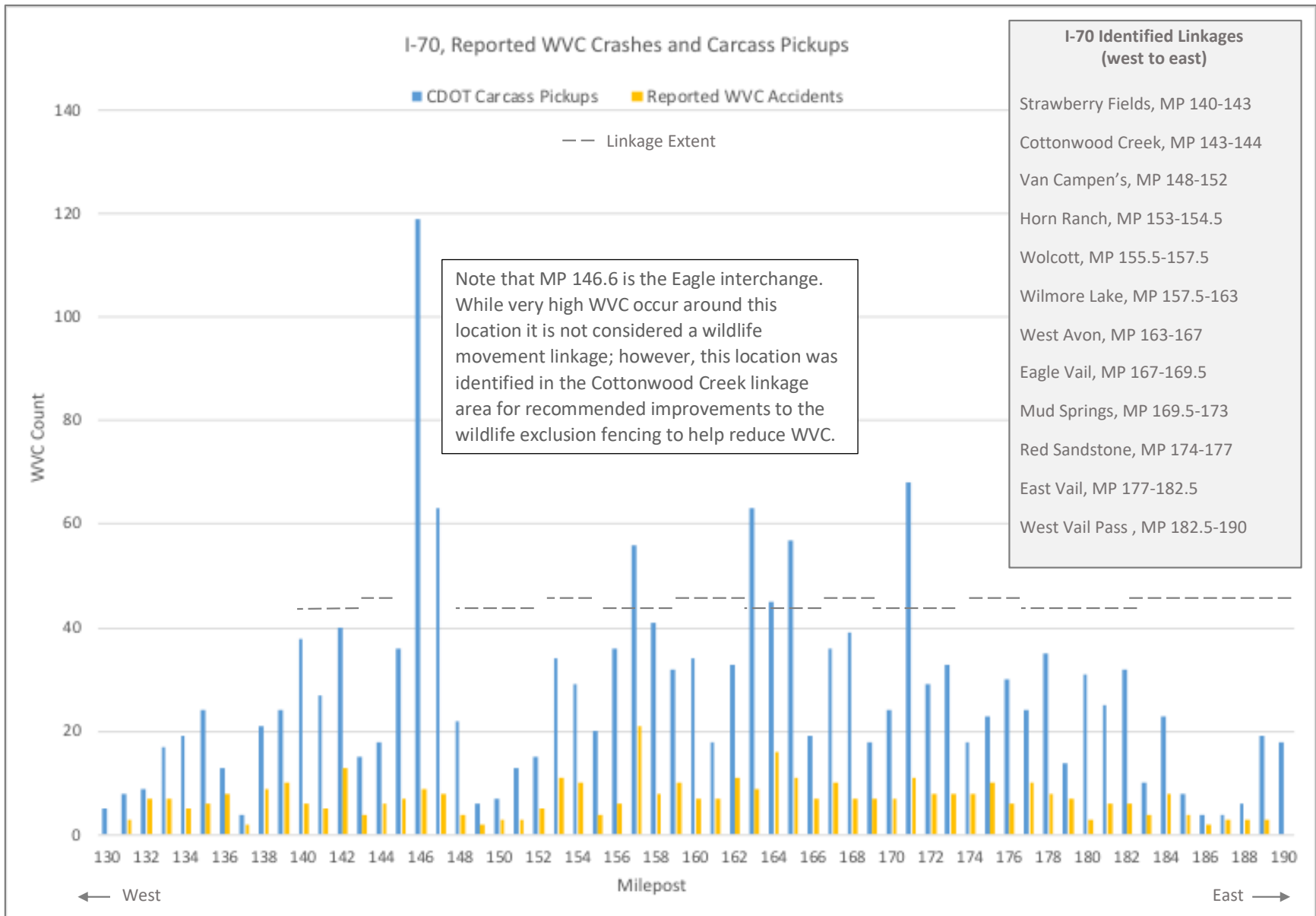
Name	Affiliation	In Person Meetings (does not include conference calls)					
		Kickoff Meeting	Expert Workshops	Basalt Meeting	Prioritization Meeting 3/13/18	Site Visits	Implementation Meeting
Bill Andree	Colorado Parks and Wildlife		X		X		
Jared Barnes	ECO Transit						X
Greg Barrie	Town of Vail	X	X		X	X	
Karen Berdoulay	Colorado Department of Transportation	X					X
Kristen Bertuglia	Town of Vail	X	X		X	X	
Hillary Boyd	BLM - Colorado River Valley field Office	X	X		X		X
Fritz Bratschie	Vail Resorts - Beaver Creek	X					
Tom Cardamone	Biodiversity Inventory			X	X		
Michelle Cowardin	Colorado Parks and Wildlife	X	X		X	X	X
Jim Daus	Eagle Valley Land Trust		X			X	
Taylor Elm	Colorado Parks and Wildlife			X	X	X	X
Jessica Foulis	Eagle Valley Land Trust	X	X		X	X	X
Ben Gerdes	Eagle County	X	X			X	
Marcia Giles	USDA Forest Service, Holy Cross RD	X					
John Groves	Colorado Parks and Wildlife			X			
Mike Jackson	Vail Resorts	X			X		
Julia Kintsch	ECO-resolutions	X	X	X	X	X	X
John Kronholm	Colorado Department of Transportation		X		X	X	X
Kim Langmaid	Walking Mountain Science Center		X			X	X

Name	Affiliation	In Person Meetings (does not include conference calls)					
		Kickoff Meeting	Expert Workshops	Basalt Meeting	Prioritization Meeting 3/13/18	Site Visits	Implementation Meeting
Cinnamon Levi-Flynn	Colorado Department of Transportation		X			X	X
Heather Lewin	Roaring Fork Conservancy			X		X	
Jon Leyba	Colorado Department of Transportation				X		
James Lindt	Town of Basalt					X	
Jamie Malin	Vail Valley Mountain Bike Association	X			X		
Julie Mao	Colorado Parks and Wildlife			X		X	
Tim McGuire	Battle Mountain				X		
Jacci McKenna	Resident						X
David McWilliams	Town of Avon	X			X		
Kaitlyn Merriman	Walking Mountain Science Center		X				
Ray Merry	Eagle County				X		X
Martha Miller	Colorado Department of Transportation						X
Bart Necessary	Colorado Department of Transportation					X	
Ashley Nettles	USDA Forest Service, Dillon RD	X	X			X	
Adam Palmer	Eagle County	X	X	X	X	X	X
Jen (Austin) Prusse	USDA Forest Service, Holy Cross RD	X	X		X	X	X
Graham Riddile	Colorado Department of Transportation			X			
Will Roush	Wilderness Workshop			X		X	X
Scott Schlosser	Haymeadow/ Eagle County Conservation District	X	X		X		
Sloan Shoemaker	Wilderness Workshop		X	X		X	
Paige Singer	Rocky Mountain Wild	X	X	X	X	X	X
Gary Tennenbaum	Pitkin County Open Space and Trails			X			
Rick Truex	USDA Forest Service						X
Lindsey Utter	Pitkin County Open Space and Trails			X		X	
Peter Wadden	Town of Vail				X	X	
Craig Wescoatt	Colorado Parks and Wildlife		X		X		
Brian Wodrich	Colorado Parks and Wildlife	X	X		X	X	
Matt Yamashita	Colorado Parks and Wildlife			X		X	

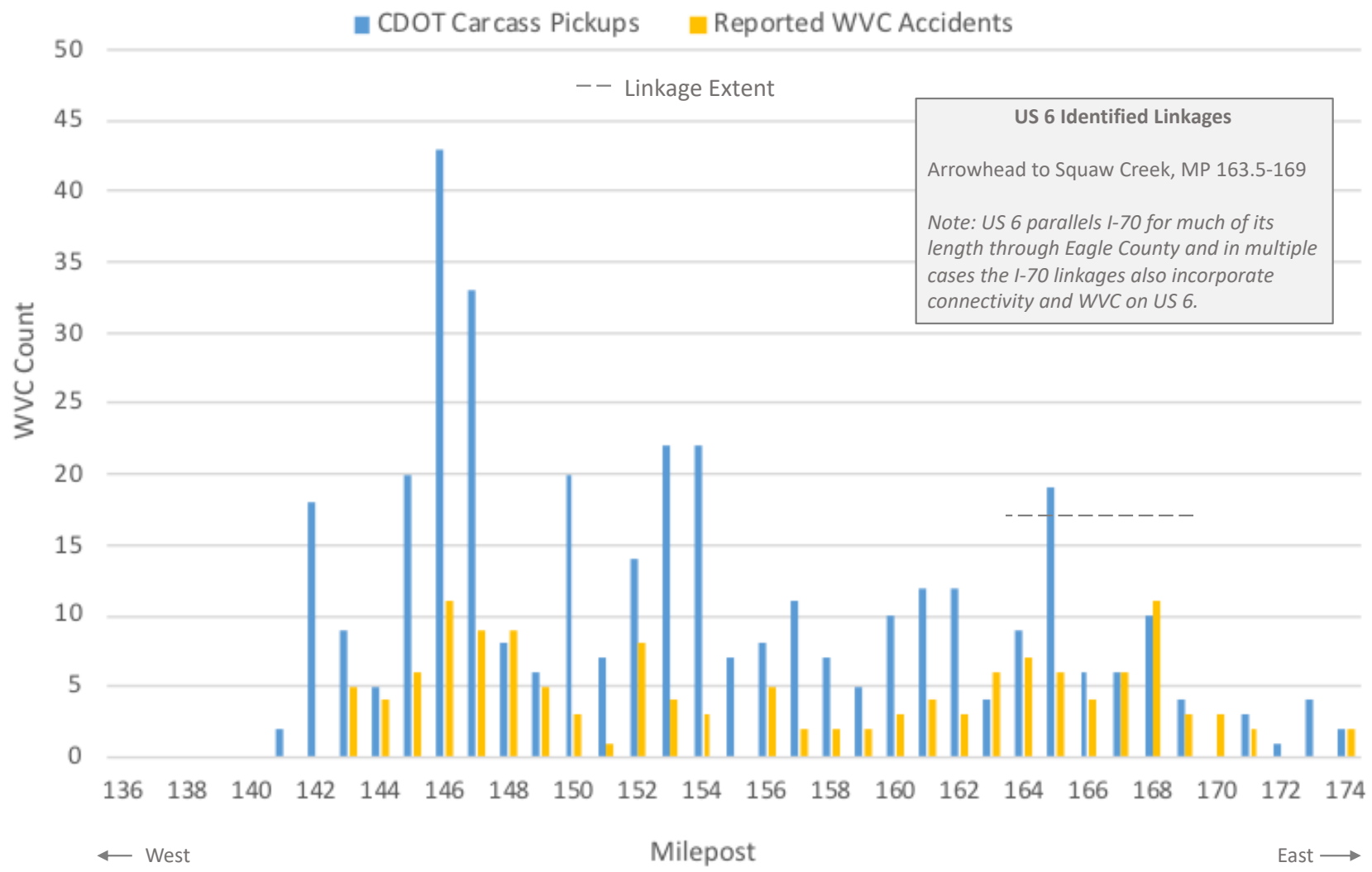
Eagle County Safe Passages for Wildlife – Appendix A

APPENDIX B: WILDLIFE-VEHICLE COLLISION GRAPHS

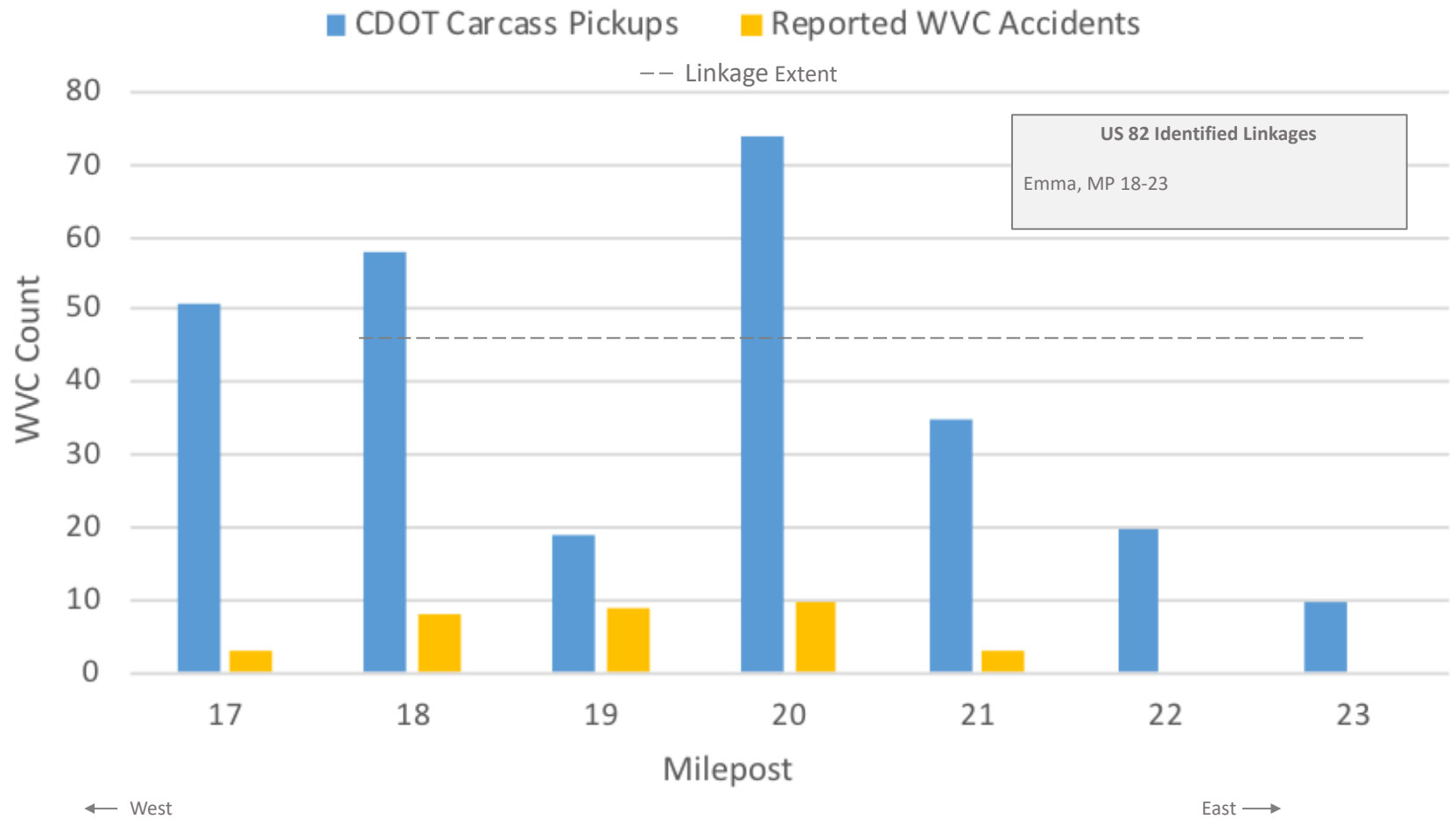
The following graphs depict, for each CDOT administered highway in Eagle County, reported WVC accidents and recorded WVC carcass pickups between 2007 through 2016. These graphs were one of several data layers used to identify wildlife linkage areas in Eagle County during the expert workshops. Note that the y-axis scale may vary on each graph.



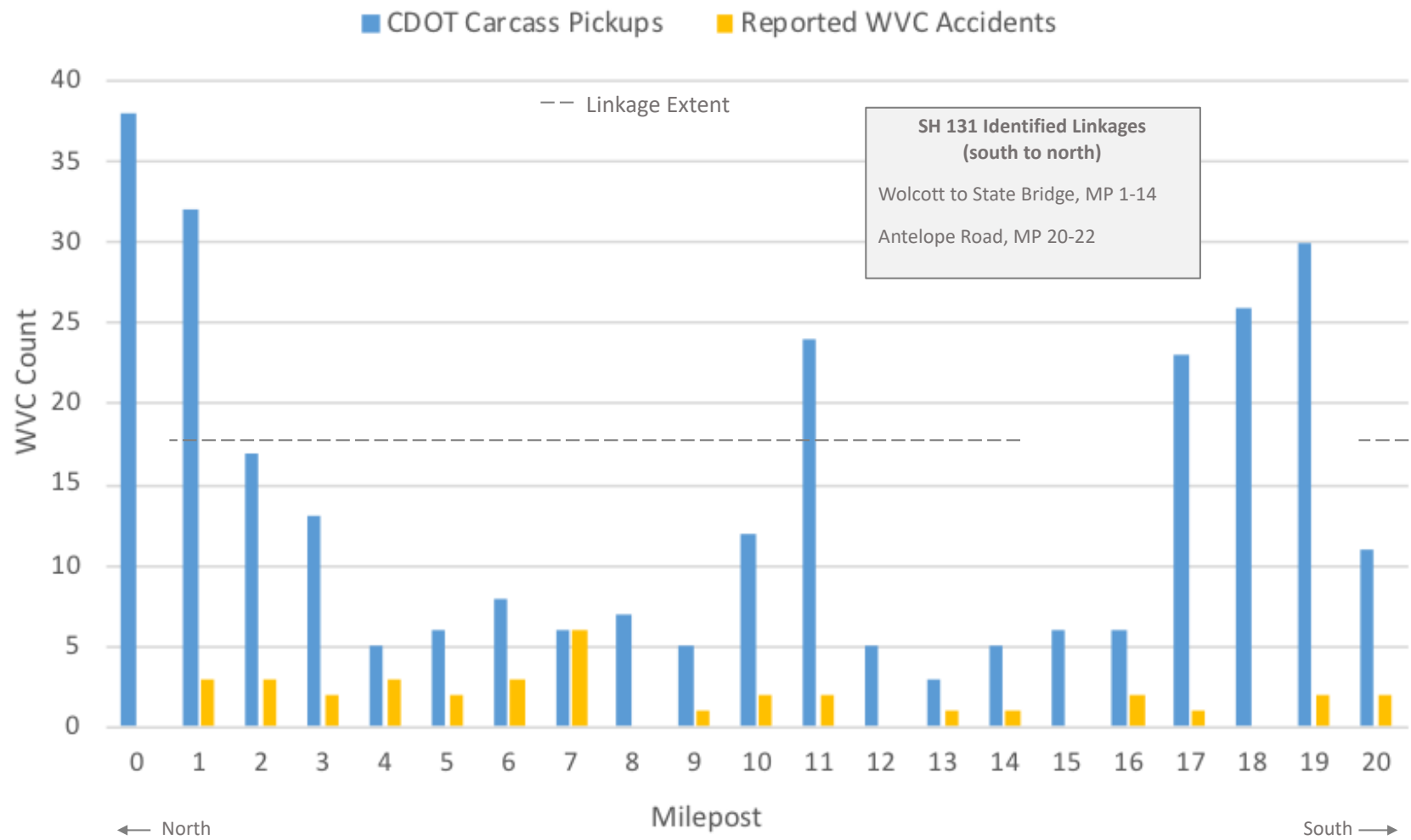
US 6, Reported WVC Crashes and Carcass Pickups



US 82, Reported WVC Crashes and Carcass Pickups



SH 131, Reported WVC Crashes and Carcass Pickups



APPENDIX C: WILDLIFE-HIGHWAY LINKAGE FORM

1. **Linkage Area Number (Format = Hwy#-StartMP):**

2. **Linkage Name:**

3. **Mile Posts:**

4. **General Habitat.** Indicate all major habitat types that apply to linkage area:

- Spruce/Fir Mixed Conifer Aspen
 Sagebrush Steppe Riparian Large Riverine

5. **Land Uses** (estimate in increments of 10%):

- _____ Natural _____ Agricultural _____ Developed Recreation
_____ Other Recreation _____ Urban _____ Suburban
_____ Commercial/Industrial _____ Rural

Describe:

6. **Target Species:**

- Lynx Elk Mule Deer Moose Bighorn Sheep
 Boreal Toad

Other Mammals:

Reptiles:

Amphibians:

Other:

7. **Significance of Linkage Area**

- Local (e.g., daily movements within a seasonal range)

Explain local movements:

- Regional (e.g., migratory movements between seasonal ranges)

Explain regional movements:

- Ecosystem (e.g., dispersal movements or movement between major mtn. ranges)

Explain ecosystem movements:

8. **What existing features facilitate animal movement through the linkage area** (check all that apply):

- Waterway Riparian Habitat Continuous Habitat Cover
 Existing Bridges/Culverts Other (specify):

9. **Is the linkage biological pinch-point?** Yes No

5. Migratory Herds (Ungulates)

Yes No Species and Numbers:

6. Is there a significant number of highway mortality? High Mod. Low

Species:

Are there specific mileposts/locations of concern for WVC? Specify:

7. Attractants

Water Riparian Ag Fields Cover
 Forage/Prey Garbage/Human

Describe:

8. What current threats or barriers to wildlife movement occur within the linkage area?

Indicate current (C) or future (F).

C F Residential Development C F Other Roads
C F Habitat Management C F Fencing
C F Developed Recreation C F Motorized Recreation
C F Non-motorized Recreation C F Natural Barriers
C F Other (specify):

9. Score the overall threat to connectivity in this linkage. Circle one. (Scale 1-5, where 1 = no threat/secure; 3 = moderate threat; 5 = severe threat/imminent loss)

1 2 3 4 5

12. Land Ownership/Management

Forest Service BLM State _____
 Private

Describe any lands with protected status in linkage area:

APPENDIX D: PARTIAL LIST OF FUNDING SOURCES FOR WILDLIFE CROSSING DESIGN AND CONSTRUCTION

Source: Summit County Safe Passages (Kintsch et al. 2017)

Funding Source	Details
Colorado Department of Transportation	State DOTs have traditionally been the primary funding source for most wildlife crossing and mitigation projects. Funding programs within CDOT that may be used for wildlife mitigation include the Regional Priority Program and the FASTER Safety Program, which may be appropriate for wildlife fencing or reconstruction projects.
Federal Lands Access Program/Federal Lands Transportation Program	Qualifying projects include environmental mitigation in or adjacent to federal lands to improve public safety and reduce WVCs while maintaining habitat connectivity.
Transportation Alternatives Program (TAP)	Typically funds bike and pedestrian facilities, however may also fund smaller environmental mitigation projects. https://www.codot.gov/programs/planning/tap-cfp
Farm Bill	NRCS Colorado (funding for non-federal entities) EQUIP program/wildlife
State Discretionary Grant Programs	CPW Habitat Partnership Program (e.g., install wildlife friendly fencing on private lands)
State Transportation Bill	Legislature may fund a transportation bill in the next session, including money for the West Vail Pass climbing lanes project and associated mitigation; Increase gas tax for wildlife mitigation.
Resource Agencies (CPW, USDA Forest Service, BLM)	May provide direct contributions, land exchanges or purchases in wildlife corridors, or compatible habitat management in wildlife corridors.
County Open Space	Coordinate conservation easements or land purchases in wildlife corridors.
Land Trusts (Eagle Valley Land Trust)	Coordinate conservation easements or land purchases in wildlife corridors.
Great Outdoors Colorado (GOCO)	Potential state funding option.

Funding Source	Details
Department of Local Affairs (DOLA)	Potential state funding option.
Ballot initiative to renew open space sales tax	Include wildlife crossing structures as a possible use of open space sales tax in the next initiative renewal (examples include Pima County, AZ and Teton County, WY).
Non-governmental Organizations (e.g., Rocky Mountain Elk Foundation, Mule Fanatics, Mule Deer Foundation, Humane Society, Theodore Roosevelt Conservation Partnership, Summit Foundation, Rocky Mountain Wild)	Depending on the organization, NGOs may make direct funding contributions, coordinate private fundraising efforts for wildlife crossings, including fundraising events, or conduct public outreach and education campaigns.
Insurance Companies	Direct contributions; public outreach and education.
Foundation Grants	E.g., Gates Foundation, Doris Duke, others.
Private Donations	Private donations from conservation-minded citizens.
Endowments	Bequests and donations from estates by conservation-minded citizens.
Wildlife Crossing Foundation	Set up a foundation to collect monies (local or national) for wildlife crossings. Elicit help from existing foundations like the National Forest Foundation, Fish and Wildlife Foundation, National Park Foundation, etc.
Impact Fees	Development fees to offset impacts of development.
User Fees	For example, \$1 add-on to ski tickets and passes.
Events	Brew festivals, community fundraisers or concerts, Wildlife Crossings Ski Day, etc.
Product Sponsorship	Find product sponsors who will donate a portion of the product sales to wildlife crossings.
License Plate	Wildlife crossings plate
Adopt-an-Overpass	Develop a program to raise funds while engaging local citizens and businesses. Such a program may include signage or an ad campaign, and may need to be coordinated with FHWA.