

I-70 Early Enhancement Opportunities

Early Enhancement Opportunities in the I-70 Mountain Corridor

Terrestrial Connectivity Opportunities

The following Early Enhancement Opportunities may be implemented outside of projects to improve terrestrial wildlife passage in LIZs-2011. For sites where the Early Enhancement Opportunity is listed as a 'Minimum Recommendation', these should be considered alternatives that can be implemented immediately if the Preferred Recommendation cannot be implemented until sometime in the future. For complete site descriptions and recommendations see the document *I-70 Connectivity Recommendations* available on the I-70 Mountain Corridor CSS website.

Milepost	Loc. #	LIZ-2011	Early Enhancement Opportunity
152.6	JP126	B: Wolcott West	Move wildlife fencing to run over the top of the pipe rather than running in front of structure entrances. Add small mammal fencing to connect structures under EB and WB lanes through open median. Remove accumulated sediment limiting through-passage.
154.0	JP116	B: Wolcott West	Divided bridge. Widen and improve dry pathway between river and Hwy 6 on east side of structure by moving guardrail closer to road and maintaining a dirt/gravel pathway through large boulders lining the river bank. Replace or cover gabian wall abutment with natural substrate. Implement measures to minimize human activity on north side of Eagle River to encourage wildlife use.
158.7	JP114	D: Wolcott East	Divided bridge. Replace concrete abutments with natural slopes. Connect existing wildlife fencing completely to structure so that there are no gaps. Traffic on Hwy 6 may preclude some wildlife movement, but large span offers large area for wildlife to traverse. Minimize human access on non-roaded side of river to encourage wildlife passage.
170	JP048	E: Dowds Junction	Minimum Recommendation: Remove & restore dirt parking area in front of south entrance of box culvert and prevent cars/trucks from driving through the structure. Divert trail users to park on the north end of the structure. Add sediment baffles and maintain sediment pathway through the structure. Restore vegetation around south side entrance and add wildlife crossing warning signs and rumble strips to Hwy 6 at the north entrance. Animals are naturally funneled below the hwy level at this location; fencing may not be necessary, although this question requires further investigation. In lieu of fencing, consider adding a concrete shoulder barrier to the north side of the highway, extending beyond where the drainage reaches the same level as the roadway.

I-70 Early Enhancement Opportunities

Milepost	Loc. #	LIZ-2011	Early Enhancement Opportunity
171.1	JP047	E: Dowds Junction	Construct dry, flat pathways (>3' wide) through the riprap slopes on both sides of the river and connecting to the adjacent habitat. Restore natural stream banks through the structure and leading under the adjacent bridge to north.
171.3	JP046	E: Dowds Junction	Minimum Recommendation: Construct dry, flat pathways (≥3' wide) through the riprap abutments on both sides of the river connecting to adjacent habitat.
177.4	JP149	F: Vail (East)	Open up bridge and naturalize side slopes; add dirt or vegetated pathway. Sign at-grade crossing over parallel frontage road (stop signs at intersection keep traffic speeds low at this location)
182	JP063	G: Gore Creek	Concentrate human activity immediately around paved access road at west end of bridge and implement measures to minimize human activity beneath the rest of the structure. Restore dirt lot/road with native vegetation cover. Requires coordination with local community and user groups to implement effective control measures and to educate the public on the importance of segregated wildlife/human uses at this location.
183.0	JP061	H: West Vail Pass	Remove culvert and restore stream channel through bridge structure. Complement structure with guide fencing to direct animals toward structure and discourage at-grade crossings. If the roadway footprint increases with future highway reconstruction, the span and height of the bridge should also be increased to compensate for the additional length that animals must travel under the bridge.
184.0	JP096	H: West Vail Pass	Structure is highly functional for target species. Maintain connectivity at site. Complement structure with guide fencing to direct animals toward structure and discourage at-grade crossings.
184.5	JP060	H: West Vail Pass	Structure is highly functional for target species. Maintain connectivity at site. Complement structure with guide fencing to direct animals toward structure and discourage at-grade crossings.
185.0	JP059	H: West Vail Pass	Structure is highly functional for target species. Maintain connectivity at site. Complement structure with guide fencing to direct animals toward structure and discourage at-grade crossings.
185.5	JP058	H: West Vail Pass	Structure is highly functional for target species. Maintain connectivity at site. Complement structure with guide fencing to direct animals toward structure and discourage at-grade crossings.
218.5	JP079	M: Bakerville	Improve wildlife passage at existing bridge structure by opening up a natural substrate pathway adjacent to the roadway to encourage nighttime use of the structure. Add signage to inform drivers of potential wildlife activity (interchange traffic is slow moving and required to stop around this structure).

I-70 Early Enhancement Opportunities

Milepost	Loc. #	LIZ-2011	Early Enhancement Opportunity
225.0	JP075	M: Bakerville	Open up and naturalize side slopes and road shoulders to encourage nighttime wildlife use.
223.5	JP102	M: Bakerville	Convert one lane of the bridge to vegetative grass/shrub cover. Investigate adding an at-grade wildlife crosswalk over Highway 6 at this location or other mechanisms to slow traffic and make drivers aware of potential wildlife crossing. Install guide fencing to direct animals away from the highway and towards the structure.
249.0	JP041	P: Beaver Brook	Minimum recommendation: open up riprap side slopes of bridge structure and restore vegetative cover along edges of road. Ultimately, replace structure with a more expansive bridge also spanning Soda Creek and restore riparian zone through structure (JP041). Add wildlife fencing (and amphibian walls) to guide animals to structure.
253.4	JP097	Q: Mt Vernon Creek	Minimum recommendation: Set back park fencing and add gates leading to box culvert so that they can be closed when moving the bison herd from one side of the highway to the other and left open for wildlife passage the rest of the time. Discourage cars parking above culvert on south side of interstate for bison viewing - direct all tourist traffic to north side viewing area, away from culvert. Note: adjusting the bison enclosure will allow wildlife access to the culvert, however this culvert is not considered large enough for elk passage. It is possible, though uncertain, that the resident herd could become adapted to it, particularly given the high traffic levels on I-70. Coordinate with Denver Parks on fence design and maintain viewing area on NE side (off exit)

I-70 Early Enhancement Opportunities

Aquatic Connectivity Opportunities

The following Early Enhancement Opportunities may be implemented outside of projects to improve fish passage at targeted road-stream crossings. For sites where the Early Enhancement Opportunity is listed as a 'Minimum Recommendation', these should be considered alternatives that can be implemented immediately if the Preferred Recommendation cannot be implemented until sometime in the future. For complete site descriptions and recommendations see the document *I-70 Connectivity Recommendations* available on the I-70 Mountain Corridor CSS website.

Stream Name	Milepost	Loc. #	Early Enhancement Opportunity
Buck Creek*	164.3	JP138	Build up grade coming into inlet so that water flow doesn't have to 'jump' into culvert. Add substrate inside culvert and secure by constructing baffles or weir plates inside the culvert.
Unknown Tributary to Gore Creek	172.9	JP139	Replace culvert with an oversized box, arch or pipe so that the outlet invert is at the elevation of Gore Creek at low flow. Reroute wildlife fencing so that it does not block culvert inlet.
Buffehr Creek*	174.0	JP095	Improve transition into culvert by creating a step-pool system through culvert, including a low-flow channel. Consider downstream improvements such as rock weirs.
Red Sandstone Creek	175.0	JP094	Add rocky step-pool system through culvert and at inlet to control high water velocities and provide resting areas inside the culvert. Include a low-flow channel in the retrofit design. Ultimately, install a new, larger culvert (e.g., oversized open bottomed pipe) more consistent with the natural stream channel slope and alignment. Restore natural stream channel and maintain natural substrate through the new culvert.
Bighorn Creek*	180.6	JP090	Remove barrier at inlet and allow substrate to fill the bottom of the culvert and restore natural grade into inlet. Ultimately, replace culvert with large 3-sided box, arch, open-bottomed pipe or embedded pipe culvert. Maintain a grade through the culvert that is consistent with upstream and downstream conditions. Construct features to mimic channel conditions through the culvert and improve fish passage. Coordinate with local municipality to ensure continued connectivity through downstream culvert.
Unknown Tributary to Black Gore Creek	183.0	JP135	Remove culvert and restore stream channel under bridge structure at same location (JP061)
Unknown Tributary to Black Gore Creek	183.3	JP134	Install shallow weir plates through culvert to reduce water velocities and add roughness. Ultimately, install a new, larger culvert (e.g., oversized open bottomed pipe) to encompass the channel's bankfull width. Construct features that mimic channel conditions through the culvert and improve fish passage.
Unknown Tributary West Tenmile Creek*	191.2 (EB)	JP030	Repair crushed flared end section at inlet. Install weir plates and add gravel substrate inside culvert; construct step/pool features at outlet.

I-70 Early Enhancement Opportunities

Stream Name	Milepost	Loc. #	Early Enhancement Opportunity
Unknown Tributary West Tenmile Creek*	191.5	JP127	Construct drop/pool structures.
Unknown Tributary to West Tenmile Creek*	192.0	JP032	Install weir plates at inlet and through structure to control flow velocities and retain gravel substrate.
Unknown Tributary to West Tenmile Creek*	193.0 (WB)	JP056	Narrow channel at inlet to create deeper pool and increase flow depth over inlet apron. Coordinate terrestrial and aquatic connectivity needs and, ultimately, remove fill and construct a large bridge or arch underpass. Restore natural hydrologic flow regime.
Salt Lick Gulch*	204.5	JP039	Coordinate with CDOW to determine priority, given lack of connectivity downstream to Blue River at culvert under access road. Construct a series of drop/pools at the outlet to remove drop.
Herman Gulch	218.5	JP078	Minimum recommendation: add weir plates on inlet apron to create drop-pool structure. May add weir plates through structure as well. Maintain step pools at outlet.
Silver Gulch*	228.2	JP065	Remove drop at frontage road by cutting back the culvert and creating a step/pool system. Ultimately, replace and lower the culvert.
Soda Creek*	249.0	JP041	Minimum recommendation: replace with a bottomless culvert and construct step/pool structures to eliminate drops.
Mt Vernon Creek*	256.0	JP001	Reduce the width to depth ratio and install habitat enhancement measures, such as adding weirs at inlet and through culvert to provide velocity control and a low-flow channel through the culvert. Identify water rights holder and determine if water diversion in use; if possible, remove water diversion at outlet.