



I-70 Bakerville to Eisenhower-Johnson Memorial Tunnels (EJMT) Westbound Auxiliary Lane ALIVE ITF Meeting #1

Meeting Summary

November 7, 2022, 10:00 AM - 11:30 AM

In Person and Virtual Meeting

1. Welcome and Agenda Review

Mandy Whorton (Peak Consulting Group) welcomed the group, and did a roll call of participants:

- Francesca Tordonato, CDOT
- Maria Rocken, CDOT
- Erik Schmude, CDOT
- Kristin Salamack, USFWS
- Michelle Cowardin, CPW
- Joe Walter, CPW
- Mark Lamb, CPW
- Carrie DeJacomio, Ulteig
- Angy Casamento, Uletig
- Lindsey Wickman, Ulteig
- Stephanie Gibson, FHWA
- Brian Dabling, FHWA
- Nicole Malandri, United States Forest Service (USFS)
- Aurelia Denasha, United States Forest Service (USFS)
- Charlene Juanico, United States Forest Service (USFS) Intern
- Julia Kintsch, ECO-resolutions
- Paige Singer, Rocky Mountain Wild
- Sirena Brownlee, HDR
- Mandy Whorton, Peak Consulting Group
- Loretta LaRiviere, Peak Consulting Group

The presentation from the meeting is attached to these notes for reference.

2. Project Overview/Purpose and Need

Mandy said this project is about a six-mile auxiliary lane in the westbound direction from the Bakerville exit to the Eisenhower Johnson Memorial Tunnel (EJMT). It was identified in the Tier 1 Programmatic Environmental Impact Statement (PEIS) as an Auxiliary Lane, which were generally identified in areas where there were slow-moving vehicle conflicts. The purpose of the Tier 1 Improvements is to improve safety, mobility and decrease congestion. Most of the data from the PEIS are quite old, from the mid to early 2000s, and new data will be collected.

All Tier 1 projects must follow a Tier 2 process. For this Tier 2 project, we have identified the same trends in safety and mobility issues as in Tier 1 with some project-specific operational issues due to the location at the continental divide:

Safety Concerns: Crash reductions



- Operational Issues:
 - Speed differentials between slow and fast-moving vehicles
 - Unreliable and long travel times
 - Freight operations - Hazmat trucks going over Loveland Pass and safe chain stations for these vehicles
 - High number of I-70 incident closures from landslides, crashes or inclement weather

This project was included in the PEIS Preferred Alternative Minimum Program of highway improvements as a specific highway improvement. It includes the auxiliary/climbing lane, the Loveland interchange, chain up stations and wildlife crossing mitigation.

The highway is located on an easement within US Forest Service land with limited communities. Loveland Ski Area is also a big stakeholder. There is a lot of formal and informal recreation that occurs in the area. There are also a lot of sensitive environmental resources throughout this area.

3. ALIVE MOU and Previous Studies

ALIVE Memorandum of Understanding

Julia Kintsch (ECO-resolutions) noted the MOU was signed in 2008.

The purpose of the MOU was to:

- Reduce wildlife-vehicle collisions (WVCs)
- Increase permeability for wildlife in the I-70 corridor
- Streamline interagency coordination

The intent of the MOU is to:

- Ensure wildlife passage is improved and wildlife-vehicle collisions are decreased, specifically in the identified Linkage Interference Zones (LIZs). The original ALIVE Committee identified 13 LIZs along the Corridor.
- Ensure agencies' full cooperation in early and full implementation of corrective actions to solve permeability problems in the identified LIZs

Other Studies:

The I-70 Ecological Framework: A Regional Ecosystem Framework for Terrestrial and Aquatic Wildlife Along the I-70 Mountain Corridor

- This study was done in 2011.

The Objective was:



- To create a standardized and transparent process for assessing WVC reduction and wildlife permeability needs in the Corridor.

The Outcomes were:

- 17 LIZs were identified in 2011 in validating and refining the original LIZs from 2008.
- An Implementation Matrix that provides guidance and considerations for all stages of the project planning process.
- Guidelines and best practices for improving aquatic and terrestrial connectivity.

LIZs in Project Area

The Bakerville LIZ extends from MP 216.4 to MP 227.1 which is from the Loveland exit to near Georgetown. Wildlife crossings will be considered on the western portion of the LIZ from MP 216 to MP 221.3, where this project is located. The project area of the LIZ is entirely within the Arapaho Roosevelt National Forest.

The target species are:

- Primary: Canada lynx and secondary: bighorn sheep, Black bear, boreal toad, elk, mountain lion, mule deer and the northern leopard frog

As a part of this 2011 Ecological Framework study, the research team identified very high-level potential locations for wildlife crossings, which provides a starting point for reviewing and identifying new locations.

I-70 Traffic and Revenue Study

This study was initiated in 2013 to explore solutions to congestion on the I-70 Mountain Corridor from Golden to Silverthorne and evaluate different roadway design alternative costs. The ALIVE committee reviewed the initial recommendations for crossing structures but did not evaluate any new locations. The study terminated in 2014.

I-70 Crossing Review for the Floyd Hill Project

Recently, the Floyd Hill Project evaluated wildlife mitigation opportunities east of EJMT, including two within the Bakerville project area, at Dry Gulch (MP 217.4) and Kearney Gulch (MP 220.5). Both of these locations we found to have high biological and connectivity values but were not prioritized for stand-alone mitigation. There was uncertainty about future projects and the concern that any crossing structure at these locations might be a throwaway cost. Therefore, these two locations did not move forward as part of the Floyd Hill mitigation package, and two early projects for wildlife mitigation were developed: an underpass on I-70 near Genesee and a Bighorn sheep overpass on US 40 near Empire.

4. Wildlife Issues and Concerns

Threatened and Endangered Species:



Canada lynx

- A study done in 2017 modeled the potential for lynx roadway crossings across the state, and it noted there is a high probability of lynx high crossings in the Bakerville project area because of the good habitat.
- There were two recorded lynx-vehicle mortalities in August 2000 at MP 220.9 and May 2005 at MP 217.3
- Barriers to movement include expanded highway footprint and increased traffic volumes, additional median and shoulder barriers and new rock cuts, and lighting at interchanges, chain stations and signage. These are all considered cumulative impacts. Current conditions already provide a lot of impacts to lynx and to other wildlife in this corridor.
- CPW completed the Ivan Study in 2012 which documented lynx collar data from 1999-2010. While the study didn't show specific locations where the lynx crossed the highway, it did indicate broad movement areas, which were active in the project area. Winter snow tracking was also done to confirm road crossing locations.
- The question was raised about how many collared lynx are in the project area. Julia said it was a statewide study done in 2012. No lynx are currently collared in the state, and the exact population size is unknown.
- Julia said this project may result in a "likely to adversely affect" determination for Section 7 of the Endangered Species Act which would require mitigation or conservation measures. (The Programmatic Biological Opinion did not offer any particular conservation measures, and several noted that the recommendations are outdated and would need to be reconsidered.) Any wildlife crossings to restore connectivity across the interstate would improve lynx access to habitat and their dispersibility ability and reduce the potential for wildlife vehicle collisions.
- Summer and winter recreation impacts lynx habitat and activity in the project area. There is a lot of recreation activity not just at the Loveland Ski area, but throughout the corridor. Herman Gulch is a popular recreation area, particularly in the summer. Also, winter and summer recreation access exists at Dry Gulch and Bakerville.
- Michelle Cowardin (CPW) said CPW maintains a long-term lynx sighting database where the public or even professionals can report sightings, which CPW validates and ranks. She suggested following up with Eric Odell about getting the sightings database, which often includes associated pictures.
- Michelle suggested wolverines be added to the wildlife species of concern in the project area. She noted that a collared wolverine (M56) travelled between Grand County on the Divide and Bierstadt Mountain and over near Leadville between 2009-2012. Although we don't know where M56 crossed I-70, it's possible that he crossed within the project area. Michelle sent a map of M56's collar locations and said Eric would be able to provide additional information about public sightings. Julia will follow up with Eric.
- Greenback cutthroat trout should be added as an endangered species.



Boreal Toad

- Julia said there are historic breeding ponds adjacent to I-70 at MP 217.9, MP 218.7 and MP 220.8. Some of the connectivity needs for boreal toad are uncertain so any input or information that people might be able to share would be welcome.
- Considerations for boreal toad connectivity can be incorporated into the design of larger wildlife crossing structures. Based on our current information, it does not seem that there is a need for a specialized culverts in the project area. Julia will confirm with Harry Crocket at CPW.
- Michelle said it is important for the toads to cross the roadway but being able to contain mag chloride or sand runoff from the highway into the habitat system is probably a bigger issue. There are impacts to aquatic habitat from winter maintenance activities on the west side of I-70.
- Francesca Tordonato said there's a breeding site on the west side of EJMT where breeding has been documented in CDOT's water quality ponds. The White River National Forest has been monitoring toad breeding activity in the water quality pond so they might have some relevant data.
- Michelle said they have information on that breeding site in Straight Creek (on the west side of the EJMT) and noted a significant die off-of the willow community and riparian community in that area. This could be a combination of drought and mag chloride runoff. She said CPW aquatic biologists were monitoring. Francesca noted that based on communication with CPW (Paul Winkle) Chytrid fungus is impacting toads in the Clear Creek watershed.
- Aurelia said she thinks the White River National Forest Product biologist probably has the best information about breeding activity in water quality ponds. It would be interesting to follow up on that.

Terrestrial Wildlife Impacts could include:

- Habitat loss may occur from the expanded highway footprint; however, some widening may occur into the median. Habitat loss is also likely with the expansion of the existing chain stations or the addition of new ones.
- an increase in the barrier effect due to an additional lane and additional traffic volumes will impact wildlife trying to cross I-70.
- Impacts due to increased median and shoulder barriers
- Lighting impacts at interchanges, chain stations, and signage
- Likely to see a potential increase in wildlife vehicle collisions. However, there could also be a potential decrease because of the increased barrier effect. Just because we see a decrease in collisions isn't necessarily a good thing.

Elk

- Elk summer range and concentration areas are in our project area, as well as a winter range area around Bakerville. Elk are important to consider from a design standpoint because they are more particular about what they're willing to use for the crossing



structure. The wildlife crossings need to be designed based on the needs of target species.

- Michelle said CPW is in the process of pulling together a lot of GPS collar data and looking at movements. She thinks there may be some elk data they could pass along. Julia will follow up with Michelle to see if there is elk collar data available for review.

Julia said the highway is a major barrier so there may not be a lot of crossings but it would be interesting to see where animals are approaching the highway.

- There are moose concentration areas along Clear Creek and Herman Gulch. With the growth in the moose population, WVCs are likely to increase.

Mountain goat

- Habitat is present both north and south of the highway in the high alpine areas. There might be movement across the land bridge over the tunnels.

Black bear and mountain lion are also present throughout the area.

Big horn sheep

- The Georgetown big horn sheep herd primarily moves along the north side of the interstate, all the way up to EJMT and often use the south facing slopes to access early spring vegetation. They are attracted to the road shoulder salts with the concentration of deicing minerals. The project area is not the highest mortality area for big horn sheep but collisions still happen. CPW has identified a movement corridor between the Georgetown population to the north and the Clear Creek herd to the south.
- Michelle said the CPW roadkill app may have some more current bighorn sheep mortality data. Joe said he maintains a spreadsheet of bighorn sheep, black bear, mountain lion, and moose roadkill; he will send this to Julia.

Wildlife-Vehicle Collisions

- Between 2016 and 2020, WVCs were only 4% of all reported crashes in the project area, including three human injury crashes and 11 property damage-only crashes that involved mule deer, elk, moose, black bear and a mountain lion. The percentages can be deceptive because WVCs are still occurring despite very high traffic volumes that discourage wildlife from attempting to cross the interstate.
- CDOT carcass reports complement the crash data throughout the project area. Moose carcasses were reported more in the western part of the project area, and the other species were a little more evenly distributed throughout the project area.

Aquatic Connectivity

- Clear Creek, which runs on the south side of the interstate, is a high value fishery. It is stocked. There are no connectivity or dewatering issues for fish species in Clear Creek itself. The objective would be to avoid impacts to water quality and aquatic habitat, in particular, mag chloride runoff.



- There are three gulches that are bisected by the interstate and have culverts under the Interstate:
 - Dry Gulch, MP 217.4, and Herman Gulch, MP 218.5, both have populations of recently reintroduced greenback cutthroat trout, a federally protected species. The CDOT culverts under I-70 act as a management barrier, keeping non-native fish from the main stem of Clear Creek out of these headwater streams, and that is something the project will need to maintain.
 - Watrous Gulch, MP 219.3, also has a small culvert, which acts as an in-stream barrier. The group confirmed that aquatic connectivity is not necessary here and the intent should be to maintain the existing conditions.

5. Mitigation Objectives and Considerations

Objectives:

- Restore connectivity for terrestrial wildlife across this section of I-70 through Arapaho Roosevelt National Forest with long-term connectivity under shifting habitat and climate conditions.
- Avoiding or minimizing additional impacts to Threatened or Endangered species in the corridor through mitigation by improving habitat connectivity and reducing wildlife-vehicle collisions.
- Reduce incidence of wildlife-vehicle collisions and improving driver safety.
- Maintain aquatic connectivity conditions including in-stream barriers for greenback cutthroat trout

Considerations:

There are a number of limiting circumstances that we have to work around and consider, including:

- Terrain: uphill slope on the north side of I-70; downhill slope on the south side
- Chain Stations: Project will add/expand westbound chain stations
- Clear Creek runs along the south side of I-70, with little room between the interstate and the creek in some places
- Recreation: Paved bike paths run along the south side of Clear Creek which receive summer and winter use.
- Recreation: Heavy summer and winter recreation activity at Herman Gulch Trailhead, Bakerville and Dry Gulch

Julia said the potential crossing structural locations were reviewed, which included the ones that were preliminarily identified through the Ecological process. Other opportunities that weren't identified in previous studies were also evaluated A wildlife overpass as well as large



bridge underpass opportunities were evaluated. This wildlife crossing evaluation in the project area considered the following parameters

- Wildlife habitat and activity
- Wildlife-vehicle collisions
- Terrain suitability; north and south side approaches
- Wetland locations
- Recreational impacts
- Compatibility / conflict with other project elements
- Construction feasibility and cost
- AGS alignment

Julia then reviewed challenges and opportunities with regards to constructing an overpass versus underpasses in this project area:

Overpass considerations include:

- Requires chasing grade on the south side of I-70
- Requires a larger structure footprint and would likely cause permanent wetland impacts
- Traffic noise is louder at the structure approaches
- Higher cost
- More difficult to accommodate future roadway expansion or AGS (must incorporate from the outset)

Underpass considerations include:

- Offers a more natural terrain fit, but would require digging out north side approaches
- Necessitates a smaller structure footprint
- Offers a greater ability to avoid wetland impacts during construction and no permanent wetland impacts
- Traffic noise impacts are lower on the south-side because the approach is below road grade
- An underpass design would include 2 side-by-side bridges with a median opening
- Easier to expand bridge structures in the future once additional lanes or AGS needs are determined



- Lower cost

Julia remarked that in her opinion, underpass structures would offer greater benefits and are more feasible to construct with fewer impacts. She said that in the five-mile-long segment two locations rose to the top:

- MP 217.3 - west side of Dry Gulch: a 100'W x 150'L bridge underpass
- MP 220.1 - Kearney Gulch, west of Bakerville: a 100'W x 150'L bridge underpass. This location requires coordination with westbound chain station expansion.

Wildlife-exclusion fence would likely extend from the Loveland Exit to the Bakerville Exit and incorporate the Herman Gulch interchange into the fencing. Wildlife could also use this roadway bridge to cross under I-70.

- Michelle said when animals approach a more traditional culvert underpass, they can be spooked or run away when vehicles go over the underpass. "Are you thinking about putting dirt in between the decking and the roadway for the road surface and insulation?"

Julia replied no. While steel bridges can be quite loud and reverberate, traffic noises are muted under concrete bridges, such as on I-25 south of Castle Rock.

- Joe asked about the western fence endpoint and asked about running the fence further west up around the top of the tunnel. That way it would be connected into the giant land bridge that goes over the tunnels. He said that moose sometimes attempt to cross around Loveland Valley, though he also noted that extending the fence could be complicated by the interchange and ski area access.

Julia said the fence extent was only preliminary and extending the western end could be considered.

- Kristen asked about the access road near Dry Gulch. This is a Forest Service Road and is gated at the bottom. Joe said Loveland Ski Area uses this road to access a maintenance storage area.
- Julia noted that Loveland has expanded their snowcat operations into the very upper parts of Dry Gulch that could increase some skier activity but the snowcats are much higher up and are not using that road.

Wildlife Fencing Considerations

Fence Design:

- Wildlife guards needed at Herman Gulch interchange (8)
- Escape ramps (4/mile on alternating sides of I-70)
- Aesthetic considerations
- Maintenance / snow plowing



- Gates - provide hunting / recreation access in key locations to hopefully prevent cutting of fence

Issues:

- Steep slopes on south side of I-70
- Debris run at MP 219.3: Run fence over the top of the culvert at this location to avoid maintenance impacts to fence
- Avalanche slide path at MP 217.8: Position fence on highway side of avalanche berm and install braces on either side of fence path to reduce the length of fence that will need to be replaced when an avalanche reaches the highway (~every 10 years)

Additional Mitigation Considerations:

- Limit nighttime work during construction
- Install downward pointing lighting and habitat-side shading at interchanges and chain-up stations
- Chain station should only be lit when chain law is in effect

6. Next Steps, Schedule, and Action Items

Mandy said the team is moving forward with design elements on parallel paths. The wildlife crossings are a bit farther along than the rest of the design, but we don't have current survey data, which is affecting all of the design. Terrain data could affect the crossings as well''.

The team is'' working on design concepts for the major elements of the project such as the alignment of the auxiliary lane; whether we're going to go north into the mountainside, into the median, or a combination of both; and what happens with the chain stations. Once survey data are available, these concepts will be refined.

The team has tried to be proactive with the wildlife crossing location selection to think about where conflicts are going to be. We're looking at getting the general design around the beginning of the year and we will have some concepts that we will work through with the Technical Team and then we'll go into some sort of NEPA. It has not been determined if we will do an environmental assessment or categorical exclusion. The plan is to finish' the NEPA phase by the end of 2023 or the beginning of 2024.

One of the other goals of the project design is to identify a delivery method. Currently 'construction funding has not been identified or secured for the project'. We do have money for design so we'd like to get something that is ready for construction and, potentially if we are going to do some sort of alternate delivery, that could change the level of design. So those are some of the considerations for the next year.

There are some other potential sources of funding that could be advanced outside of the rest of the project. We're keeping those on the forefront of our design considerations. We have



the ability to take some elements of the project into different packages, particularly if we want to do an alternate delivery and that could be a way to advance portions of the project even if we don't have funding for the whole project.

- Brian Dabling (FHWA) said an alternative contract delivery method, such as CMGC, has been used by CDOT in the past when construction funding is not fully identified. However, the way that the regulation reads specific to CMGC is that the total cost of the project has to be known prior to construction and authorization of the first package. This hasn't been well enforced but needs to be considered.

Mandy clarified that identifying a project delivery selection does not mean that CDOT will move into a procurement. But knowing the delivery method does influence the design and the level of design details will help with the total cost estimate.

- Stephanie Gibson (FHWA) noted that the FHWA cannot approve NEPA documents until construction is funded.

Mandy thanked Michelle, Joe, and others for offering to send reports and data to her and asked if there are any comments about the locations, the type of crossing or anything else, we should be thinking of.

- Consider the additional data that CPW brought up if it's helpful.
- While we may not have a crossing specific to the boreal toad, Julia said the I-25 Gap project specifically included habitat features for small fauna through the larger underpasses, and we would do the same thing here.
- Paige asked whether we'd need to provide cover for lynx in the crossings?

Julia replied that lynx will cross open areas. Suitable cover in the approaches to the structure is important for wildlife. Vegetation isn't going to grow under the bridges due to shading. However, we could place some downed logs or other habitat connectivity features, such as brush windrows in the structure.



COLORADO

Department of Transportation

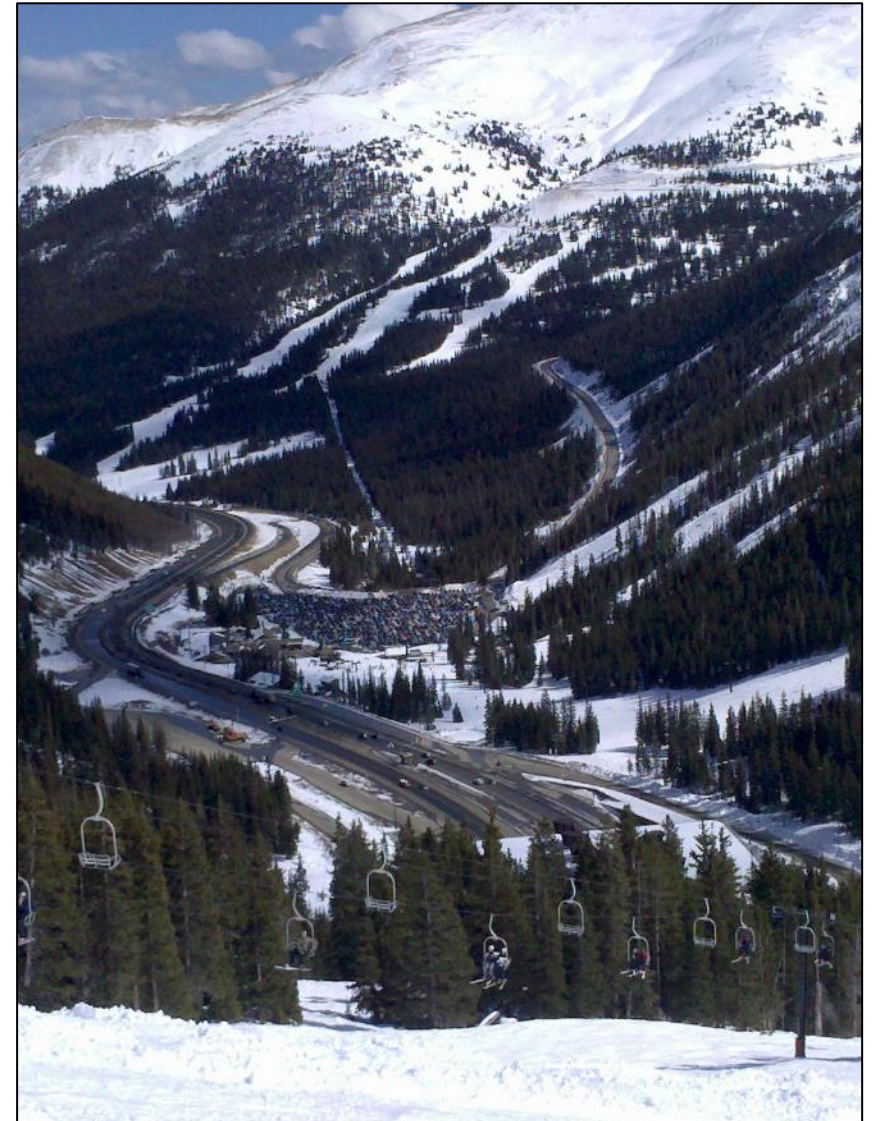
Westbound Bakerville to EJMT Auxiliary Lane

ALIVE ITF Meeting #1

November 7, 2022



- Welcome, Introductions, and Meeting Purpose
- Project Overview / Purpose and Need
- ALIVE MOU, Previous Studies, & Commitments
- Wildlife Issues & Concerns
- Mitigation Objectives & Considerations
- Next Steps





Introductions

- Name
- Role
- Fun question from Mandy

Meeting Purpose

- Provide ALIVE ITF members with an understanding of the project
- Receive feedback on critical issues, data sources, concerns and opportunities, and additional considerations
- Endorse overarching mitigation goals and outcomes





Tier 1 Auxiliary Lanes, Specific Highway Improvement

- Improve safety
- Improve mobility
- Decrease congestion



Tier 2 Project-Specific Purpose and Need

- Safety Concerns
 - crash reduction
- Operational Issues
 - Speed differentials
 - Travel time
 - Unreliability
 - Freight operations, including chain stations
 - High number of incident closures



“Specific highway improvement” approved in I-70 Mountain Corridor PEIS ROD

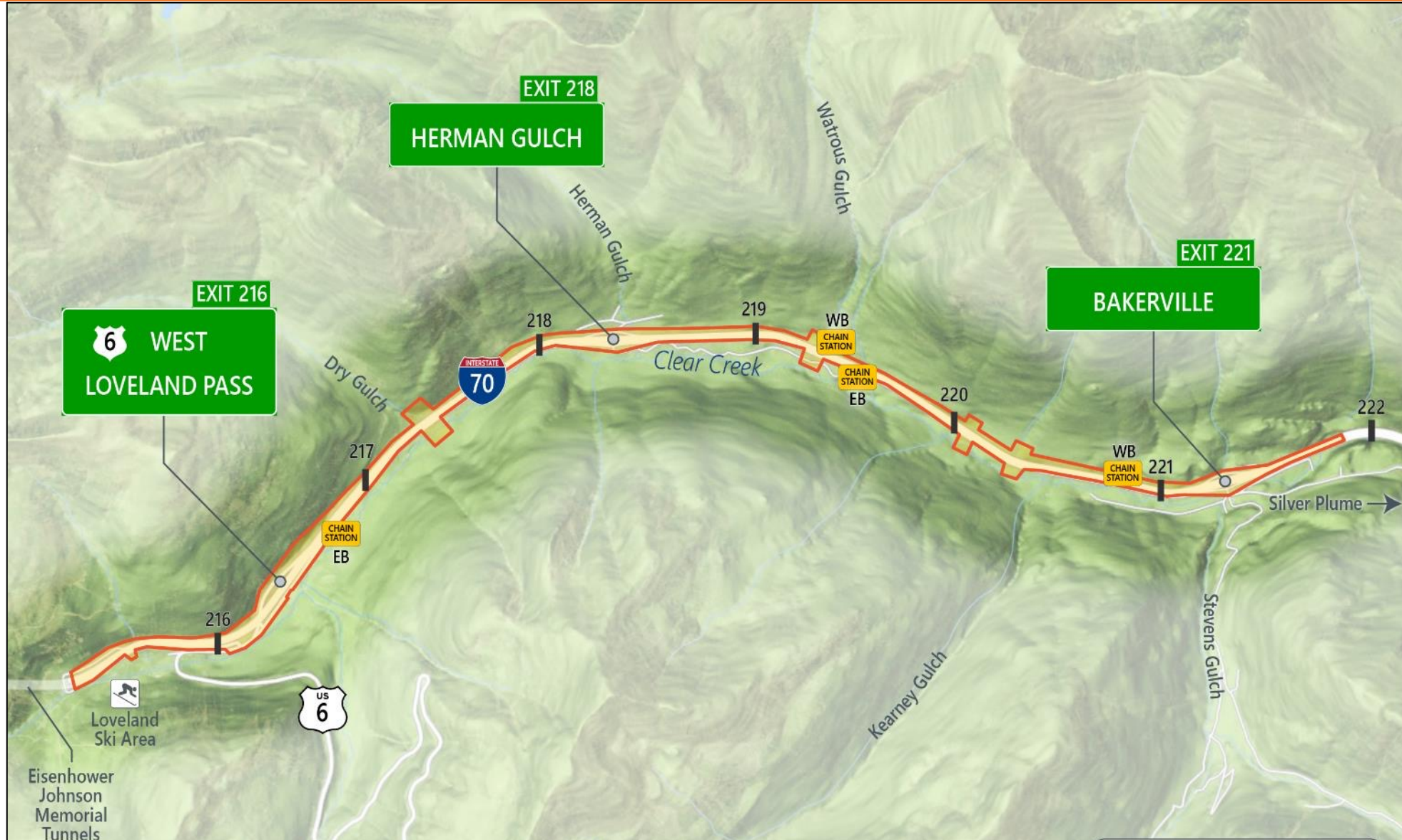
- Westbound auxiliary (climbing lane)
from Bakerville to EJMT
 - Would become third lane in Maximum
Program
- Loveland interchange
- Chain up stations
- Wildlife crossing mitigation



Westbound auxiliary lane from Bakerville to the Eisenhower-Johnson Memorial Tunnels identified as a high priority component of the PEIS Preferred Alternative because it “improves mobility, enhances safety, and has public support.”



Project Location





Purpose

- Reduce wildlife-vehicle collisions (WVCs)
- Increase permeability of the I-70 Mountain Corridor for wildlife
- Streamline interagency coordination

Intent

- Ensure wildlife passage and decrease wildlife-vehicle collisions in identified Linkage Interference Zones (LIZs)
- Ensure agencies' full cooperation in early and full implementation of corrective actions to solve permeability problems in identified LIZs

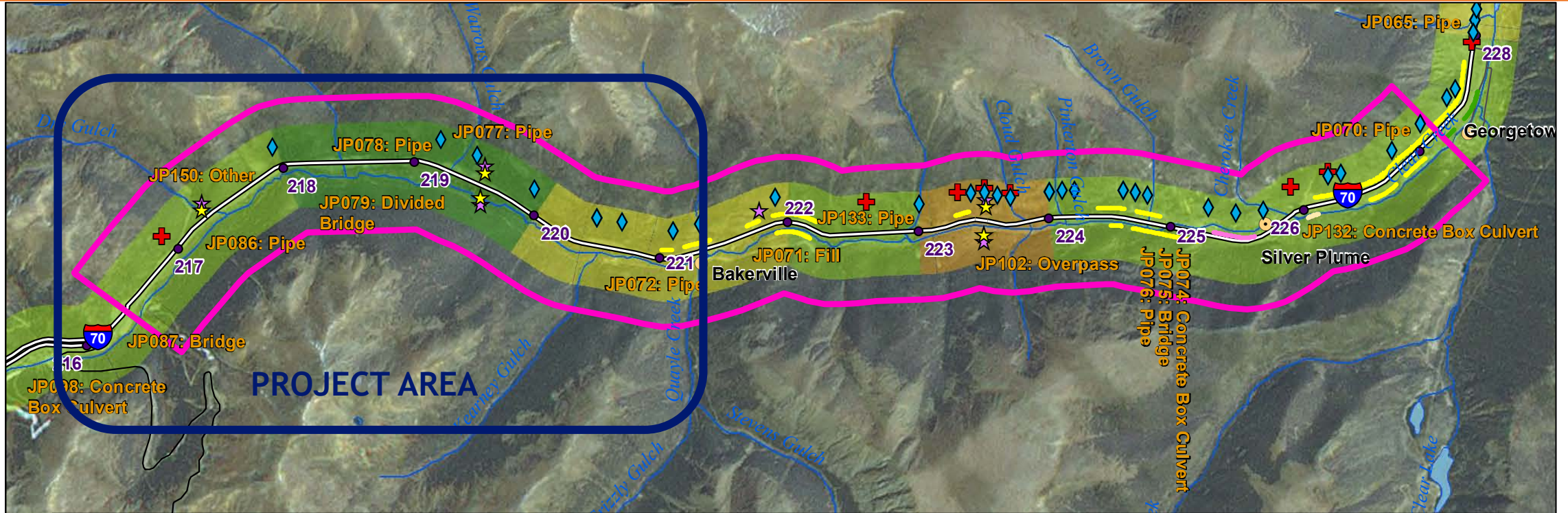
The original ALIVE Committee identified 13 LIZs along the Corridor



I-70 Ecological Framework (2011)

A Regional Ecosystem Framework for Terrestrial and Aquatic Wildlife along the I-70 Mountain Corridor

- Objective:
 - Create a standardized and transparent process for assessing WVC reduction and wildlife permeability needs in the corridor
- Outcomes:
 - Identification of 17 Linkage Interference Zones (2011)
 - ALIVE Implementation Matrix
 - Guidelines and best practices for improving aquatic and terrestrial connectivity



Legend

Linkage Interference Zones - 2011	Wildlife Fencing	Roadside barrier	Median barrier	City
2009 Camera Monitoring Location	AVCs Summed per Mile (CSP 1993-2006)	Downslope natural barrier	Downslope median retaining wall	Mile Post
2010 Camera Monitoring Location	0	Downslope retaining wall	Downslope median sound wall	Interstate
Inventory Location	1- 4	Tunnel	Upslope median retaining wall	Highway
New Crossing Recommendation	5 - 7	Upslope natural barrier		Local Road
I-70 Wildlife Watch Observations	8 - 11	Upslope retaining wall		Stream
Alive	12 - 20	Upslope sound wall		Lake
Dead	21 - 92	Upslope natural barrier and upslope retaining wall		
		Upslope natural barrier and downslope retaining wall		

0 1 2 Miles

ROCKY MOUNTAIN WILD

Map created by Rocky Mountain Wild August 5, 2011
Sources: ALIVE, CDOT, CSP, ESRI, RMW, USGS, WTI



LIZ Extent: mileposts 216.4-227.1 (Loveland Exit to Bakerville)

- Project Area: mileposts 216-221.3
- Target Species
 - Primary: Canada lynx
 - Secondary: Bighorn sheep, Black bear, boreal toad, elk, mountain lion, mule deer, northern leopard frog
- Project Area portion of the LIZ is entirely within the National Forest
- Preliminary recommendations for wildlife underpasses and overpasses





I-70 Traffic and Revenue Study

- Initiated in 2013 to explore solutions to congestion on the I-70 Mountain Corridor
 - Initial evaluation of roadway design alternatives between Golden and Silverthorne
 - Study terminated in 2014
- ALIVE Committee revisited recommendations from the EcoLogical Study:
 - Reviewed previously identified crossing structure recommendations (structure type and dimensions); did not evaluate new locations for wildlife crossings
 - High-level mitigation costs



I-70 Crossings Review for the Floyd Hill Project

'Best Mitigation in the Best Place'

- I-70 Floyd Hill Project Environmental Assessment (2020-2021)
- Development of an alternative mitigation package outside of project boundaries to compensate for impacts of the Floyd Hill project
 - Review of wildlife crossing needs on I-70 in Region 1, including:
 - Dry Gulch (MP 217.4)
 - Kearny Gulch (MP 220.5)

High biological and connectivity values, but not prioritized for stand-alone mitigation

- Floyd Hill commitment to wildlife crossings
 - Floyd Hill Early Projects: Underpass on I-70 near Genesee; Bighorn sheep overpass on US 40 near Empire



Wildlife Issues:

- Threatened and Endangered Species
 - Canada lynx
 - Boreal toad
- Connectivity for terrestrial wildlife
- Wildlife-vehicle conflict
- Aquatic connectivity

Identify:

- Initial list of concerns regarding these wildlife issues
- Information and data needs
- Opportunities and challenges of integrating mitigation needs with other project components



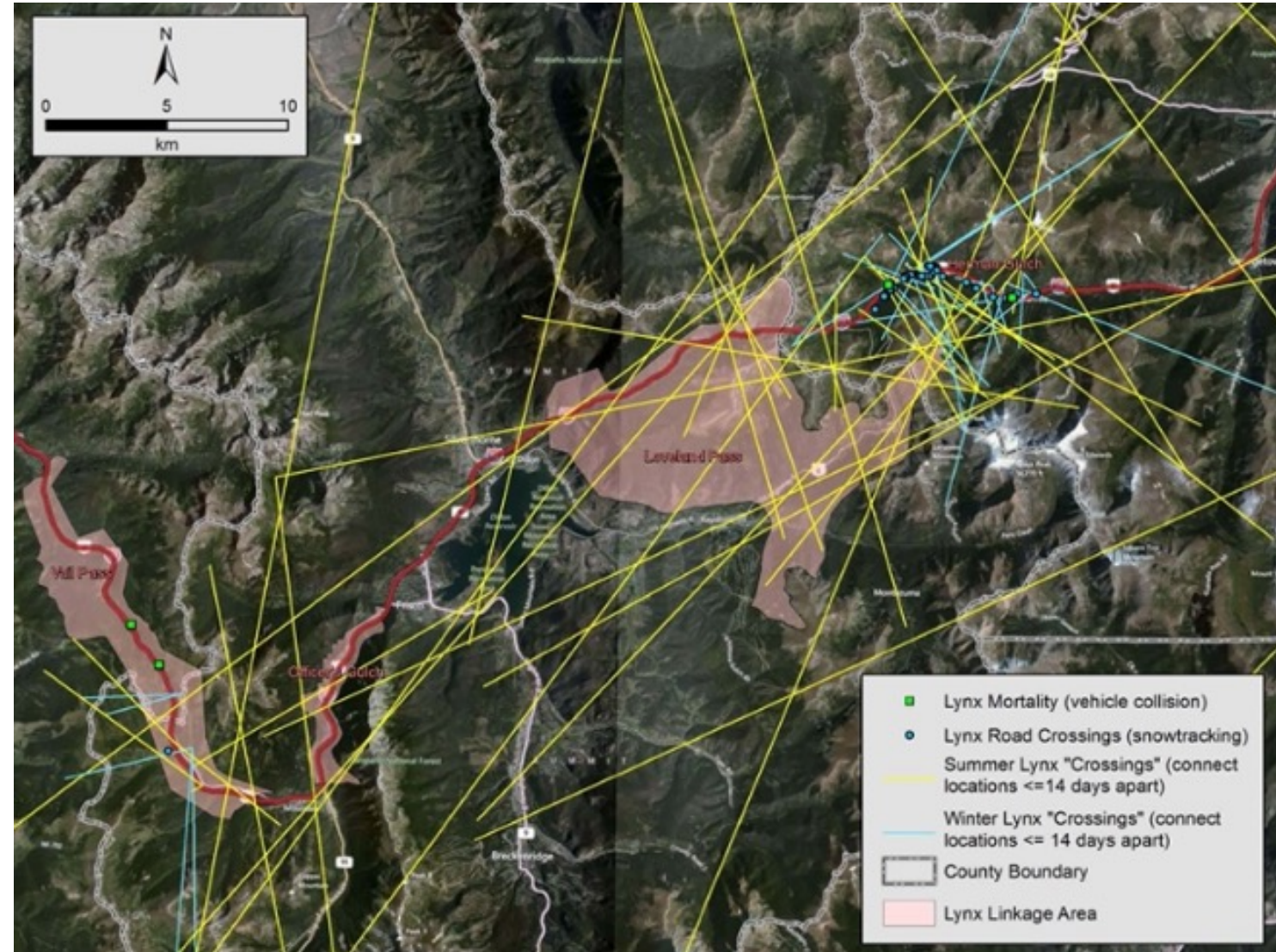
- Potential habitat
- High probability of lynx highway crossing (Baigas et al. 2017)
- Wildlife-vehicle collisions
 - Recorded mortalities:
 - Aug. 2000 - MP 220.9
 - May 2005 - MP 217.3
- Barriers to movement:
 - Expanded highway footprint and increased traffic volumes
 - Median and shoulder barriers; new rock cuts
 - Lighting at interchanges, chain stations, and signage
- Cumulative impacts to lynx habitat and movement





Ivan 2012 (CPW):

- Straight-line approximations of road crossings by Canada lynx based on telemetry data, 1999-2010 (indication of broad movement areas)
- I-70 road crossings confirmed by winter snow tracking (this area was heavily surveyed based on telemetry locations)





- Project may result in a ‘likely to adversely affect’ determination per Section 7 of the Endangered Species Act, requiring mitigation/conservation measures.
 - Restoring connectivity across I-70 would improve lynx access to habitat, dispersal ability, and avoid potential vehicle-caused mortality
 - Consider summer and winter recreation impacts to lynx habitat and activity





- Historic Breeding sites:
 - MP 217.9
 - MP 218.7
 - MP 220.8
- Connectivity needs for boreal toad across I-70 unspecified
 - Accommodate boreal toad passage into crossing structure designs
 - Need for specialized culverts near breeding ponds?





Project Effects:

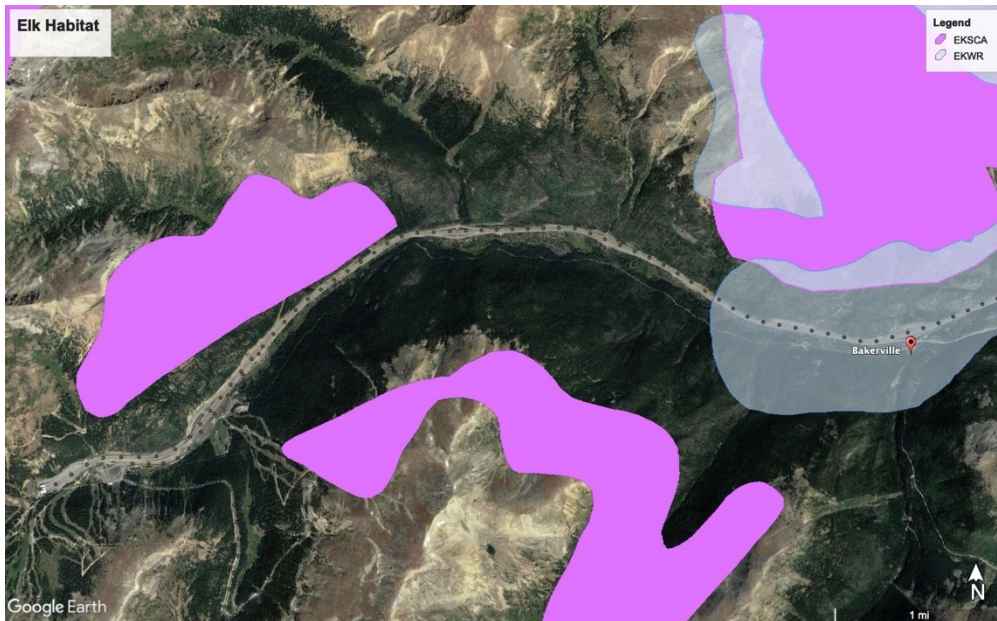
- Habitat loss due to expanded highway footprint (some widening will be into median)
 - Highway widening, chain stations
- Increase in barrier effect
 - Increased number of traffic lanes
 - Increasing traffic volumes
 - Median and shoulder barriers
 - Lighting at interchanges, chain stations, and signage
- Potential increase in wildlife-vehicle collisions





Elk

- Summer range and summer concentration areas
- Severe winter range around Bakerville



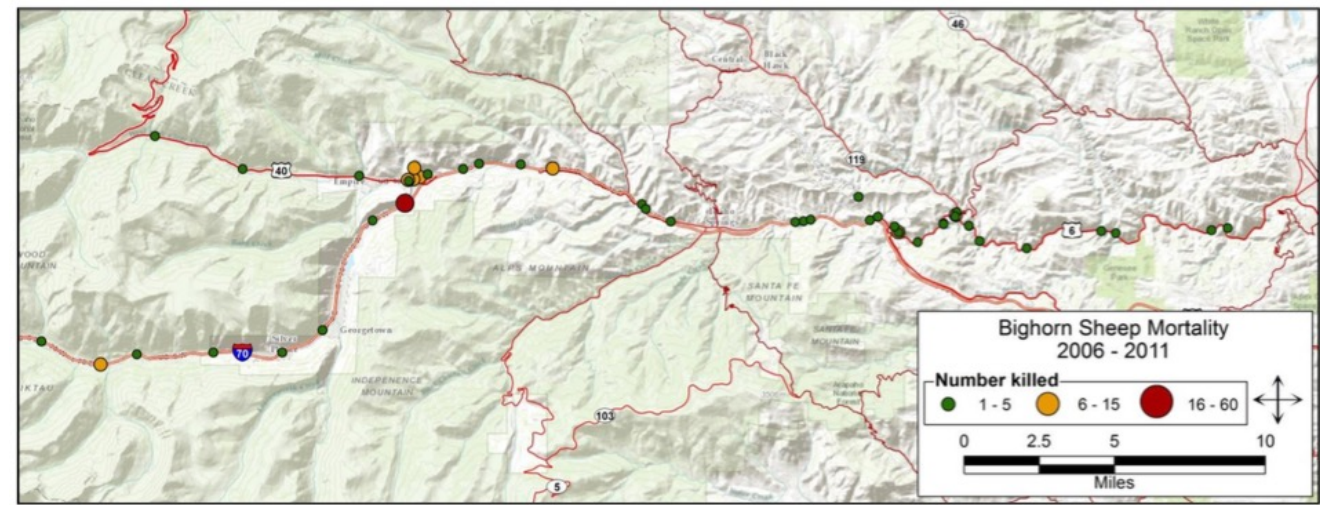
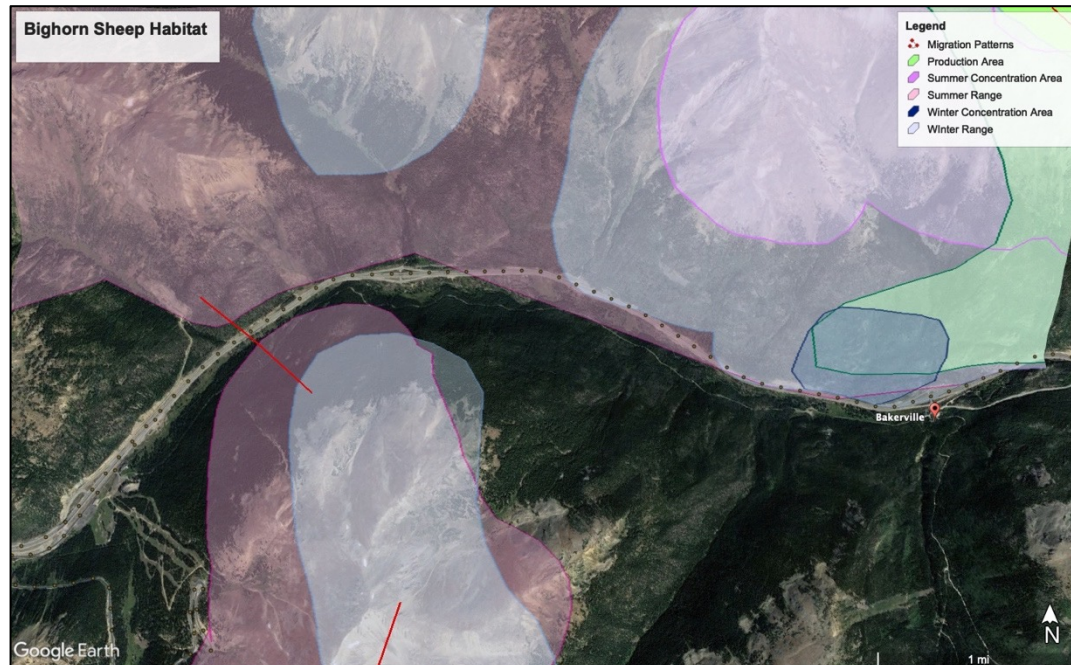
Other Species:

- Mule deer summer range
 - Bighorn sheep summer and winter range
 - Moose concentration and migration along Herman Gunch and Clear Creek
 - Mountain goat - high alpine areas north and south of I-70
 - Black bear overall range
 - Mountain lion overall range
- Consider potential future shifts in habitat and movement patterns



Bighorn Sheep

- De-icing minerals and spring green-up act as attractants to road shoulders
- WVC mortality generally low in project areas
- Connectivity between populations on the north (Georgetown herd) and south (South Clear Creek herd) sides of I-70



Bighorn Sheep I-70 WVC mortalities, 2006-2011 (Huer 2015)



Wildlife-vehicle collisions (WVC) are relatively uncommon (4% of all reported crashes). Yet, WVC continue to occur despite very high traffic volumes

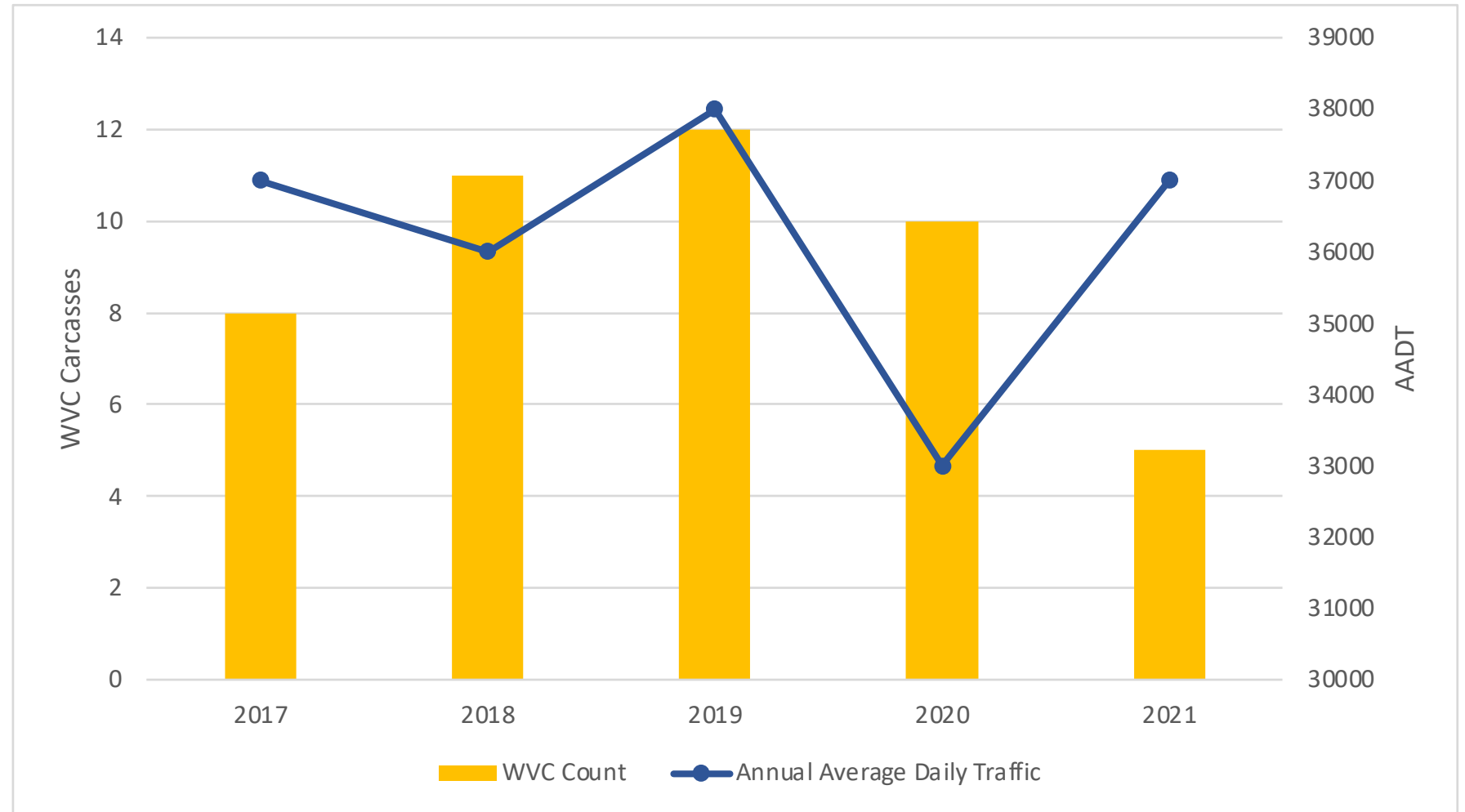
- Over a five-year period (2016-2020), WVC crashes:
 - Resulted in 3 (human) injury crashes and 11 property damage only crashes
 - Involved mule deer (6), elk (3), moose (2), black bear (1), and mountain lion (1)

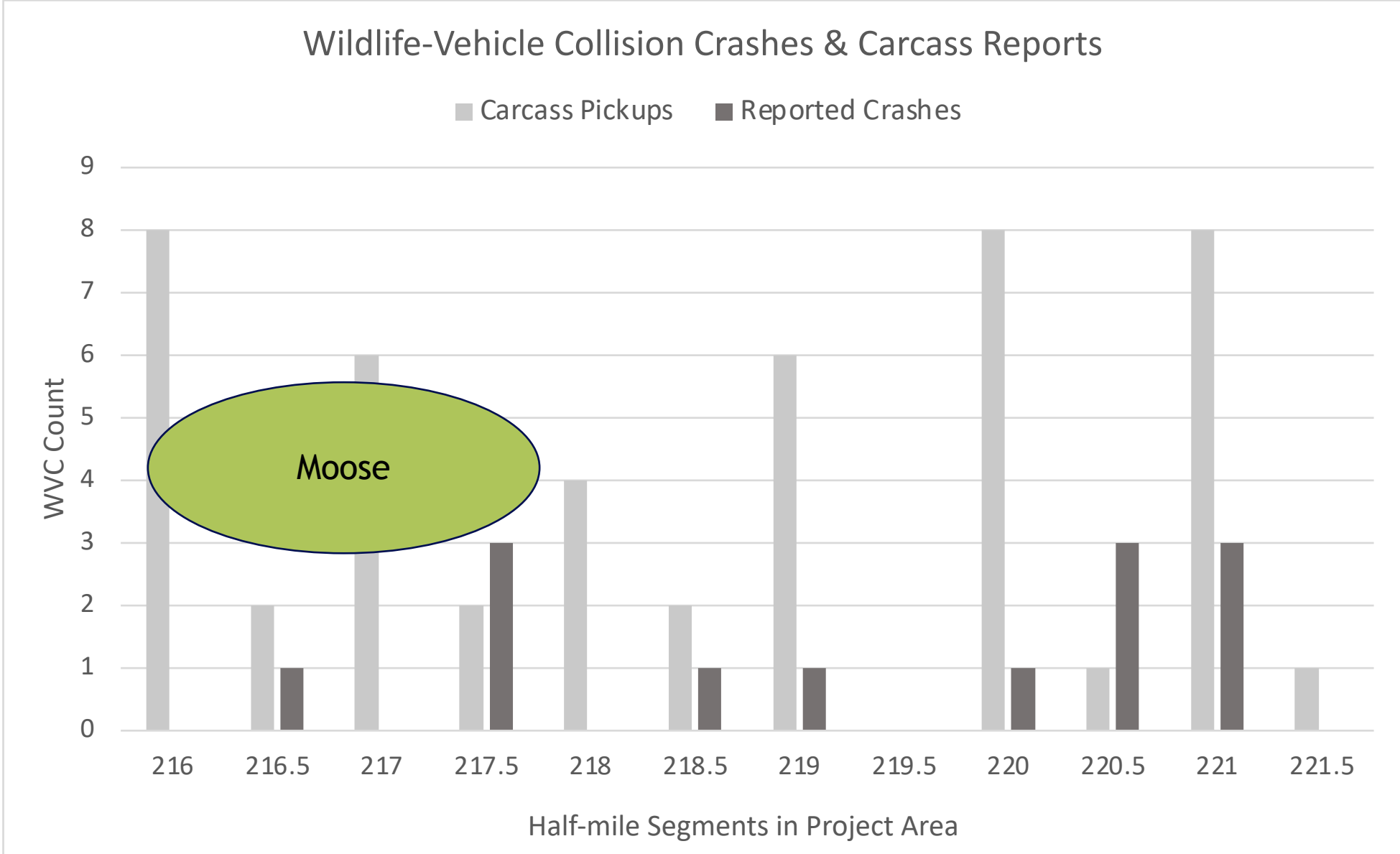




46 WVC carcasses reported over 5 years:

- Mule deer (21)
- Elk (8)
- Black bear (4)
- Moose (1)
- Coyote (1)
- Mountain lion (1)
- Red fox (1)
- Unknown (8)







- Clear Creek - south side of I-70
 - High-value fishery - creek is stocked
 - No connectivity or dewatering issues for native fish species
 - Maintain conditions and avoid project impacts to creek
- Dry Gulch - MP 217.4
 - Maintain instream barrier to keep headwaters population of greenback cutthroat trout (GBCT) separate from Clear Creek
- Herman Gulch - MP 218.5
 - Connectivity objective?
- Watrous Gulch - MP 219.3
 - Existing corrugated metal pipe (6' diameter x 195' long)
 - Gulch runs under chain station
 - Connectivity objective?





- *Restore connectivity* for terrestrial wildlife across this section of I-70 through the Arapaho Roosevelt National Forest
 - Long-term connectivity under shifting habitat and climate conditions
- Avoid / minimize additional impacts to *T&E species*
 - Mitigate impacts by improving habitat connectivity and reducing wildlife-vehicle conflict
- Reduce incidence of *wildlife-vehicle collisions* and improve driver safety
- Maintain aquatic connectivity conditions, including in-stream barriers for GBCT





- **Multiple Limiting Circumstances**

- *Terrain*: uphill slope on north side of I-70; downhill slope on south side
- *Chain Stations*: Project will add/expand westbound chain stations
- *Clear Creek*: runs along the south side of I-70, with little room between the interstate and the creek in some places
- *Recreation*: Paved bike path runs along the south side of Clear Creek
- *Recreation*: Heavy recreation activity at Herman Gulch Trailhead; also at Bakerville and Dry Gulch





Reviewed 4 potential overpass locations and 4 underpass locations

Evaluate:

- Wildlife habitat and activity
- Wildlife-vehicle collisions
- Terrain suitability; north and south side approaches
- Wetlands
- Recreation impacts
- Compatibility / conflict with other project elements
- Construction feasibility and cost
- AGS alignment



Overpasses

- Chasing grade on south side of I-70
- Larger structure footprint and would likely cause permanent wetland impacts
- Traffic noise louder at structure approaches
- Higher cost
- More difficult to accommodate future roadway expansion or AGS (must incorporate from outset)

Underpasses

- More natural terrain fit, but would require digging out north side approaches
- Smaller structure footprint
- Greater ability to avoid wetland impacts during construction; no permanent wetland impacts
- Traffic noise impacts lower on south side because approach is below road grade
- Underpass design would include 2 bridge spans with a median opening
- Easier to expand bridge structures in the future once additional lanes or AGS needs determined



5-mile-long segment through National Forest:

- MP 217.3 - west side of Dry Gulch
 - 100'W x 150'L bridge underpass
- MP 220.1 - Kearney Gulch, west of Bakerville
 - 100'W x 150'L bridge underpass
 - Coordinate with westbound chain station expansion
- Extend fence from Loveland Exit to Bakerville Exit
- Incorporate Herman Gulch interchange into fencing; wildlife could also use this roadway bridge to cross I-70





Recommended Wildlife Mitigation



Wildlife Underpass

Interchange Bridge

Wildlife Underpass

Fence Ends

Bakerville





- Fence Design

- Wildlife guards needed at Herman Gulch interchange (8)
- Escape ramps (4/mile on alternating sides of I-70)
- Aesthetic considerations
- Maintenance / snow plowing
- Gates - provide hunting / recreation access in key locations

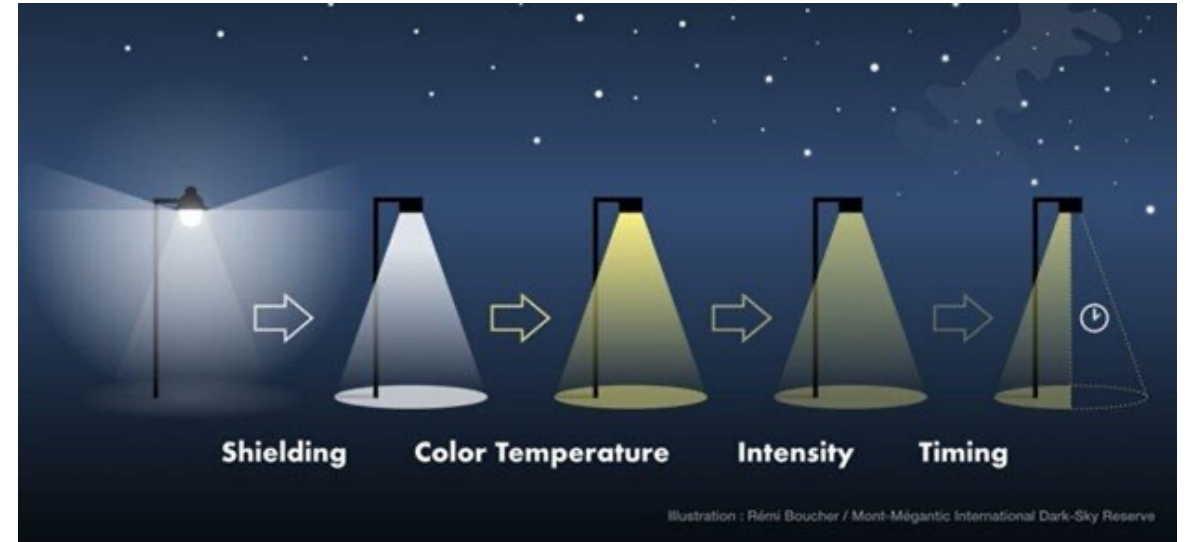
- Issues:

- Steep slopes on south side of I-70
- Debris run at MP 219.3
 - Run fence over the top of the culvert at this location to avoid maintenance impacts to fence
- Avalanche slide path at MP 217.8
 - Position fence on highway side of avalanche berm
 - Install braces on either side of fence path to reduce the length of fence that will need to be replaced when an avalanche reaches the highway (~every 10 years)



Minimize impacts to Canada lynx

- Limit nighttime work during construction
- Install downward pointing lighting and habitat-side shading at interchanges and chain-up stations
 - Chain station should only be lit when chain law is in effect





EVALUATION CRITERIA AND DESIGN OPTION DEVELOPMENT			PROJECT INITIATION AND GOALS			ENVIRONMENTAL IMPACT ANALYSIS			NEPA DOCUMENTATION			AGENCY / PUBLIC REVIEW			PROJECT APPROVAL			FINALIZE PROJECT		
<ul style="list-style-type: none"> Context and Core Values Project Charter Project Work Plan Environmental Field Surveys 			<ul style="list-style-type: none"> Development of Purpose and Need Existing Conditions Critical Issues Initiation of Issue Task Forces Initial Development of Alignment Options Alternatives Screening Matrix 			<ul style="list-style-type: none"> Identification of Environmental Impacts Identification of Mitigation Strategies Public Open House Final Technical Reports 			<ul style="list-style-type: none"> Draft NEPA Document 			<ul style="list-style-type: none"> Public Open House / Public Review Final NEPA Document 			<ul style="list-style-type: none"> Draft Decision Document 			<ul style="list-style-type: none"> Final Decision Document 		
Q3 2022			Q4 2022			Q1 2023			Q2 2023			Q3 2023			Q4 2023			Q1 2024		
JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
Define Desired Outcomes		Endorse Process			Establish Criteria	Develop Alternatives or Options						Evaluate, Select, and Refine Alternatives or Options			Finalize Documentation and Progress					



Action Items

