APPENDIX A13

BIOLOGICAL EVALUATION TECHNICAL MEMORANDUM

APPENDIX A13

BIOLOGICAL EVALUATION TECHNICAL MEMORANDUM

April 2020
By Colorado Wildlife Science, LLC

INTRODUCTION AND BACKGROUND

The I-70 West Vail Pass Auxiliary Lanes project is located in Eagle and Summit counties, with the eastern terminus just east of the Vail Pass Rest Area and the western terminus in the Town of Vail. The project study limits include eastbound (EB) and westbound (WB) I-70 from mile post (MP) 179.5 to MP 191.5. The project location and approximate Study Area are shown in **Figure 1**.

As part of the initial National Environmental Policy Act (NEPA) analysis, a Tier 1 Environmental Impact Statement (EIS) for the I-70 Mountain Corridor (C-470 to Glenwood Springs) was completed in 2011. This EIS, the *I-70 Mountain Corridor Programmatic Final Environmental Impact Statement* (PEIS), recommended the addition of auxiliary lanes EB and WB on the west side of Vail Pass from MP 180 to MP 190 as part of the Preferred Alternative's Minimum Program of Improvements. The PEIS also identified the potential for an elevated Advanced Guideway System (AGS) for transit along the I-70 corridor, including the West Vail Pass project corridor. A follow-up AGS Feasibility Study in 2014 analyzed potential alignments and costs for an AGS system and determined there were three feasible alignments for future AGS. While AGS is not part of the West Vail Pass Auxiliary Lanes project, the AGS Feasibility Study was used to ensure the project did not preclude the favored alignment of the three, which would be partially within CDOT right-of-way (ROW).

A Tier 2 NEPA analysis is the next step required to move highway improvements forward. The project is following the Colorado Department of Transportation (CDOT) and Federal Highway Administration (FHWA) NEPA process to confirm the needs for improvements to West Vail Pass, identify a Proposed Action, investigate the anticipated benefits and impacts of the proposed improvements (through an Environmental Assessment), produce conceptual design plans, and make funding, scheduling, and phasing recommendations.

This Biological Evaluation (BE) evaluates the effects of the I-70 West Vail Pass Auxiliary Lanes (the Proposed Action) and the No Action Alternative with respect to biological resources including United States Forest Service (USFS) sensitive species. The Study Area used in this assessment encompasses the actual limits of disturbance, including areas that would be impacted as a result of construction activities ("Study Area").

LEGISLATION

As part of the environmental review process pursuant to section 206 of the Federal Land Management and Policy Act of 1976, and pursuant to NEPA, this Biological Evaluation was produced to address potential impacts to USFS Rocky Mountain Region (Region 2 or R2) Sensitive Species on the White River National Forest (WRNF), or species that are located adjacent to, or downstream of, the project that could potentially be affected by the Proposed Action. Under USFS Manual 2672.41, the objectives for completing BEs for proposed USFS programs or activities are: (1) to ensure that

USFS actions do not contribute to loss of viability of any native or desired non-native plant or animal species; (2) to ensure that activities do not cause any species to move toward federal listing; and (3) to incorporate concerns for sensitive species throughout the planning process, thus reducing negative impacts to species and enhancing opportunities for proactive conservation. The BE is the means of conducting the review and documenting those findings and to provide recommendations to minimize potential negative effects on sensitive species. This BE evaluates potential effects of the Proposed Action on USFS Region 2 Sensitive aquatic and terrestrial wildlife species and plants.

The list of Sensitive Species addressed in this report was identified in cooperation with the USFS. The information and analysis in this report was developed from field reconnaissance, published and unpublished reports and documents, and contact with agency resource personnel. The local area for this report is the Holy Cross Ranger District of the WRNF. This report only addresses Sensitive Species for project components on National Forest System lands, or species which may be impacted indirectly from activities on National Forest System lands. Portions of the Study Area occur on lands managed by Eagle County, the Town of Vail, and private lands. On those lands an assessment of potential environmental impacts to species of concern is conducted through the NEPA process and is documented in the Environmental Assessment (EA).

White River National Forest – Revised Land and Resource Management Plan

The WRNF Land and Resource Management Plan was first issued in September 1984. Forest plans are prepared in accordance with the National Forest Management Act, NEPA, and other laws and regulations. National Forest Management Act regulations state that each national forest's land and resource management plan be revised on a 10-year cycle, at a minimum, every 15 years (36 Code of Federal Regulations 219.10). The 2002 Land and Resource Management Plan (2002 Forest Plan) was prepared to meet that requirement (U.S. Department of Agriculture [USDA], 2002). It sets forth the direction the WRNF will follow in the future management of National Forest System lands and resources within its boundaries. The 2002 Forest Plan is accompanied by a final EIS, which describes the extensive analysis used in its development and formulation.

A forest plan provides guidance for all resource management activities on a national forest. It establishes:

- Forest-wide multiple-use goals and objectives
- Forest-wide management requirements (also known as standards and guidelines)
- Direction applicable to specific management areas (provided in terms of management area prescriptions)
- Monitoring and evaluation requirements
- Designation of lands as suitable or not suitable for timber production and other resource management activities
- Recommendations to Congress for the establishment of wilderness areas; wild, scenic, and recreational rivers; and other special designations as appropriate

The 2002 Forest Plan is a result of extensive analysis that is documented in the USFS Final EIS. The USFS Final EIS, in turn, discusses the planning and analysis procedures used to develop the Forest Plan. It describes six alternative management strategies for the WRNF and examines the environmental impacts of these alternatives on the WRNF's physical, biological, social, and economic resources (USDA, 2002).

This BE also addresses project consistency with migratory bird conservation. In 2008, the USFS Chief signed a Memorandum of Understanding (MOU) (#08-MU-1113-2400-264) with the U.S. Fish and Wildlife Service (USFWS) to promote the conservation of migratory birds. This Memorandum of Understanding (MOU) was pursuant to Executive Order 131866, 66 Fed. Reg. 3853 (Federal Register 2001), Responsibilities of Federal Agencies to Protect Migratory Birds. Forest Plan consistency related to forest-wide ecological issues and species addressed in the BE, including migratory birds, considered to meet WRNF Forest Plan requirements.

This report is tiered to the WRNF Land and Resource Management Plan (Forest Plan) (USFS, 1991 as amended 2005). The sections of those documents related to wildlife, along with this BE and the Forest Plan Consistency Analysis prepared for this project, constitute the technical documents that describe habitats and habitat use on and adjacent to the project site by the wildlife and plant resources considered herein for the Proposed Action.

Federally listed species which may be directly, indirectly, or cumulatively affected from implementation of the project are described in a Biological Assessment (December 2019), which has been prepared separately.

In June 2017, CDOT formally requested site-specific review and analysis under NEPA procedures for the Proposed Action. The USFS accepted this request.

Related Planning Documents or Recent/Concurrent Plans

This BE contains information on species status, distribution, and ecology derived from Colorado Natural Heritage Program (CNHP) data base maps and reports (CNHP 2019), Colorado Parks and Wildlife (CPW) Species Activity Mapping (SAM) Geographical Information System (GIS) data (Colorado Parks & Wildlife 2019), USFS database information, communications with USFS wildlife biologists, applicable scientific studies and reports, 2017-2018 field surveys, and other analyses cited herein. Collectively, the wildlife database used for this analysis represents the best scientific information currently available.

Table 1. Related Planning Documents and Plans

Title (Year)	Responsible Agency/Organization	Summary
Summit County Safe Passages: A County-Wide Connectivity Plan for Wildlife (2017)	ECO-resolutions, Wildlife Consulting Resources, Rocky Mountain Wild, USFS	Identifies areas for wildlife movement across Summit County and the need for wildlife to move across highways.
I-70 Mountain Corridor PEIS Biological Resources Technical Report (2011)	CDOT	Described wildlife, vegetation, protected species, and aquatic resources in the I-70 Mountain Corridor, which included the current Study Area.

Title (Year)	Responsible Agency/Organization	Summary
A Valued Landscape-Level Inventory of Ecological Values (ALIVE) Memorandum of Understanding	CDOT, FHWA, USFWS, USFS, BLM, Colorado Department of Natural Resources Division of Wildlife	Outlines the agency responsibilities and actions for implementing a landscape-based ecosystem approach for consideration of wildlife needs and conservation measures, and the measures to improve wildlife connectivity across the I-70 Mountain Corridor.
A Regional Ecosystem Framework for Terrestrial and Aquatic Wildlife along the I-70 Mountain Corridor in Colorado – An Eco-Logical Field Test (2011)	ECO-resolutions, Rocky Mountain Wild, Western Transportation Institute, Colorado Watershed Assembly	Identifies areas for wildlife movement across I-70 from C-470 through Glenwood Canyon and the need for wildlife to move across highways.
I-70 Eco-Logical Monitoring and I-70 Wildlife Watch Report (2011)	ECO-resolutions, Wildlife Consulting Resources, Rocky Mountain Wild, USFS	Designed to field test the Eco-Logical approach developed by FHWA. Camera monitoring was conducted in 2009 and 2010 to collect baseline information on wildlife activity and use of existing crossing structures along I-70.
I-70 West Vail Pass Habitat Linkage Structure Location, Design Criteria, and Conceptual Design Report (2009)	Felsburg Holt & Ullevig	Purpose was to understand wildlife movement patterns and associated wildlife/vehicle conflicts in order to improve habitat connectivity on West Vail Pass. Preliminary site for a crossing structure was identified at MP 187.4 based on a single Canada lynx road kill and favorable engineering characteristics.
West Vail Pass Environmental Assessment Biological Resources Technical Report (2008)	PBS&J	Evaluated the biological resources within the current Study Area (MP 180 – MP 190) for the 2008 West Vail Pass EA (EA was not completed)
Vail Pass Wildlife Linkage White Paper (2008)	Southern Rockies Ecosystem Project	Discusses the use of wildlife crossing structures as a means of mitigating habitat fragmentation and documents the current ecological and human landscape contexts of Vail Pass.

White River National Forest – Revised Land and Resource Management Plan Public Involvement

Individuals from local jurisdictions, communities, state and federal agencies, and special interest groups are part of a Project Leadership Team and a Technical Team. The Project Leadership Team and the Technical Team provided input into the alternatives development process during this NEPA process. The process followed guidance from the I-70 Mountain Corridor Context Sensitive Solutions and input from the ALIVE Committee.

Many suggestions and concerns were identified during the concept development process and the NEPA process, including neighborhood and business considerations. Comments were, for the most part, quite general in nature rather than focusing on single species. Consistent areas of consideration included:

- Maintain and improve wildlife connectivity across I-70 throughout the Study Area; more crossing structures should be added and they should be large enough for elk.
- Wetland conservation and water quality concerns.
- Wildlife exclusion fencing should be constructed between bridges to funnel wildlife through these structures.
- Bike path changes should not affect wildlife habitat, wetlands, or water quality.
- Adopt the recommendations of the 2011 Eco-Logical report (Kintsch et al. 2011) for the Study Area.

Study Area

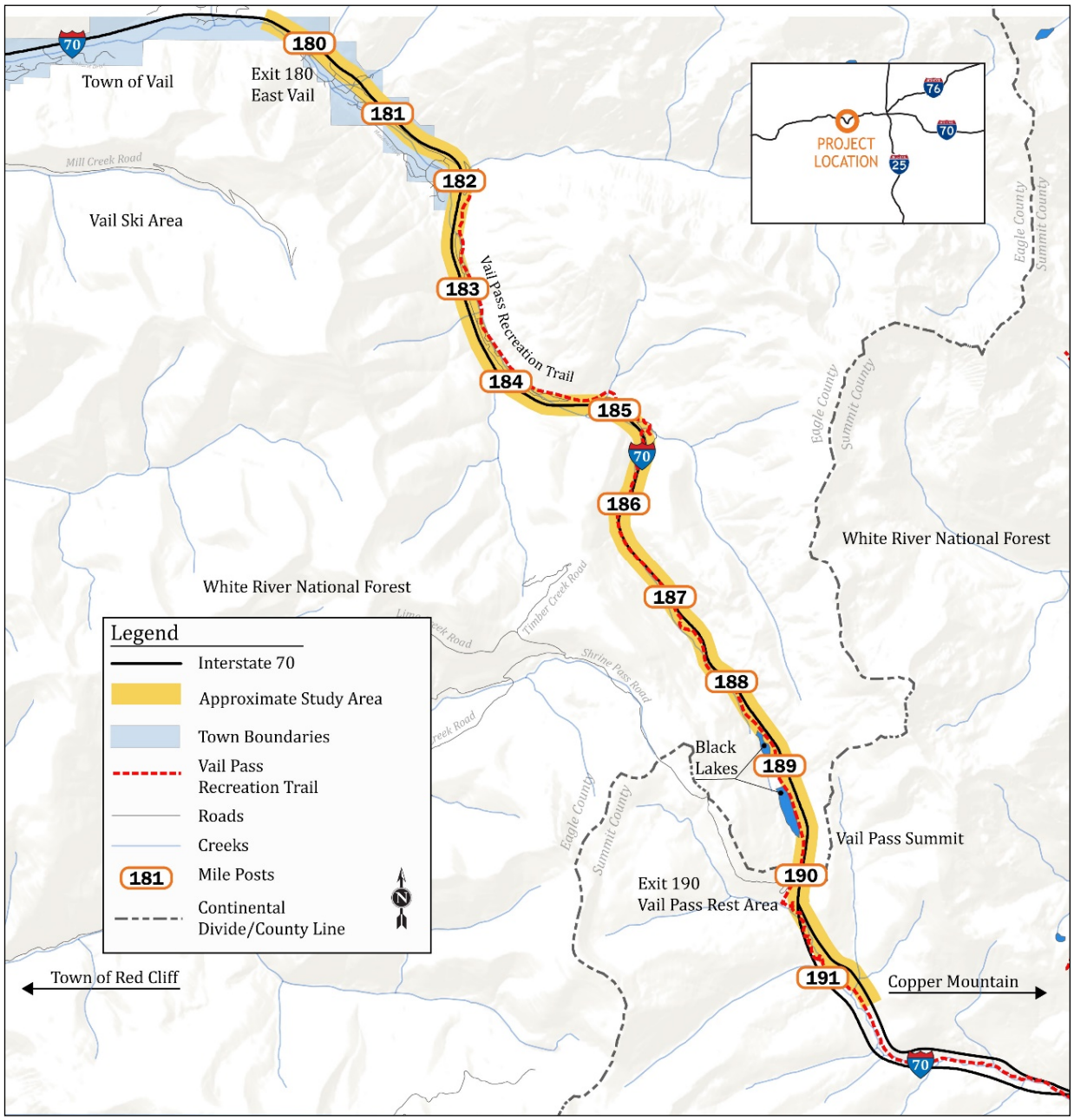
The Study Area (**Figure 1**) extends from the Town of Vail (MP 180) east to the top of Vail Pass (MP 191.5) in Eagle County and Summit Counties, Colorado. The Study Area was established early in the planning process and extends approximately 200 feet on both sides of I-70. The project extent was later established to include the potential limits of disturbance resulting from the Proposed Action and was utilized for impact analyses. The Study Area is located, in part, within both the WRNF and the Town of Vail. WRNF System Lands exist throughout the Study Area and jurisdiction of adjacent lands alternates within the Study Area between private and public ownership. I-70 traverses National Forest System Lands for approximately 9.8 miles (85%) of the Study Area. The only private land within the Study Area is at the western end of the Study Area at East Vail.

The WRNF lands within the Study Area contain various life zones and habitats (**Table 2**). Elevation within the Study Area ranges from a low of approximately 8,400 feet at the eastern end of the Study Area to approximately 10,662 feet at the top of Vail Pass. The Study Area lies within the North-Central Highlands and Rocky Mountain Section of the Southern Rocky Mountains Steppe - Open Woodland - Coniferous Forest - Alpine Meadow Physiographic Province (Bailey 1976, Bailey 1995, Bailey et al. 1998) and the Montane and Subalpine life zones. Life zones are defined by changes in climate with elevation increases, which, in turn, are reflected by the broad changes in vegetation communities (Marr 1961, Nelson 1977). **Figures 2** through **5** provide examples of some of those vegetation communities and other habitat features within the Study Area.

The Western Slope Montane Zone extends from approximately 8,000 to 9,000 feet and is characterized by Douglas-fir (*Pseudotsuga menziesii*), lodgepole pine (*Pinus contorta* var. *latifolia*), and quaking aspen (*Populus tremuloides*) with stands of Gambel oak (*Quercus gambelii*) dominated mixed montane shrublands at lower elevations with southerly to westerly aspects. The Subalpine Zone occurs above 9,000 feet, extends to treeline, and is typified by a co-dominance of Engelmann spruce (*Picea engelmannii*) and subalpine fir (*Abies lasiocarpa*). Lodgepole pine and quaking aspen occur within the Subalpine zone as well. Other prominent natural features of the Study Area include rocky cliff areas, drainages and draws that contain portions of intermittent and perennial streams and their associated riparian zones. Examples include Bighorn Creek, Black Gore Creek, Gore Creek, Miller Creek, Pitkin Creek, and Polk Creek. In addition to the natural features described above, the

Study Area and surrounding area contain various human-created features that influence the structure and function of the natural environment.

Figure 1. Project Location and Study Area



Source: DEA Project Team

Table 2. Vegetation Cover Types within the Project Extent

Vegetation Cover Type	Acres in Project Extent	Percent
Mountain Grassland	252.4	44.4%
Rock, Barren, or Road	192.3	33.8%
Engelmann Spruce-Subalpine Fir Forest	51.7	9.1%
Lodgepole Pine Forest	40.9	7.2%
Water	14.3	2.5%
Quaking Aspen Forest	11.0	1.9%
Willow Shrubland	4.4	0.8%
Aspen-Mixed Conifer Forest	2.9	0.5%
Mountain Big Sagebrush Shrubland	1.6	0.3%
TOTAL	568.6	100.0%

Figure 2. Mixed Montane Shrubland, Quaking Aspen, and Douglas Fir in the Western Slope Montane Zone at East Vail

Figure 3. Engelmann Spruce/Subalpine Fir Forest Adjacent to Black Gore Creek in the Subalpine Zone

Figure 4. Polk Creek and Associated Riparian Zone

Figure 5. Abiotic Habitat Features such as These Cliffs Occur Within the Study Area

Through the Study Area, I-70 is typically composed of two travel lanes in each direction with wide shoulders and periodic pull-outs to allow disabled vehicles and vehicles in need of tire chains to safely leave the driving lanes. A pedestrian and bike path closely parallels the interstate over the entire length of the Study Area, crossing underneath the interstate once. In addition, Old Highway 6 also parallels I-70 and crosses under the interstate around MP 181.85. Depending on location, the EB and WB lanes are separated by a vegetated median, by concrete median rail, or in some locations are grade-separated by retaining walls.

Existing Highway-Related Impacts

I-70 on West Vail Pass has two distinct areas in relation to the ability of wildlife to move across the roadway. The lower portion of the Study Area (approximately from MP 181.7 through MP 185.5) has a series of bridge structures over drainages and rivers (**Figure 6**). These structures allow wildlife movement across the highway without the need for animals to traverse over the roadway. The upper portion of the Study Area (approximately MP 185.5 through MP 191.5) does not have any structures that allow for unimpeded wildlife movement. For animals to cross the interstate in the upper portion of the Study Area, they must traverse across the travel lanes. Additionally, there are multiple barriers along the roadway that wildlife must negotiate (e.g., guardrails, median barriers, and grade separation of the EB and WB lanes of I-70).

Figure 6. Bridge at MP 185.2 Allows Unimpeded Wildlife Movement Through the Highway Corridor

The footprint of the existing highway occupies relatively little habitat, compared to the amount available in the surrounding area. Because I-70 within the Study Area is often located along valley bottoms however, it affects some of the less common and more valuable habitats in the area. In general, valley bottoms contain watercourses that support riparian vegetation and wetlands. These habitat types are important to a wide variety of wildlife in Colorado and can be compromised by disturbance.

Fragmentation of large animal ranges/habitats and movement corridors caused by I-70 is an even more important issue than habitat loss. The I-70 Draft PEIS identified interference with wildlife movement due to the barrier effects created by I-70 as one of the most serious issues affecting wildlife in the Study Area (Chapter 3, Section 3.2.1). The I-70 Mountain Corridor ALIVE Committee identified 13 linkage interference zones (LIZs) where the I-70 Mountain Corridor interferes with wildlife migration and wildlife use, including elk (*Cervus elaphus canadensis*), mule deer (*Odocoileus hemionus*), Rocky Mountain bighorn sheep (*Ovis canadensis*), and Canada lynx (*Lynx canadensis*) (J.F. Sato and Associates 2007, Felsburg Holt & Ullevig 2009, CDOT 2011, Kintsch et al. 2011). LIZ identification was used to estimate the amount the degree to which the existing highway disrupts movement corridors and patterns. LIZs were identified based largely on expert opinion and the location of existing barriers to at-grade crossings, including guardrails and fencing. Wildlife vehicle collision (WVC) data were also considered. A high rate of WVCs in an area was assumed to indicate that that portion of the highway intersected an important animal movement corridor. Additional information about historic movement patterns of mule deer (*Odocoileus hemionus*) and elk (*Cervus elaphus*), and, when data were available, bears and carnivores, were also considered.

The 2008 ALIVE MOU identified three LIZs within the Study Area: 6A - Lower West Vail Pass, 6B - Upper West Vail Pass, and 7 - East Vail Pass to Copper Mountain. These LIZs were further investigated and refined into 17 LIZs in 2011 (Kintsch et al. 2011). The ALIVE Issue Task Force (ITF) for this project agreed to use the revised 2011 LIZs which again include three within the Study Area (**Table 3**): Vail (East), Gore Creek, and West Vail Pass (**Figure 7**). As discussed above, however, existing permeability across I-70 for wildlife within the Study Area between MP 180 and MP 185.5 is excellent due to the seven bridges under which wildlife can traverse the highway (**Table 4**).

Table 3. 2011 Revised LIZs within the Study Area

LIZ Name	Mileposts	Primary Target	Secondary Target Species Range
Vail (East)	176.8 - 180.1	Canada Lynx	Black Bear, Boreal Toad, Elk, Moose, Mountain Lion, Northern Leopard Frog
Gore Creek	180.9 - 182.1	Canada Lynx	Black Bear, Elk, Moose, Mountain Lion, Mule Deer, Northern Leopard Frog, River Otter
West Vail Pass	182.9 - 188.1	Canada Lynx	Elk, Moose, Mountain Lion, Mule Deer, Northern Leopard Frog

Source: Kintsch et al. 2011

Figure 7. Project Extent with 2011 Linkage Interference Zones

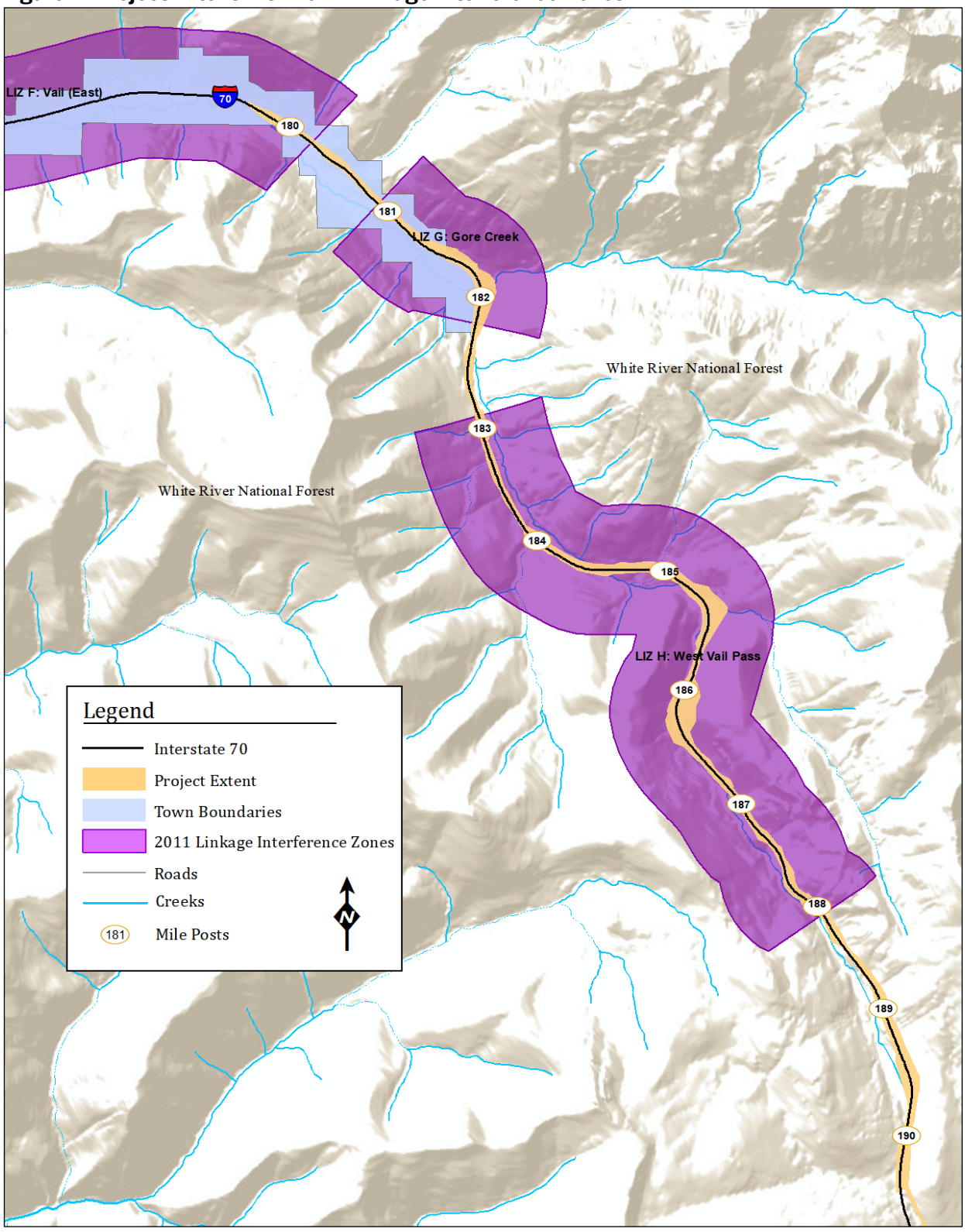


Table 4. Existing Crossing Structures in the Study Area & 2011 Connectivity Recommendations

MP LIZ	DESCRIPTION	2011 CONNECTIVITY RECOMMENDATION
181.0 G Gore Creek	Structure spans natural habitat and offers excellent wildlife passage beneath I-70. Fencing surrounding adjacent neighborhood prevents animals from accessing additional habitat to the south.	Explore opportunities with the neighborhood to develop acceptable measures that would allow wildlife to access habitat on the south side of the neighborhood, completing the north-south connection on either side of I-70. If wildlife passage through or around neighborhood can be accommodated then install guide fencing to direct wildlife towards the structure.
182.0 G Gore Creek	Large divided span bridge over Gore Creek and SH-6. Bridge connects WRNF though much of LIZ is privately owned.	Concentrate human activity immediately around paved access road at west end of structure 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 H West Vail Pass	Divided span bridge over small drainage. Creek (JP135) piped under bridge. No fencing at this site but a retaining wall on the southeast side of the roadway and heavy traffic on I-70 act as partial barriers to at-grade crossings.	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 H West Vail Pass	Large and high divided span bridge. There is no fencing at this site, but heavy traffic on I-70 acts as partial barrier to at-grade crossings.	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 H West Vail Pass	Large and high divided span bridge. There is no fencing at this site, but heavy traffic on I-70 acts as partial barrier to at-grade crossings.	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 H West Vail Pass	Large and high divided span bridge. There is no fencing at this site, but heavy traffic on I-70 acts as partial barrier to at-grade crossings. Bike path crosses under far east section of the span. Sediment pond located under structure.	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.

Source: Kintsch et al. 2011

Given the existing structures along the lower half of the Study Area and, perhaps, the elevation of the upper half, relatively low WVC rates have been documented along this stretch of highway. Nonetheless, WVCs occur throughout the Study Area. CDOT maintenance crews reported a total of 112 road kills in the Study Area for the 5-year period 2014 through 2018[1][1] (Jeff Peterson, CDOT, pers. comm.). These data are considered an incomplete picture of WVCs within the Study Area because only animals large enough to require removal by maintenance crews were reported. In addition, Colorado State Patrol (CSP) and Vail Police Department (VPD) reported a total of 47 WVCs in the Study Area for the 2014 to 2018 period (David Bourget, CDOT, pers. comm.). Similarly, these data are considered an incomplete picture of WVCs within the Study Area because only animals large enough to damage a vehicle when struck were included, and it is assumed that only a small number of those WVCs are subsequently reported. **Figures 8 and 9** depict the WVCs by species and by milepost as reported by CDOT, CSP, and VPD.

The 2014-2016 Safety Assessment (which provides the data on which the traffic and safety recommendations are based) notes that WVCs are 5.4% of the overall crashes within the Study Area. It is important to note that two lynx were killed within a short distance of each other in vehicle collisions on upper West Vail Pass at MP 187.4 in 1999 and MP 188.8 in 2004 (ALIVE MOU 2008).

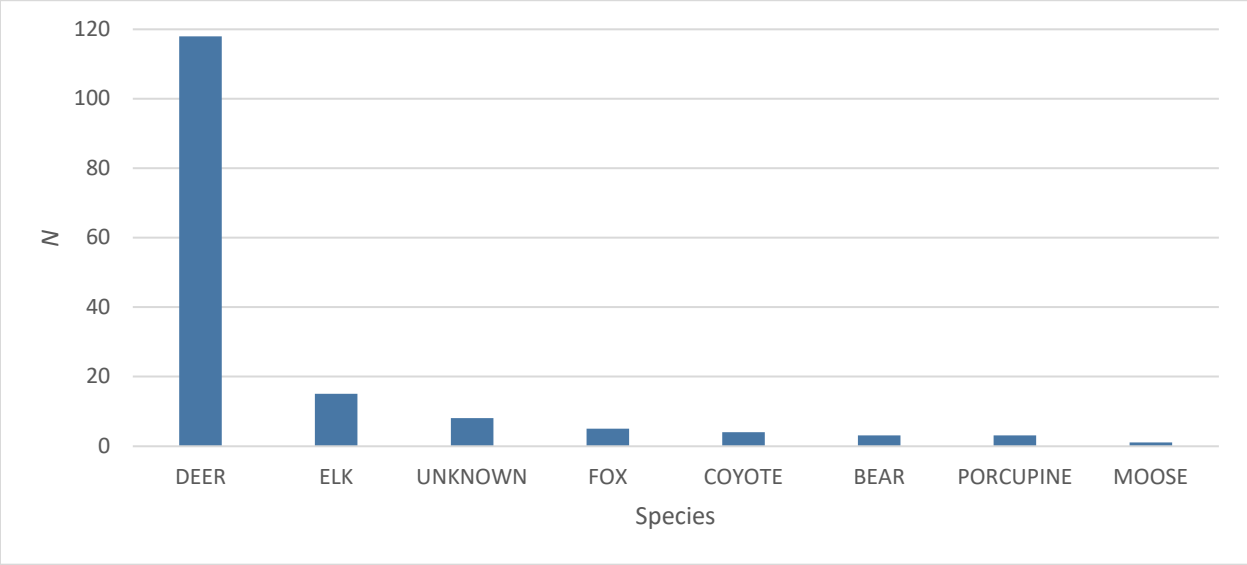
Based on interviews with Department of Transportation and wildlife agency personnel nationwide, Romin and Bissonette (1996) estimated only 16 to 50 percent of all WVCs are reported. A study conducted in Nevada compared observed road-killed deer to reported WVCs along a stretch of highway and estimated only 20 percent of WVCs were reported (Messmer et al. 2000).

Forman and Alexander (1998) coined the term "road effect zone" to encompass a wide range of impacts on wildlife, including noise, traffic disturbances, and input of contaminants into habitats from road maintenance and operations. The width of the road effect zone varies with species and terrain (Singleton et al. 2002). Rost and Bailey (1979) indicated effects occurred approximately 600 feet for mule deer and elk in forest habitats but could extend up to 1,200 feet in shrub habitats.

Forman and Deblinger (2000) addressed moose (*Alces americanus*), deer, amphibians, forest birds, and grassland birds and calculated an average road effect zone of almost 2,000 feet for their Massachusetts study. Influences of highway activity and noise may be greater for the more sensitive species such as lynx or wolverine (*Gulo gulo*) and may limit their movements through areas adjacent to the road. Winter maintenance material used to improve traction and/or melt ice from roadways is known to affect downstream (downgradient) habitats. Sand is especially evident at the higher elevations of the Study Area where application is more frequent than at lower elevations.

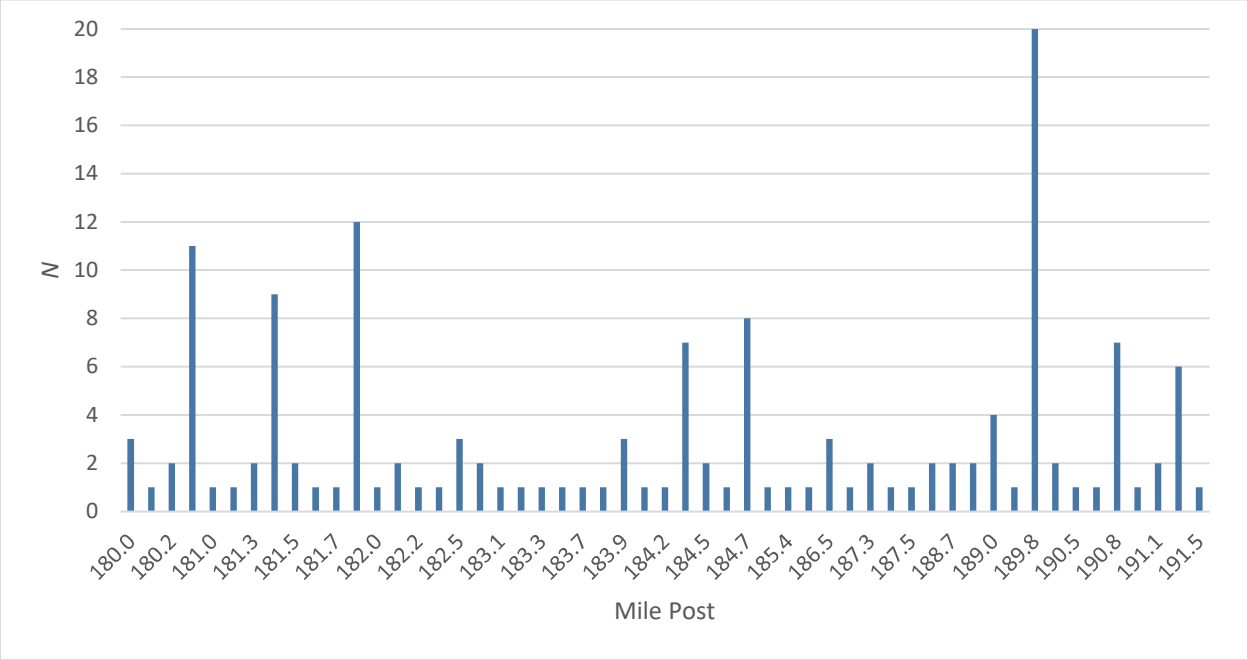
[1][1] Note: A larger date range (5 years) was used for this WVC analysis than for the safety analysis (4 years).

Figure 8. Road Killed Wildlife by Species Reported by CDOT Maintenance, CSP, and VPD (2014 through 2018).



Source: CDOT Traffic and Safety Engineering Branch; CDOT Wildlife Program

Figure 9. Road Killed Wildlife by Mile Post Reported by CDOT Maintenance, CSP, and VPD (2014 - 2018)



Source: CDOT Traffic and Safety Engineering Branch; CDOT Wildlife Program

Purpose and Need

The purpose of the project is to improve safety and operations on EB and WB I-70 on West Vail Pass.

This project is needed to address safety concerns and operational issues due to geometric conditions (steep grades and tight curves) and slow-moving vehicle and passenger vehicle interactions that result in inconsistent and slow travel times along the corridor. The I-70 Mountain Corridor PEIS identified safety and mobility issues on West Vail Pass related to speed differentials due to slow-moving vehicles. *(Mobility is defined as the ability to travel along the I-70 Mountain Corridor safely and efficiently in a reasonable amount of time.)*

- Safety Concerns: A high number of crashes occur along the corridor related to speed, tight curves, narrow roadway area, and inclement weather/poor road conditions. Speed differentials between passenger vehicles and slow-moving vehicles cause erratic lane changes and braking maneuvers resulting in crashes and spin outs. Emergency response is hampered by vehicular speeds and lack of roadway width to provide room for emergency vehicles to pass.
- Operational Issues: The steep grades and resulting speed differentials causes slow and unreliable travel times through the corridor. Tight curves also cause drivers to slow down. The corridor is frequently closed by vehicle incidents, due to lack of width to maintain a single lane of traffic adjacent to emergency responders, resulting in substantial traffic backups and delays. During winter months, the travel lanes and shoulders are severely impacted by snow accumulation, impacting the overall capacity of the corridor. (Operations is intended to describe the flow of traffic at desirable speeds given the geometric and prevailing weather conditions.)

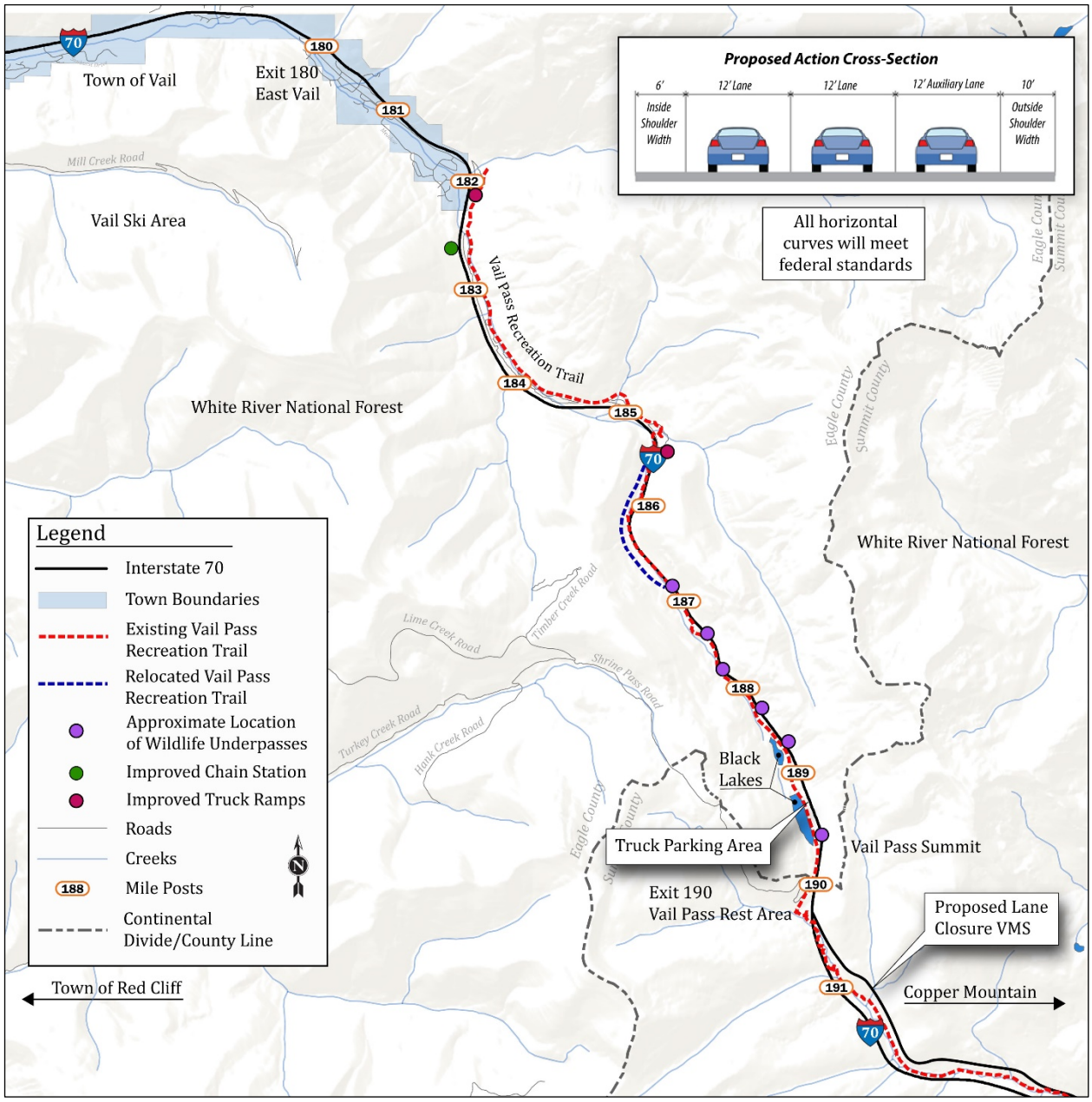
No Action Alternative

The No Action Alternative is included as a baseline for comparison to the action alternative. Under the No Action Alternative, only programmed projects that are planned and funded by CDOT or other entities would be completed. Currently, there are no large-scale transportation projects to add safety improvements, operational improvements, vehicular capacity, and multimodal facilities along I-70 within the project area. The No Action Alternative would leave West Vail Pass as it currently is configured and would not provide substantial improvements beyond typical current maintenance (e.g. resurfacing and plowing) activities. The roadway would remain the same, with 2 EB and 2 WB lanes (each 12 feet in width), an inside shoulder typically 4 feet in width, and an outside shoulder typically 10 feet in width.

Proposed Action Alternative

The Proposed Action (**Figure 10**) will add a 12-foot auxiliary lane, both EB and WB, for 10 miles from approximately the East Vail exit (MP 180) to the Vail Pass Rest Area exit (MP 190). Existing lanes will be maintained at 12 feet and the shoulders would be widened to a minimum of 6 feet for inside shoulders and be maintained at 10 feet for outside shoulders. All existing curves will be modified as needed to meet current federal design standards.

Figure 10. I-70 West Vail Pass Auxiliary Lanes Proposed Action Alternative



Source: DEA Project Team

Intelligent Transportation System (ITS) equipment will also be installed along the I-70 project corridor, consistent with recent study recommendations. Additional variable message signs (VMSs) will be installed at key locations to warn drivers of upcoming curves, grades, and incidents. Additional variable speed limit signs will be installed to manage driver speeds to conditions. Automated lane closure signage will be installed approaching the East Vail exit on EB I-70 and approaching the WB I-70 Vail Pass Rest Area exit to quickly and efficiently close lanes when needed.

Additional elements of the Proposed Action include:

- The Vail Pass Recreation Trail will be directly impacted by the addition of the I-70 auxiliary lane and therefore relocated for approximately two miles from MP 185 to MP 187.
- Existing emergency truck ramps, located at approximately MP 182.2 and 185.5, will be upgraded to current design standards.
- Six wildlife underpasses and wildlife fencing will be constructed throughout the corridor.
- Additional capacity will be added to the existing commercial truck parking area at the top of Vail Pass.
- Widened shoulders (minimum of eight feet of additional width beyond the 10' shoulder) at multiple locations to accommodate emergency pull-offs, emergency truck parking, and staging for tow trucks.
- Improved median emergency turnaround locations to accommodate emergency and maintenance vehicle turnaround maneuvers.
- Improved chain station located at approximately MP 182.5 with additional parking, signage, lighting, and separation from the I-70 mainline.
- Avalanche protection located at approximately MP 186.

Purpose of the Biological Evaluation

USFS Manual 2600, Chapter 2670 Threatened, Endangered and Sensitive Plant and Animals provides additional guidance on habitat management for all sensitive species. The direction establishes the process, objectives, and standards for conducting a BE and ensures that all Forester Sensitive Species (FSS) species receive full consideration in the decision-making process. Region 2 Manual Supplement 2600-94-2 provides additional direction for conducting the analysis required of the BE. The BE portion of this report provides impact determinations for FSS species not addressed in the Biological Assessment (BA) section; these include FSS, FSS of local concern, and state species of concern.

Methods

Field reconnaissance of the Study Area and taxon specific surveys were conducted by project team biologists between July 2017 and June 2018 (**Table 5**).

In addition to the taxon specific surveys, general reconnaissance of the Study Area was conducted on July 19 and July 21, 2017. The entire corridor was walked or driven, while noting plant communities, direct wildlife observation, wildlife habitat, and basic stream and riparian attributes. Formal habitat mapping and wildlife surveys were not conducted at this time. During the reconnaissance, various highway attributes such as bridges, culverts, sediment retention basins, median rails, etc., and existing impacts to local wildlife populations were noted. All road-killed wildlife encountered during the reconnaissance, including location and species, were recorded. Numerous photos in the corridor were taken at the time of the reconnaissance.

The project team biologists surveyed culverts and bridges for terrestrial mammal tracks or signs. An assessment of wildlife habitat and wildlife movement areas was conducted based on available datasets and reports from CDOT, CPW, and other organizations (See **Table 1**). WVC data (reported accidents and carcass locations from CDOT maintenance patrols, CSP, and VPD) were analyzed to

identify areas with high WVC rates by species. Existing barriers to movement, as well as features that may facilitate wildlife movement, were also documented.

Table 5. Field Surveys Conducted for the Biological Evaluation

Survey Type	Survey Date	Primary Taxa	Secondary Taxa
Broadcast Survey	June 15-16, 2017	Northern Goshawk	Other Accipiters & Raptors
Avian Survey	July 5-6, 2017	Migratory Birds	Raptors, Songbirds
Winter Track Survey	December 20, 2017	Canada Lynx	American Marten, Bobcat, Coyote, Elk, Mountain Lion, Mule Deer
Winter Track Survey	January 9, 2018	Canada Lynx	American Marten, Bobcat, Coyote, Elk, Mountain Lion, Mule Deer
Winter Track Survey	January 25, 2018	Canada Lynx	American Marten, Bobcat, Coyote, Elk, Mountain Lion, Mule Deer
Winter Track Survey	February 8, 2018	Canada Lynx	American Marten, Bobcat, Coyote, Elk, Mountain Lion, Mule Deer
Winter Track Survey	February 23, 2018	Canada Lynx	American Marten, Bobcat, Coyote, Elk, Mountain Lion, Mule Deer
Winter Track Survey	March 8, 2018	Canada Lynx	American Marten, Bobcat, Coyote, Elk, Mountain Lion, Mule Deer
Owl Survey	March 22-23, 2018	Boreal Owl	Other Nocturnal Birds
Winter Track Survey	March 27, 2018	Canada Lynx	American Marten, Bobcat, Coyote, Elk, Mountain Lion, Mule Deer
Winter Track Survey`	April 6, 2018	Canada Lynx	American Marten, Bobcat, Coyote, Elk, Mountain Lion, Mule Deer
Pollinator Survey	June 19, 2018	Western Bumble Bee	Other Bees

The winter track survey transect locations and results are shown on **Figures 11 and 12**, respectively.

Figure 11. Winter Track Survey Transect Locations

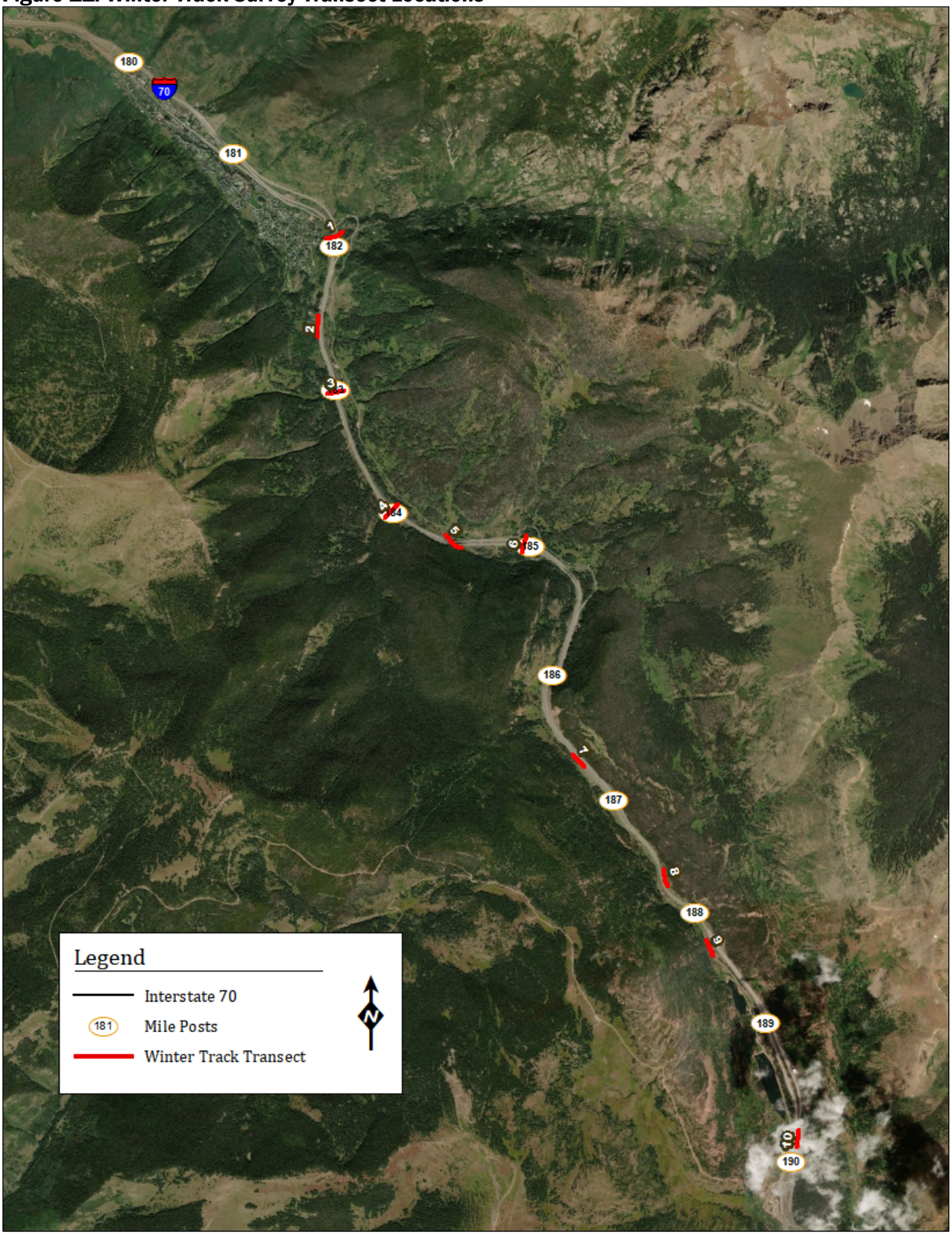
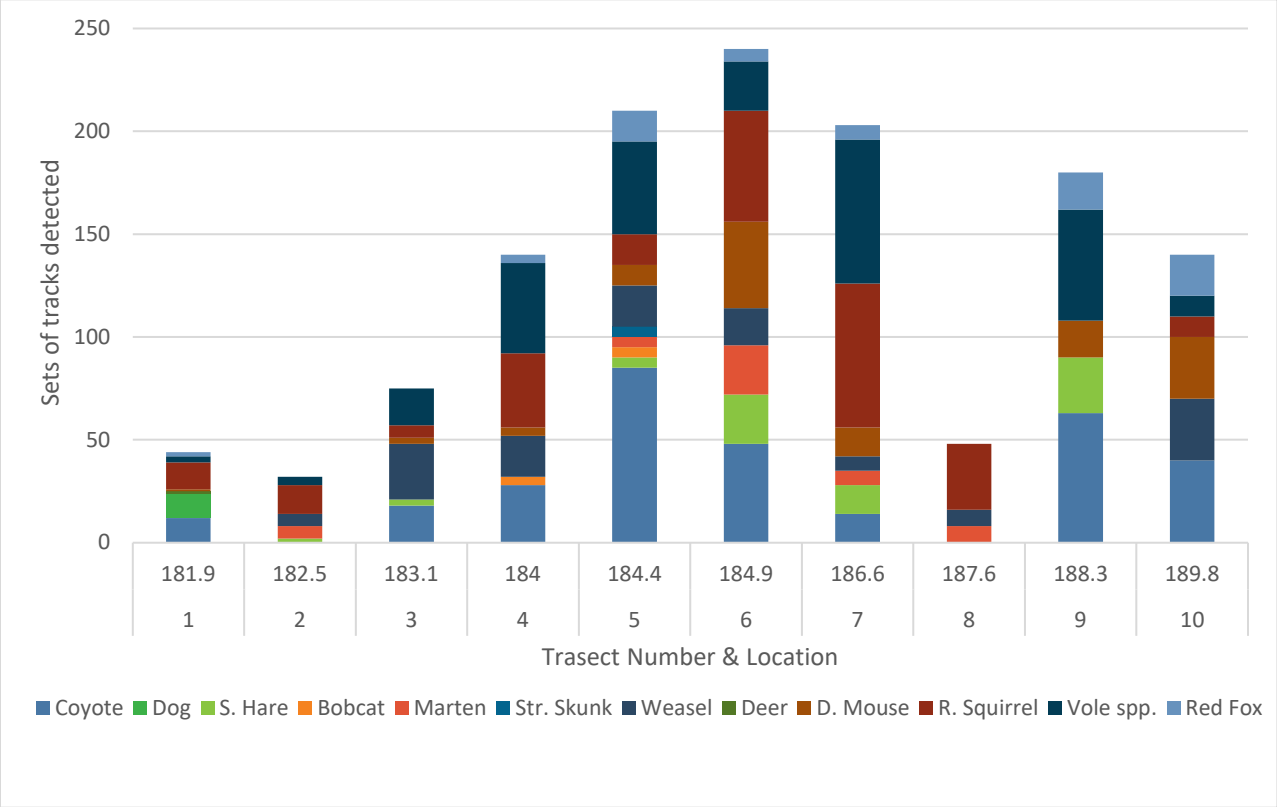


Figure 12. Winter Track Survey Results



CONSULTATION HISTORY

CDOT has initiated coordination with federal and state agencies, local stakeholders, and working groups, and will continue that commitment throughout the project. The agency and public scoping process includes working with the ALIVE ITF to fulfill the commitments set forth in the 2008 ALIVE MOU, which focuses on WVCs and habitat connectivity. The ALIVE Committee concept was developed during the NEPA process that was completed for the I-70 Mountain Corridor Final PEIS. The MOU, signed in April 2008, details the responsibilities of each agency in addressing a project.

An initial project scoping meeting was held on June 12, 2017 with CDOT environmental specialists to give a project overview and identify concerns and documentation requirements. In order to fulfill responsibilities set forth in the ALIVE MOU, the ALIVE ITF scheduled two meetings to identify and discuss wildlife concerns, potential impacts, and mitigation strategies. The ALIVE meetings were held on April 8, 2018 and December 14, 2018. The ALIVE meetings were attended by representatives from, CDOT, Colorado Wild, CPW, ECO-resolutions (first meeting only), FHWA (first meeting only), Town of Vail, USFS, and USFWS. In addition, two Stream and Wetland Ecological Enhancement Program (SWEEP) Committee meetings were held on May 16, 2018 and February 11, 2019, respectively, to integrate concerns about wetlands, sedimentation, Total Maximum Daily Loads, and other Clean Water Act Section 303(d) related issues.

During the initial ALIVE meeting, CPW, USFWS, and WRNF personnel expressed concern regarding the potential impacts to elk, mule deer and other wildlife in the Study Area and the increased barrier effect of additional lanes. The recommendations of the various I-70 habitat linkage and crossing

structure studies were discussed as mitigation to increase permeability for wildlife. Each of the three LIZs within the Study Area were discussed. CDOT presented a number of mitigation strategies at the subsequent ALIVE meeting. The primary focus was the design and location of underpasses to increase permeability in the upper portion of the Study Area since existing and planned bridges will provide sufficient wildlife crossing opportunities in the lower portion. There was general agreement that many small to large underpasses would provide more effective mitigation than a single overpass as had been recommended in past studies. CDOT has also expressed safety concerns over the potential shading and icing hazards that could result from a wildlife overpass constructed in an area that is in the top 10 highest crash rates per volume of vehicles on all of I-70 (CDOT Statewide Crash Data 2016) and includes steep grades (which exceed the standard of 5%) and numerous curves. This factor was a primary consideration when selecting an underpass versus an overpass for this location.

Consultation and coordination efforts conducted to date related to biological resources for this project are listed in **Table 6**. Meeting minutes are included in **Appendix B**. In addition, two public stakeholder meetings were held on February 22, 2018 and December 13, 2018.

Table 6. Coordination and Consultation Summary

Agency or Committee	Meeting Date	Purpose of Meeting
Environmental Scoping Meeting	June 12, 2017	To present information and solicit input from environmental specialists and resource leads to incorporate into scoping information.
USFS Scoping Meeting	July 19, 2017	As a cooperating agency, USFS was consulted regarding botanical and wildlife field surveys, existing data, etc.
ALIVE	April 8, 2018	Provide overview of project and project effects on wildlife with a focus on LIZs within the Study Area.
SWEEP	May 16, 2018	Provide overview of project and discuss issues relating to water quality, wetlands, and aquatic resources.
CPW	July 20, 2018	Discuss wildlife movement patterns, habitat use, crossing structures, and interaction with I-70 in Study Area.
CPW/USFS	November 26, 2018	Collaboration on wildlife connectivity & crossing structures – design and location.
ALIVE	December 14, 2018	Discuss feasibility of a variety of mitigation solutions with specific focus on crossing structures to mitigate the effects of the project on and improve conditions for wildlife.
SWEEP	February 11, 2019	Refine sediment mitigation solutions and integrate concerns about sediment ponds acting as wildlife attractants into the siting and design of sediment ponds.
USFS Check-in Meeting	April 11, 2019	Provide an update on the Proposed Action and design option status. Gather feedback on trail realignment options and approach to other environmental resources.

Species Considered and Evaluated

The list of sensitive species identified by the USFS Regional Forester was reviewed with CDOT and USFS biologists at the June 19, 2017 USFS Scoping Meeting. With their assistance, the list was revised to include only those species that had the potential to occur within the Study Area (shown in **Table 7**). Species not known or with no potential of occurring in the Study Area are documented with brief rationale in **Table 7** and will not be discussed further in this document. Excluded species have been dropped from further analysis by meeting one or more of the following conditions:

- Species does not occur, nor is expected to occur in the Study Area during the time activities would occur;
- Occurs in habitats that are not present; and/or
- Is outside of the geographical or elevational range of the species.

The following table lists the R2 sensitive species that may be influenced by the Proposed Action. Potentially affected species are indicated in bold and are analyzed in further detail (Canada lynx [*Lynx canadensis*], a species protected under the Endangered Species Act (ESA) as a threatened species, is covered in the BA for this project). No further analysis is needed for species that are not known or suspected to occur in the Study Area, and for which no suitable habitat is present. The table was reviewed and approved by WRNF terrestrial (August 22, 2019) and aquatic (August 22, 2019) biologists and CPW terrestrial (August 7, 2019) and aquatic (August 22, 2019 and September 16, 2019) biologists. Information on species status, distribution, and ecology was derived from CNHP data base maps and reports (CNHP 2019); NatureServe Explorer database (NatureServe 2019); CPW SAM data (Colorado Parks & Wildlife 2019); WRNF vegetation mapping; field surveys within the analysis area; the author's knowledge of species habitat and life history; applicable scientific studies, reports, and evaluations from the BE for the Forest Plan 2002 Revision (USDA Forest Service 2002); the 2018 Region 2 Sensitive Species Supplement (USDA Forest Service 2018b); personal communications with agency biologists; and a variety of taxa specific literature. **Table 8** provides the mapping data sources used to evaluate sensitive species.

Table 7. USFS, Rocky Mountain Region Sensitive Animal Species that Occur or Have the Potential to Occur on White River National Forest (December 18, 2018)

Species	Basic Habitat Description	Suitable Habitat w/in Study Area	Species Known w/in Study Area	Surveys Conducted	Rationale for Exclusion from Analysis / Notes
Insects					
Great Basin Silverspot *Speyeria nokomis nokomis*	Dependent on wetlands fed by springs or seeps; hosts on *Viola nephrophylla (V. sororia* ssp *affinis),* in Mesa Co.	No	No	No	The Study Area occurs between 9,056 to 10,440 feet and is outside the known elevation range for this species.

Species	Basic Habitat Description	Suitable Habitat w/in Study Area	Species Known w/in Study Area	Surveys Conducted	Rationale for Exclusion from Analysis / Notes
Monarch Butterfly *Danaus plexippus*	**Widespread, but requires milkweeds for caterpillars.**	**Yes**	**No**	**No**	**NA**
Western Bumble Bee *Bombus occidentalis*		**Yes**	**No**	**Yes**	**NA**
Birds*					
Black Swift *Cypseloides niger*	Nests behind or next to waterfalls and wet cliffs. Forages over forests and open areas.	No	No	Yes	Suitable habitat does not exist within the Study Area.
Boreal Owl† *Aegolius funereus*	**Mature spruce/fir and mixed conifer forested areas with preference for wet situations (bogs or streams) for foraging. Found above 9,000 ft.**	**Yes**	**No**	**Yes**	**Surveys conducted winter/spring 2018. No owls detected.**
Brewer's Sparrow *Spizella breweri*	Sagebrush shrublands, mountain parks; rarely found in alpine willow stands.	No- large blocks of sagebrush are absent	No	Yes	Suitable habitat does not exist within the Study Area. Sagebrush shrublands present but not extensive or high quality.
Columbian Sharp-tailed grouse *Tympanachus phasianellus columbianus*	Mid elevation mountain sagebrush/grassland habitat usually adjacent to forested areas, potential habitat on NW corner of Blanco District, NE Eagle County.	No	No	No	Suitable habitat does not exist within the Study Area.
Ferruginous Hawk *Buteo regalis*	Open grasslands and shrub steppe communities. Nests in tall trees or shrubs along streams or on steep slopes. Occasional fall migrant in Garfield, Eagle, Pitkin, and Rio Blanco Counties.	Yes- but no potential for disturbance of nests, individuals, or modification of breeding or foraging habitat	Lime Park only during fall migration	No	Suitable habitat does not exist within the Study Area.
Flammulated Owl *Otus flammeolus*	Depends on cavities for nesting, open forests for foraging, brush for roosting. Occupy open ponderosa pine or forests with similar features (dry montane conifer or aspen, with dense saplings). Documented in Garfield, Eagle, Pitkin, and Rio	No- aspen vegetation in Study Area too small in diameter for nesting	No	No	Suitable habitat does not exist within the Study Area.

Species	Basic Habitat Description	Suitable Habitat w/in Study Area	Species Known w/in Study Area	Surveys Con-ducted	Rationale for Exclusion from Analysis / Notes
	Blanco Counties, generally from 7,500 to 9,500 ft.				
Greater Sage-grouse *Centrocercus urophasianus*	Large sagebrush shrublands on Dillon District, adjacent to Eagle and HX District in Routt and northern Eagle County.	No	No	No	Suitable habitat does not exist within the Study Area.
Lewis' Woodpecker *Melanerpes lewis*	Open pine forests, burnt over areas with snags and stumps, riparian and rural cottonwoods, and pinyon-juniper woodlands.	No	No	Yes	Study Area is outside elevation range of species.
Loggerhead Shrike *Lanius ludovicianus*	Sagebrush shrublands, mountain parks; may be found in willow stands. Nests in shrubs or small trees, preferably thorny such as hawthorn. Primarily found east of Continental divide, NW Colorado, and southcentral Colorado	No	No	Yes	Suitable habitat does not exist within the Study Area.
Northern Goshawk‡ *Accipiter gentilis*	**Mature forest generalist. Often found in mixed conifer/aspen stands. Nests primarily in mature aspen and pine trees. Throughout WRNF nesting above 7,500 ft to 11,000 ft.**	**Yes**	**No**	**Yes**	**Surveys conducted summer 2018. No goshawks detected.**
Northern Harrier *Circus cyaneus*	Rare summer resident in mountain marshes and wetlands. In alpine tundra in fall migration. Uses shrublands for foraging. Documented in Garfield, Eagle, Pitkin, and Rio Blanco Counties, generally ranges up to 10,000 ft in summer.	No	No	No	Suitable habitat does not exist within the Study Area. Use an array of habitats but generally avoid high elevations in the Rocky Mountains (Slater and Rock 2005).
Olive-sided Flycatcher *Contopus borealis*	**Mature spruce/fir, lodgepole pine, and Douglas-fir forests with preference for natural clearings, bogs, stream and lakeshores with water-killed trees, forest burns and logged areas with standing dead trees. Generally from 7,500 to11,000 ft.**	**Yes**	**No**	**Yes**	**Avian surveys conducted summer 2018. Two singing male olive-sided flycatchers detected.**

Species	Basic Habitat Description	Suitable Habitat w/in Study Area	Species Known w/in Study Area	Surveys Conducted	Rationale for Exclusion from Analysis / Notes
Purple Martin *Progne subis*	Nesting in decadent, mature aspen trees (DBH ≥ 36 cm) or snags from 8,000 to 9,000 ft. near streams or water. In Garfield, Eagle, Pitkin, Mesa, and Rio Blanco Counties.	No	No	No	Most aspen stands in Study Area unsuitable. Conifer dominant or co-dominant. Western subspecies generally restricted to Western Slope aspen forest.
Sage Sparrow *Amphispiza belli*	Sagebrush shrublands, found adjacent to SW Rifle District and in western Eagle Co, but primarily Western and South central Colorado	No - large blocks of sagebrush are absent	No	Yes	Sagebrush shrublands, found adjacent to SW Rifle District and in western Eagle Co, but primarily Western and South central Colorado.
White-tailed Ptarmigan *Lagopus leucurus*	**Alpine tundra, high-elevation willow thickets, krummholtz, spruce-fir (winter).**	**Yes- but no potential for disturbance of nests, individuals, or modification of breeding or foraging habitat.**	**No**	**No**	**NA**
Mammals					
American Marten *Martes americana*	**Subalpine spruce/fir and mixed conifer forests with complex physical structure. Above 8,500 ft across WRNF.**	**Yes**	**Yes**	**Yes**	**Yes- tracks observed during surveys**
Fringed Myotis *Myotis thysanodes*	Conifer, Gambel oak shrublands, caves, mines, building roosts, western WRNF including Rio Blanco, Garfield, and Mesa up to 7,500'.	No	No	No	Suspected to occur on WRNF but at elevations below the Study Area. Nearest observations in eastern Garfield and northern Teller counties (Keinath 2004).

Species	Basic Habitat Description	Suitable Habitat w/in Study Area	Species Known w/in Study Area	Surveys Con-ducted	Rationale for Exclusion from Analysis / Notes
Hoary Bat *Lasiurus cinereus cinereus*	**Conifer & deciduous tree cavities, cliffs, or bridges on edge of clearings up to 9,910 ft. Frequently detected in ponderosa pine forests where large deciduous trees are lacking.**	**No**	**No**	**No**	**Known to occur within the Study Area (Siemers and Neubaum 2015).**
Pygmy Shrew *Sorex hoyi*	**In subalpine spruce-fir forest edges that are adjacent to wetlands, fens, or standing water habitats. Documented on Sopris, Holy Cross, and Dillon Districts, above 9,500 ft.**	**Yes**	**No**	**No**	**NA**
River Otter *Lontra canadensis*	Riparian habitats that traverse a variety of other habitats. Mainly larger river systems at low to moderate elevations; need ice-free stretches of river in winter.	No	No	No	Riparian habitats that traverse a variety of other habitats. Mainly larger river systems, Summit and Eagle counties.
Rocky Mountain Bighorn Sheep *Ovis canadensis canadensis*	Rocky, steep, or rugged terrain for escape cover with open grass-dominated habitats nearby for foraging. Summer range at high elevation and winter range in valley bottoms or where snow depth is minimal.	No	No	No	According to CPW (C. Wescoatt, pers. comm.), bighorn sheep do not occur within the Study Area and are unlikely to be affected.
Spotted Bat *Euderma maculatum*	Cliff/Rock/Scree in arid Douglas-fir or Ponderosa Pine canyons associated with water. Occurs in western semi-desert canyonlands in Colo. (Armstrong et al. 1994, Adams 2003).	No	No	No	Suitable habitat does not exist within the Study Area.
Townsend's Big-eared Bat *Corynorhinus townsendii townsendii*	Semidesert shrublands, pinyon-juniper woodlands and open montane forests below 10,000 ft. (Siemers 2002). Requires caves or abandoned mines for roost sites during all seasons and stages of its life cycle, and its distribution is strongly correlated with the availability of these features.	No	No	No	Suitable habitat does not exist within the Study Area.
Amphibians					

Species	Basic Habitat Description	Suitable Habitat w/in Study Area	Species Known w/in Study Area	Surveys Con-ducted	Rationale for Exclusion from Analysis / Notes
Boreal (western) Toad *Anaxyrus boreas boreas*	**Damp areas near marshes, wet meadows, streams, beaver ponds, glacial kettle ponds, and lakes interspersed in subalpine forest. Beaver ponds with emergent vegetation are the one key habitat component necessary for breeding.**	**Yes**	**Yes**	**No**	**Only occurrence within the Study area is East Vail Pond. Proposed Action will not affect the pond.**
Northern Leopard Frog *Lithobates pipiens*	**Wet meadows and the banks and shallows of marshes, ponds, glacial kettle ponds, beaver ponds, lakes, reservoirs, streams, and irrigation ditches.**	**Yes**	**Yes**	**No**	**NA**
Fish					
"Blue Lineage" Colorado River Cutthroat Trout (*Oncorhynchus clarkii* c.f. *pleuriticus*)	**Cold, clear, gravely headwater streams and mountain lakes that provides an abundant food supply of insects.**	**Yes**	**No**	**No**	**Occur in Pitkin, Polk, and Miller Creeks (K. Bakich, CPW, pers. comm. 2018).**
Bluehead Sucker *Catostomus discobolus*	Most commonly found in small to mid-sized streams in the Upper Colorado River Basin.	No	No	No	Suitable habitat does not exist within the Study Area. Nearest known occurrence of bluehead suckers is approximately 10 miles downstream (M. Woody, USFS, pers. comm).
Flannelmouth Sucker *Catostomus latipinnis*	Medium to large streams in the Upper Colorado River Basin.	No	No	No	Suitable habitat does not exist within the Study Area. Nearest known occurrence of flannelmouth suckers is approximately 10 miles downstream (M. Woody, USFS, pers. comm).

Species	Basic Habitat Description	Suitable Habitat w/in Study Area	Species Known w/in Study Area	Surveys Conducted	Rationale for Exclusion from Analysis / Notes
Mountain Sucker *Catostomus platyrhynchus*	Found in smaller rivers and streams in northwestern Colorado.	No	No	No	Suitable habitat does not exist within the Study Area. (M. Woody, USFS, pers. comm).
Roundtail chub *Gila robusta*	In Colorado they historically occurred in streams typically below 7,400 feet elevation.	No	No	No	Suitable habitat does not exist within the Study Area. Roundtail chub are not found above Glenwood Canyon (M. Woody, USFS, pers. comm).

* Field surveys were conducted for all birds with special emphasis on migratory birds. † Boreal owl surveys were implemented but biologists included all nocturnal birds in their documentation. ‡ Northern goshawk specific surveys were conducted but all other observed raptors were recorded as well.

Sources for species occurrence and habitat association include: Adams (2003), Armstrong et al. (2011), Fayette et al. (2000), USFS (2002a), Kingery (1998), NatureServe (2019), Wickersham (2007), and various personal communications with agency personnel.

Table 8. Source of Mapping Data for Sensitive Animal Species Evaluated

SPECIES	DATA SOURCE	USFS R2 FSVEG MAP UNITS OR SAM ELEMENTS
Monarch Butterfly	R2 FSVeg Map Units	8, roadside areas, milkweed obligate
Western Bumblebee	R2 FSVeg Map Units	8, 18
American Three-toed Woodpecker	R2 FSVeg Map Units	7,10,11,14,17
Boreal Owl	R2 FSVeg Map Units	3,10,17
Northern Goshawk	R2 FSVeg Map Units	3,10,14
Olive-Sided Flycatcher	R2 FSVeg Map Units	3,7,8,10,11,14,15,17,18
White-tailed Ptarmigan	None of the alternatives would have an impact on mapped alpine tundra vegetation	2
American Marten	R2 FSVeg Map Units	7,10,11,15,17
Hoary Bat	R2 FSVeg Map Units	3,7,10,11,14,17
Pygmy Shrew	R2 FSVeg Map Units	3,7,10,15,17,18
Boreal Toad	R2 FSVeg Map Units, CPW/ USFS Known Locations	9,15,18
Northern Leopard Frog	Populations on WRNF well removed from the Study Area. No impacts calculated.	
Colorado River Cutthroat Trout	SAM	Impacts calculated to linear feet of Pitkin, Polk, and Miller Creeks.
Bluehead Sucker	No disturbance by alternatives in the upper Eagle River (above Dowd Canyon) where bluehead suckers are present.	
Flannelmouth Sucker	Alternatives would have no direct effect on wetlands and riparian areas in the mainstem of the Colorado River in Glenwood Canyon (below milepost 134), or in the Blue River above Lake Dillon where flannelmouth suckers are present.	

Data Sources: R2 FSVeg Map Units – 2017 USFS Region 2 field sampled vegetation data GIS layer (USDA Forest Service 2017); SAM - CPW SAM (Colorado Parks & Wildlife 2019)

R2 FSVeg Map Units Key (USDA Forest Service 2017): 1 Agricultural, 2 Alpine Meadows – Krummholz, 3 Aspen Forest,4 Barren Land, 5 Bristlecone - Limber Pine Forest, 6 Developed, 7 Douglas-Fir Forest, 8 Grass / Forb Meadows, 9 Lakes & Ponds, 10 Lodgepole Pine Forest,11 Mixed Forest, 12 Mountain Shrubland, 13 Pinyon-Juniper Woodland, 14 Ponderosa Pine Forest, 15 Riparian Forest and Shrub, 16 Sagebrush Shrubland, 17 Spruce - Fir Forest, 18 Wetland (general)/Water

SENSITIVE SPECIES EVALUATIONS AND ANALYSIS OF EFFECTS

All animal species federally listed by the USFWS, as "Threatened, Endangered or Proposed" are addressed in the BA prepared for this project.

EFFECTS COMMON TO ALL SPECIES

Sensitive terrestrial wildlife species may be affected by resource management actions. Direct mortality from management actions may be considered an uncommon result but can occur, especially with juvenile animals. This report is completed to forecast likely impacts using what is known about

the existing environment, the characteristics of the proposal, current knowledge about habitat needs for a species, the adaptive capability for the species in question and the dynamics of the environment.

Abundant research indicates that habitat quality for many wildlife species is reduced along roads. Effects are usually identified as direct loss of habitat, changing landscape pattern of habitat, increased predation, reduced fitness from disturbance, collision with vehicles, or other disturbance. As there is no significant net increase in road length/surface area acreage resulting from the Proposed Action, long-term negative impacts from these actions are anticipated to be minimal.

Habitat within the Study Area

USFS Region 2 vegetation resource data (R2Veg) was used as a surrogate for a species habitat. This information was used to provide context of the resource in the area and to assist in assessing direct, indirect, and cumulative effects for special status species occurring within the study area. Field studies were conducted in the study area during the spring, summer, and fall of 2017 and winter of 2017-18 (**Table 6**) and provided the basis for assessing the current extent of vegetation communities. Additional information was obtained during the summer of 2017 when a USFS sensitive plant survey was conducted within the Study Area. **Table 9** lists the acreage and percent cover of the major vegetation types (i.e., habitat) within the area surrounding the Study Area, as depicted on **Figure 13**. **Table 10** lists the cover types and acreage directly affected by implementation of the Proposed Action. **Table 2** shows the extent of R2 vegetation cover types within the project extent and **Figures 2** through **5** provide examples of some of those cover types and other habitat features within the Study Area.

Table 9. Vegetation Cover Types (FSVeg) within 2 Miles of I-70 MP 180 - 190

Cover Type	Acres within 2 miles of the Study Area	Percent Cover
Alpine	2,058.2	6.15%
Mountain Grassland	7,384.6	22.05%
Mountain Shrubland	80.2	0.24%
Bare Soil – Rock*	1,457.2	4.35%
Riparian	22.6	0.07%
Sagebrush Shrubland	54.3	0.16%
Quaking Aspen	2,950.4	8.81%
Lodgepole Pine	3,416.2	10.20%
Quaking Aspen-Mixed Conifer	154.1	0.46%
Engelmann Spruce - Subalpine Fir	14,378.2	42.94%
Upland Willow	206.0	0.62%
Water	1,325.5	3.96%

* Includes existing roadway and trail (paved surfaces)

Table 10. Vegetation Cover Types (FSVeg) Directly Affected by the Proposed Action

Cover Type	Acres	Percent of Project Extent	Percent of Type within 2 miles of the Study Area
Mountain Grassland	252.4	44.4%	3.4%
Rock-Bare Soil*	192.3	33.8%	13.2%
Engelmann Spruce - Subalpine Fir	51.7	9.1%	0.4%
Lodgepole Pine	40.9	7.2%	1.2%
Water	14.3	2.5%	0.2%
Quaking Aspen	8.1	1.9%	0.3%
Willow Shrubland	4.4	0.8%	2.1%
Quaking Aspen-Mixed Conifer Forest	2.9	0.5%	1.9%
Sagebrush Shrubland	1.6	0.3%	2.9%

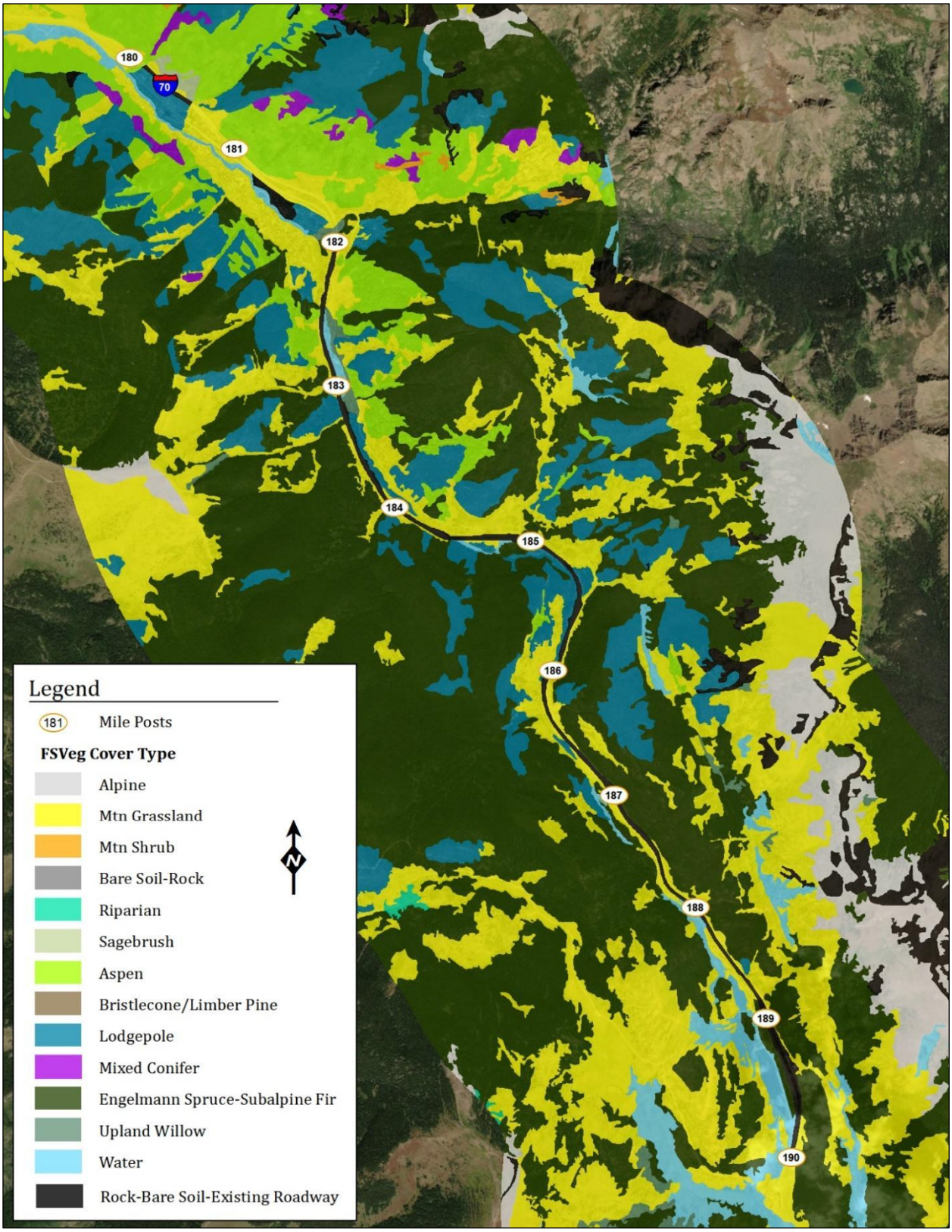
* Includes existing roadway and trail (paved surfaces)

Based on the habitat affinities for species in **Table 7** that are included in this analysis, three dominant habitat types, Engelmann spruce – Subalpine fir (spruce-fir), lodgepole pine, mountain grassland, and quaking aspen would be impacted under the Proposed Action. No other habitat types which exist within the Study Area are considered essential to any R2 sensitive wildlife species for the WRNF.

The language and analysis of effects and determinations for sensitive species is different than that of language for determination of effects for threatened, endangered, and proposed species. The following is the language used for sensitive species (USDA Forest Service 2018a):

- No impact
- Beneficial impact
- May adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range-wide.
- Likely to result in a loss of viability on the planning area, in a trend to federal listing, or in a loss of species viability range-wide.

Figure 13. Vegetation Cover Types (FSVeg) within 2 Miles of I-70 MP 180 – 190



MONARCH BUTTERFLY (*DANAUS PLEXIPPUS*)

Monarch butterflies belong to the sub-family Danainae, which are dependent on various species of milkweed as host plants. Monarch butterflies use a variety of habitats including meadows, fields, roadsides, suburban parks and gardens. Adults lay their eggs on milkweed plants (*Asclepias* spp.) which provide the sole food source for larvae after they hatch. The monarch caterpillars (larvae) will frequently attach themselves to milkweed plants while they generate their chrysalis and undergo the metamorphic process in transforming to adult butterflies. The final generation of the monarch lifecycle (4th) migrates to over-wintering grounds in September or October where the butterflies spend the next several months (USDA Forest Service 2019).

Limiting factors for monarch butterflies include:

- **Availability of milkweed** and nectar plants is an important limiting factor for monarch butterflies.
- **Overwintering habitat** – Most of the adult population from eastern North America is concentrated in a small number of hectares in the overwintering grounds in Mexico, and is vulnerable to extreme weather events, fire, diseases and parasites, predation, and anthropogenic threats.
- **Migration** – Long distance migration exposes monarchs to extreme weather events and requires a continuous supply of breeding and feeding habitat from Mexico to Canada to complete the migratory cycle.

The principal threats to the species include:

- **Widespread and increasing use of herbicides and insecticides across North America** – Changing agricultural practices and land use patterns in central and eastern North America are resulting in widespread use of herbicides to sustain crops at the expense of all other competing plants, as a method of weed control along roadways, and to specifically eradicate milkweeds.
- **Breeding habitat loss** – The loss of breeding habitat through much of the United States has strongly influenced the decline in overwintering monarch population.
- **Overwintering habitat loss** – Conservation and management actions are needed to ensure the future of overwintering habitats for monarchs in California and Mexico.
- **Predation** – Black-headed grosbeaks and black-backed orioles feed extensively on monarchs at the overwintering sites in Mexico. Predation has occurred at a rate of up to 34,000 butterflies killed per day (Snook 1993). About 2 million monarchs (10% of the total colony) were eaten by birds over a single winter (Arellano-Guillermo et al. 1993). Black-eared mice (*Peromyscus melanotis*) also feed extensively on both live and dead monarchs (Glendinning 1993).
- **Climate change** – Climate change models suggest that changes in the monarch migration and breeding range may force monarchs to change their migratory patterns.

OCCURRENCE WITHIN THE STUDY AREA

Although potential habitat (e.g., mountain grassland) exists within the Study Area, no milkweed was observed which significantly reduces the likelihood of monarch occurrence. Meadow habitat at the

lower elevations with a substantial forb component have the potential to support monarchs and small stands of milkweed may occur adjacent to the roadway and trail.

Direct and Indirect Effects to the Monarch Butterfly

Grasslands and meadows with milkweed and preferred forbs adjacent to roads may provide habitat for monarchs (particularly at the lower elevations of the Study Area where milkweed is more likely to grow). The Proposed Action would remove approximately 23.9 acres of potential habitat. This habitat loss accounts for approximately 17.37% of the habitat type occurring within the project extent and only 0.32% of the habitat type within two miles of the project extent.

Cumulative Effects

None of the ongoing or reasonably foreseeable activities within this area, when combined with the Proposed Action, are likely to contribute to substantial negative long-term cumulative impacts to this species. Other activities within that area have similar minimal potential impacts to this species, primarily through changes to foraging habitat, include livestock grazing, logging, water management and development projects, and some dispersed recreational activities. Actions that reduce flowering forbs, including roadside spraying of weeds, can reduce foraging plants for monarchs, and as milkweeds can be common along roadsides, this could also impact reproduction host plants. Any impacts to this species are offset by the larger available habitat areas in the cumulative effects analysis area.

Determination of Effect and Rationale

In consideration of the aforementioned potential impacts, the Proposed Action **may adversely impact individuals, but is not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range-wide** for the monarch butterfly.

Western Bumblebee (*Bombus occidentalis*)

Prior to 1998, the Western bumble bee was both common and widespread throughout the western United States and western Canada. Since 1998, *B. occidentalis* has declined most dramatically from western and central California, western Oregon, western Washington, and British Columbia. Although absent from much of its former range, *B. occidentalis* is still found in isolated areas, primarily in the Rocky Mountains (Evans et al. 2008).

Bumble bees of this species are generalists that have short-tongues and forage on open flowers with short corollas. They also are nectar robbers and chew the base of flowers with long corollas to access the nectar (avoiding pollination). Foraging plants preferred include: *Melilotus* (sweet clover), *Cirsium* (thistle), *Trifolium* (white clover), *Centaurea* (knapweed), *Chrysothamnus,* (rabbitbrush), and *Eriogonum* (buckwheat) (Evans et al. undated).

Limiting factors for this bumble bee include:

- **Nesting sites** – primarily old rodent borrows on west-southwest slopes bordered by trees. Bumble bee populations are believed to correspond with rodents for this reason. A few nests have been reported above-ground such as in logs.
- **Hibernacula** – not a lot of information is known about this. One study, from 1968, found hibernacula on steep west-facing slopes.

- **Nectar and pollen** – pollen is directly correlated with the number new queens and thus future bumble bee population size.

The principal threat to the species is hypothesized to be due to an introduction of a novel pathogen strain of *Nosema bombi*. However, there are numerous apparent threats that remove the limiting factors for this species, such as:

- Habitat alteration – remove flowering sources, nesting sites, and hibernacula
- Livestock grazing – as animals remove flowering food sources, alter the vegetation community, and likely disturb nesting sites. Major threats that alter landscapes and habitat required by bumble bees include agricultural and urban development.
- Broad-spectrum herbicides used to control weeds - can indirectly harm bumble bees by removing the flowers that would otherwise provide the bees with pollen and nectar.
- Bumble bees are threatened by invasive plants and insects. The invasion and dominance of native grasslands by exotic plants may threaten bumble bees by directly competing with the native nectar and pollen plants that they rely upon.
- In the absence of fire, native conifers encroach upon many meadows, which removes habitat available to bumble bees (Evans et al. undated).

As bumble bee habitats become increasingly fragmented, the size of each population diminishes and inbreeding becomes more prevalent. Inbred populations of bumble bees show decreased genetic diversity and increased risk of decline (Evans et al. undated).

Occurrence within the Study Area

Bumble bee surveys were conducted within the Study Area in June 2018. Although potential habitat (e.g., mountain grassland, wetlands) exists within the Study Area, no western bumblebees were observed.

Direct and Indirect Effects to the Western Bumble Bee

Forested meadows adjacent to roads may be used as landing areas. The Proposed Action would permanently remove approximately 23.9 acres of landing area habitat. This habitat loss accounts for approximately 17.37% of the habitat type occurring within the project extent but only 0.32% of the habitat type within two miles of the project extent.

Cumulative Effects

None of the ongoing or reasonably foreseeable activities within this area, when combined with the Proposed Action, are likely to contribute to substantial negative long-term cumulative impacts to this species. Other activities within that area may also have similar minimal potential impacts to this species, primarily through changes to foraging habitat, including livestock grazing, or other surface-disturbing activities which may bury colonies or individuals, and change foraging opportunities. Actions that reduce flowering forbs, including livestock grazing or roadside spraying of weeds, can reduce foraging plants for bumblebees. Any impacts to this species are offset by the larger available habitat areas in the cumulative effects analysis area.

DETERMINATION OF EFFECT AND RATIONALE

In consideration of the aforementioned potential impacts, the Proposed Action **may adversely impact individuals, but is not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range-wide** for the western bumble bee.

BOREAL OWL (AEGOLIUS FUNEREUS)

Boreal owl distribution is associated with the forests of Alaska, Canada and the mountainous chain of the western United States. Within the western mountains, distribution is linked to subalpine forests largely dominated by Engelmann spruce and subalpine fir. In Colorado, most boreal owl locations exceed 10,000 feet (Hayward and Hayward 1993). Boreal owls have been documented on the WRNF. Boreal owls nest in cavities excavated by woodpeckers in mixed coniferous, aspen, Douglas-fir, and spruce-fir habitat types (Hayward and Hayward 1993). Nests are usually initiated by mid-April to the first of June, and young have usually fledged by early July after a 28 to 36 day nestling period. Foraging habitat has been documented in mature and older spruce/fir forests (Hayward 1994). They may forage day or night, but the majority of foraging occurs at night. Prey consists of voles, lemmings, mice, shrews, pocket gophers, squirrels, chipmunks, small birds, and insects. Boreal owls are generally year-round residents of a home range to which they show multiyear fidelity. They may concentrate activities at lower elevations during winter; however, these use-areas also overlap the summer range (Hayward and Hayward 1993).

OCCURRENCE WITHIN THE STUDY AREA

Potential habitat exists in the mature spruce-fir, mixed conifer, forested drainages, and meadows within the Study Area. Boreal owl surveys were conducted in late winter and early spring within the Study Area in 2017. Although the surveys confirmed the occurrence of suitable habitat, no boreal owls were found.

THREATS

The principal threat to this species is the removal of nest cavities (large trees and snags for nesting) and mature, mesic forests with high canopy closure and large downed woody material – essential habitat features for their primary prey species the southern red-backed vole (*Myodes gapperi*) (Hayward and Hayward 1993).

DIRECT AND INDIRECT IMPACTS TO THE BOREAL OWL

Mature and old growth spruce-fir and other conifer forests occur within the Study Area east of approximately MP 181.9. These forest stands, particularly the old growth spruce-fir forest, have the potential to provide nesting and foraging habitat for boreal owls. Although no boreal owls were documented during surveys conducted for this project, the species has been documented on the WRNF. The Proposed Action would result in the loss of approximately 1.1 acres of spruce-fir and 3.3 acres of lodgepole pine. This habitat loss accounts for approximately 0.02% of the conifer habitat occurring within two miles of the project extent.

CUMULATIVE EFFECTS

Forest activities near the Study Area include recreation and firewood gathering. The Proposed Action does not alter the impacts of these activities nor does it propose other habitat altering actions.

Continued development of mature conifer forest at nearby ski areas and on private property and recreation development within mature conifer forest on Town of Vail and Eagle and Summit County properties would add cumulatively to the impacts on boreal owls. There are no project-related cumulative effects

DETERMINATION OF EFFECT AND RATIONALE

Given the small area of spruce-fir effected, the Proposed Action **may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range-wide** for the boreal owl.

NORTHERN GOSHAWK (*ACCIPITER GENTILIS*)

In Colorado, the northern goshawk is considered an uncommon resident in foothills and mountains within the western portion of the state (Andrews and Righter 1992, Kingery 1998). It is considered to be a winter resident throughout its range, but some individuals winter outside their breeding areas and undertake short-distance migrations (Kennedy 2003). The goshawk has often been described as an old-growth species (Kennedy 2003), but this status has been heavily debated. Several reviews have concluded that while goshawks frequently use mature or older forests for nesting, they appear to be a forest generalist in terms of the types and ages of forest used for foraging and during the fledgling-dependency period (Reynolds et al. 1992, U.S. Fish and Wildlife Service 1998). These reviews note that goshawks seldom use young dense forests, likely due to insufficient space in and below the canopy to facilitate flight and prey capture. The northern goshawk prefers to nest in large hardwood trees 30-40 ft. above ground, primarily in quaking aspen and mixed conifer/aspen forests. They frequently select aspen and pine, and seldom select juniper, spruce, or fir for nest construction in Region 2 (most commonly aspen trees on the WRNF). Goshawks nest from April to June. Young fledge nests by late July or August. They hunt for prey in dense woodlands, forest clearings and open meadows from 7,000 to 11,000 ft elevation. Prey consists of birds and mammals (Andrews and Righter 1992, Kingery 1998). Although population trends for this species are difficult to determine there is no hard evidence of a significant decline in recent decades. There is, however, evidence that goshawk populations are probably declining in some areas primarily as a result of habitat alteration (especially logging) (NatureServe 2019).

OCCURRENCE WITHIN THE STUDY AREA

Northern goshawks are known to occur on the WRNF. Goshawk broadcast surveys (Joy et al. 1994) were conducted in suitable habitat within the Study Area on June 15-16, 2017. No goshawks were heard or observed.

DIRECT AND INDIRECT EFFECTS TO THE NORTHERN GOSHAWK

Goshawk habitat exists within proximity to the Study Area but only a few quaking aspen stands occur within 0.25 miles of the proposed roadway. Approximately 313.8 acres of aspen occur within proximity of the Study Area but none east of MP 184 and no mixed conifer occurs east of MP 181. Only 2.9 acres of quaking aspen forest types and no mixed conifer will be directly affected by the Proposed Action. That acreage comprises only 2.11% of the affected landscape and only 0.10% of aspen forest occurring within two miles of the Study Area.

CUMULATIVE EFFECTS

Forest activities near the Study Area include recreation and firewood gathering. The Proposed Action does not alter the impacts of these activities nor does it propose other habitat altering actions. Continued development of mature conifer forest at nearby ski areas and on private property and recreation development within aspen and mixed conifer forest on Town of Vail and Eagle and Summit County properties would add cumulatively to the impacts on goshawks. There are no project-related cumulative effects.

DETERMINATION OF EFFECT AND RATIONALE

If goshawks were present in the area and nests were not detected by biologist prior to implementation of the Proposed Action, the 2.9 acres of habitat loss **may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range-wide** for the northern goshawk.

OLIVE-SIDED FLYCATCHER (*CONTOPUS COOPERI*)

The olive-sided flycatcher is a neotropical migrant, with most of its breeding range in North America and its wintering grounds in Central and South America. There has been a significant population decline of about 3.5% per year since 1966 across its entire North American breeding range, amounting to a loss of about three-quarters of the population over the 30-year span (Sauer et al. 2004). Within its breeding range, which includes the western mountains of the U.S., much of Canada and Alaska, and scattered populations in the eastern U.S., it is primarily an inhabitant of coniferous forest (Altman et al. 2000) with 0-39% canopy cover (Verner 1980). They are a well distributed and relatively common breeding bird throughout montane portions of western Colorado (Kingery 1998). On National Forest System lands of the WRNF, they are most commonly found in spruce-fir forests and Douglas-fir forests where there is a significant remaining component of pre-settlement trees or super-canopy snags. Olive-sided flycatchers appear to have a preference for wooded edges along wetlands and open water where they forage for flying insects (Altman 1997, Altman et al. 2000).

OCCURRENCE WITHIN THE STUDY AREA

Avian surveys conducted July 5-6, 2017 detected two olive-sided flycatchers; both were singing males. One was detected within mature spruce-fir forest near MP 185 at Polk Creek at approximately 9,200 feet and the other was near MP 187.9 in spruce-fir south of the trail adjacent to Black Gore Creek and its riparian wetlands. While territory size estimates vary, nesting olive-sided flycatchers typically defend areas of approximately 100 acres (Altman et al. 2000).

DIRECT AND INDIRECT EFFECTS TO THE OLIVE-SIDED FLYCATCHER

Potential habitat occurs throughout the Study Area above approximately 181.9. The interspersion of mature spruce-fir with riparian and wetland habitat paralleling Black Gore, Miller, and Polk Creeks is particularly suitable foraging and nesting habitat for olive-sided flycatchers.

The Proposed Action would result in the loss of approximately 1.1 acres of spruce-fir and 3.3 acres of lodgepole pine. This habitat loss accounts for approximately 3.2% of the area affected by the Proposed Action and approximately 0.02% of the conifer habitat occurring within two miles of the project extent. The Proposed Action will not result in the loss of any of the riparian habitat within the Study Area.

CUMULATIVE EFFECTS

Forest activities near the Study Area include recreation and firewood gathering. The Proposed Action does not alter the impacts of these activities nor does it propose other habitat altering actions. Continued development of conifer forest at nearby ski areas and on private property and recreation development within mature conifer forest on Town of Vail and Eagle County owned properties would add cumulatively to the impacts on olive-sided flycatcher. There are no project-related cumulative effects.

DETERMINATION OF EFFECT AND RATIONALE

The Proposed Action **may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range-wide** for the olive-sided flycatcher. This is because of the potential for removal of perching and nesting habitat of individual olive-sided flycatchers within the small acreage of spruce-fir and lodgepole pine habitat to be affected by the action alternative, and possible increase in predation due to an edge-effect.

WHITE-TAILED PTARMIGAN (*LAGOPUS LEUCURUS*)

The white-tailed ptarmigan is found in alpine areas at or above timberline in North America (Braun 1993). This bird is predominantly found in rocky areas, krummholz, moist vegetation near snowfields and streams, and willow-dominated plant communities. In the winter they generally use willow-dominated basins where wind action allows accumulation of snow (Braun et al. 1976). Females may vertically migrate to winter in willow stands in subalpine basins and along water courses (Braun et al. 1976, Andrews and Righter 1992, Kingery 1998). They inhabit all alpine regions of Colorado except the Wet Mountains and Spanish Peaks (Kingery et al. 1998). Males generally winter above treeline in areas of short, exposed willow thickets, while females often winter below treeline in taller, denser willow thickets. Pair formation begins in late April when females return to breeding grounds. Areas mostly free from snow early in spring are used for breeding. Females select nest sites among rock fields or alpine grasses adjacent to sheltering and concealing rocks.

Many of Colorado's alpine areas are protected by wilderness designations and most ptarmigan summer habitat is inaccessible to substantive human impacts. White-tailed ptarmigan predominantly feed on buds, stems, and leaves, but will also consume insects. The most important feature of habitats used by ptarmigan is the presence of willow (*Salix* spp.), which is their primary food source from late fall through spring. Any activity that reduces the distribution and abundance of willow will likely have negative consequences to Ptarmigan (Hoffman 2006). Impacts to this species have largely come from winter habitat losses, attributable to high-altitude reservoir development, livestock grazing, an expanded elk population, road construction along stream courses, ski area development, and snowmobiling.

OCCURRENCE WITHIN THE STUDY AREA

No evidence of Ptarmigan has been detected on or around the Study Area during spring, summer, or winter field surveys and there is no suitable habitat within or adjacent to the Study Area. It is likely, however, the ptarmigans occur in suitable habitat (e.g., rocky tundra with low-growing alpine vegetation, high elevation willow cars) to the west and east of the Study Area at and above treeline.

DIRECT AND INDIRECT EFFECTS

Since there is no suitable habitat within or adjacent to the Study Area there will not be any direct or indirect effects on white-tailed ptarmigan.

CUMULATIVE EFFECTS

The most significant activity near the Study Area with the potential to affect ptarmigan is both summer and winter above-treeline recreation and ski area developments/expansions. The Proposed Action does not alter the impacts of these activities nor does it propose other habitat altering actions. There are no project-related cumulative effects.

DETERMINATION OF EFFECT AND RATIONALE

The Proposed Action would result in **no impact** on the white-tailed ptarmigan because it would not cause any additional direct or indirect impacts on habitat in alpine tundra, alpine willow cars, or other areas above treeline.

AMERICAN MARTEN (*MARTES AMERICANA*)

Martens occur in Colorado at elevations between 8,000 and 13,000 feet (Jr. 1984). In this elevational range, they inhabit late-successional Engelmann spruce-subalpine fir and lodgepole pine forests, alpine willow carrs, high-elevation riparian areas, and occasionally montane forests (Buskirk and Ruggiero 1994, Buskirk and Powell 1999). They are known to occur on the Holy Cross Ranger District of the WRNF in the all of these habitat types (J. Prusse, WRNF, per. comm.). A critical component of their habitat appears to be an abundance of complex physical structure near the ground, such as coarse woody debris, sweeping lower branches of trees, rock fields in forests, shrubs, herbaceous plants, and squirrel middens. Coarse woody debris provides important subnivean habitat in winter (Corn and Raphael 1992, Bissonette et al. 1997). Martens are generally absent from stands dominated by ponderosa pine or pinyon pine-Utah juniper. The average home range size for this species ranges from 247 to 3,500 acres (Buskirk and Ruggiero 1994, Buskirk and Powell 1999).

The main threat to martens is vegetation management of their typical forest interior habitat. Treatments that result in the development of early seral conditions dominated by the grass/forb structural communities decrease the available habitat, at least in the short-term. American martens are a true forest-interior adapted species (Buskirk and Ruggiero 1994, Bissonette et al. 1997). They forage in small open spaces within a forested area but have rarely been documented crossing any clearings larger than 300 feet in width (Bissonette et al. 1997).

Although it was not directly observed during surveys for this project, 50 sets of marten tracks were detected during winter snow track surveys as shown in **Figures 9 and 10.** Of these, most (29 detections) were located within mature spruce-fir near streams and at existing bridges (e.g., Transect 5, MP 184.4 and Transect 6, MP 184.9) but also within aspen adjacent to spruce-fir (Transect 2, MP 182.5), meadows adjacent to lodgepole pine (Transect 7, MP 186.6), and meadows adjacent to spruce-fir (Transect 2, MP 187.6).

DIRECT AND INDIRECT IMPACTS

The Proposed Action would impact a small amount of marten habitat. Mature and old growth conifer forests occur within the Study Area primarily east of MP 183. These forest stands, particularly the spruce-fir forest provide habitat for American martens. The Proposed Action would result in the loss

of approximately 1.1 acres of spruce-fir and 3.3 acres of lodgepole pine. This habitat loss accounts for approximately 3.2% of the affected landscape and only 0.02% of lodgepole, spruce-fir or mixed conifer forest occurring within two miles of the Study Area.

CUMULATIVE EFFECTS

None of the ongoing or reasonably foreseeable activities within this area, when combined with the Proposed Action, are likely to contribute to substantial negative long-term cumulative impacts to this species. Other activities within the cumulative effects area have similar minimal potential impacts to this species, primarily through changes to foraging habitat through recreation development and spruce beetle epidemics. Widespread and consistent snowmobiling activities, however, may have other indirect impacts on this species use of spruce-fir and lodgepole pine habitat types, and on microtine rodent prey bases. The Proposed Action would have very minor cumulative contributions to these impacts.

DETERMINATION AND RATIONALE

Implementation of the Proposed Action **may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range-wide** for American marten. This is primarily based on the potential of indirect disruption to foraging individuals and a small acreage of habitat loss; little disturbance to their habitats or prey base is likely to occur.

In addition:

1. The project has standards and wildlife design features (e.g., new crossing structures) which provide and maintain ecological components throughout the Study Area which will improve permeability of I-70 for American martens.
2. Additionally, the project is designed to avoid, or minimize effects to threatened Canada lynx and its prey through Southern Rockies Lynx Amendment direction, which benefits other species associated with similar habitat such as martens and their preferred prey.

HOARY BAT (LASIURUS CINEREUS)

The hoary bat is a wide-ranging, migratory species that occurs in Colorado in every season except winter. Based on acoustic monitoring surveys, on the WRNF hoary bats were found foraging from elevations of 7,350 to 9,910 feet in the summer and during fall migration (Siemers and Neubaum 2015). More bats were detected in the summer than in the fall, suggesting a higher occurrence of hoary bat habitat use than originally hypothesized. On the WRNF, foraging associations include: oak, sagebrush, mixed montane shrublands, aspen forest, subalpine meadow, and mixed conifer forests (Armstrong et al. 2011, Siemers and Neubaum 2015). They are also known to forage over water.

Hoary bats are solitary roosters. Live trees are considered the most important habitat components (Adams 2003, Reimer et al. 2010). Roost locations are typically adjacent to clearings and windbreaks. Hoary bats roost among the foliage, and the trees selected have leaves and branches 4-5 meters above ground but are clear below to allow direct flight to foraging grounds (Adams 2003). In the summer, males are more prevalent than the females; males emerge well into the night to aerially forage on insects, primarily moths. Predators of this species include owls and hawks (Armstrong et al. 2011).

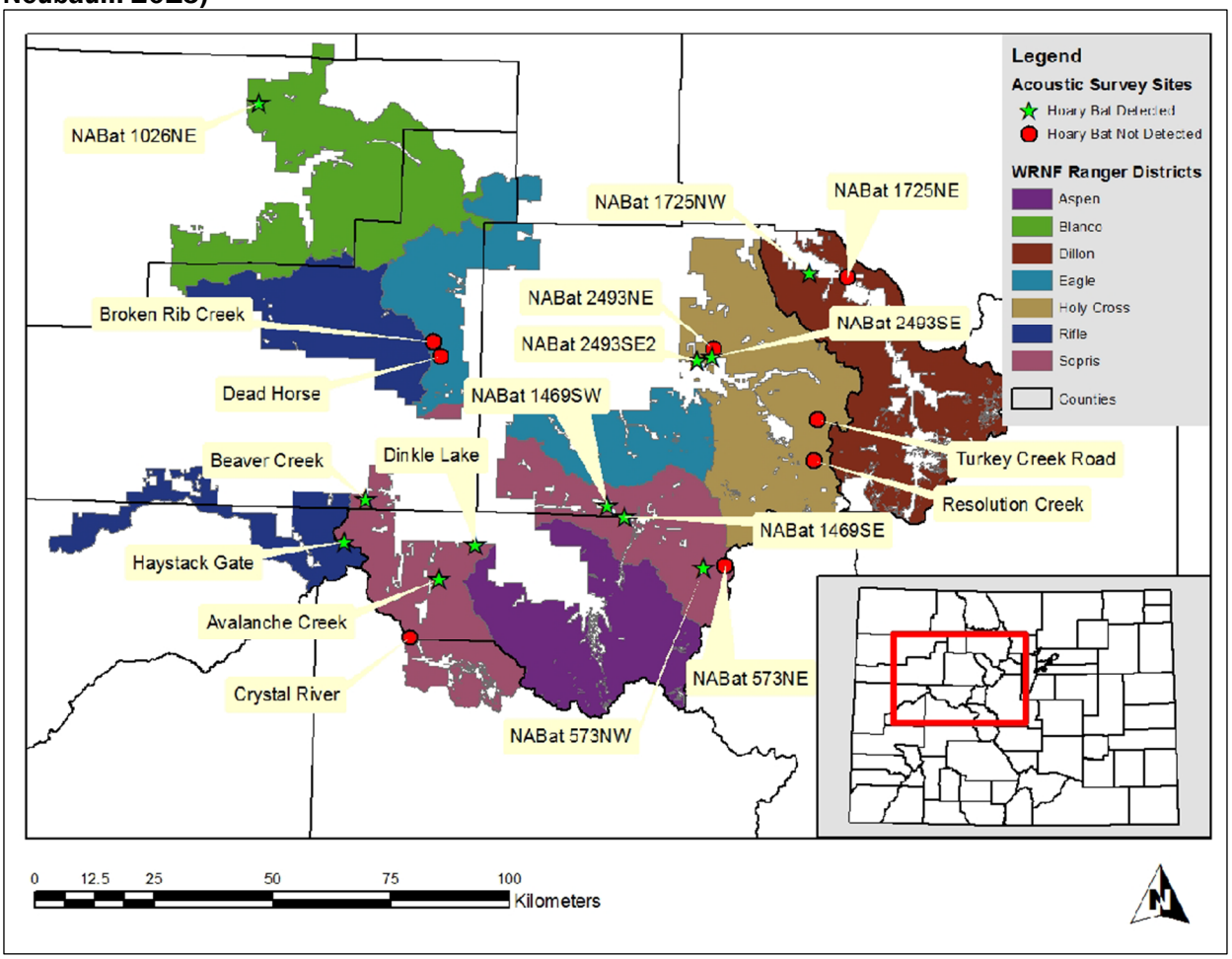
Occurrence within the Study Area

Suitable habitat, such as aspen and conifer cover types as well as forested edges, clearings, meadows, and deciduous riparian areas, exists across the Study Area. Acoustic surveys in 2015 found hoary bats in oak, sagebrush and mixed montane shrublands, aspen forest, subalpine meadow, and mixed conifer forest (Siemers and Neubaum 2015). Hoary bats were determined to be present at acoustic survey sites on the Holy Cross Ranger District by Siemers and Neubaum (2015) (**Figure 14**). Survey sites that detected hoary bats are not located within or near the Study Area.

Direct and Indirect Impacts to the Hoary Bat

Impacts to hoary bats may include decreased foraging habitats through vegetation removal, and the potential for disturbance to day-time roosting in trees near the highway and trail during construction, which could cause bats to flush in the day-time (when they could become susceptible to predation). Prey bases would not likely be affected. Impacts to bat foraging would be discountable (extremely unlikely to occur) due to the small scale of vegetation removal and large expanses of similar foraging habitat throughout the area.

Figure 14. Map of Hoary Bat Detections on the White River National Forest (from Siemers and Neubaum 2015)



DETERMINATION OF EFFECT AND RATIONALE

Implementation of the Proposed Action **may adversely impact individuals, but is not likely to result in a loss of viability in the planning area, nor cause a trend towards federal listing** for hoary bats. This is primarily based on the broad range of habitats occurring within the Study Area in which hoary bats may roost. Although the total acreage and relative proportion of habitat to be impacted under the Proposed Action is quite small and adequate suitable habitat occurs in the immediate landscape and across the WRNF, some individuals of this species may be affected. Pre-construction surveys will be conducted to detect hoary bat roosts. Any roosts found will be avoided.

PYGMY SHREW (*SOREX HOYI*)

The pygmy shrew is one of the smallest mammals in North America and occurs throughout the southern provinces of Canada, Alaska, New England, Appalachia, and a small portion of northern Colorado and southern Wyoming (Beauvais and McCumber 2006). The subspecies *S. h. montanus*, which is discontinuous from the more northern *S. h. hoyi*, is restricted to Colorado and Wyoming. Habitat affinities of this species are not well known, especially in Colorado where it is known from a limited number of locations (Fitzgerald et al. 1994). In Colorado, it is known from a diverse array of habitats including aspen-fir and spruce-fir forests, willow thickets, sphagnum bog, marsh surrounded by spruce-fir and lodgepole forest, and subalpine meadow with scattered spruce and fir (DeMott and Lindsey 1975, Pettus and Lechleitner 1963, Spencer and Pettus 1966, and Vaughan 1969 in Beauvais and McCumber 2006). (Pettus and Lechleitner 1963, DeMott and Lindsey 1975)(Pettus and Lechleitner 1963, DeMott and Lindsey 1975)(Pettus and Lechleitner 1963, DeMott and Lindsey 1975)(Pettus and Lechleitner 1963, DeMott and Lindsey 1975)(Pettus and Lechleitner 1963, DeMott and Lindsey 1975)

Pygmy shrews primarily eat small arthropods with larval insects (mainly Lepidoptera, followed by Diptera, Coleoptera, and Tipulidae) made up the bulk of the diet (68 percent of pygmy shrew stomach volume), followed by adult insects (mainly Coleoptera, followed by Carabidae, Lepidoptera, and Hemiptera; 22 percent), and spiders (10 percent) (Beauvais and McCumber 2006).

Twelve sites across the WRNF were sampled for the presence of pygmy shrews in 2009 (Siemers 2009). Prior to this effort, the elevation range for the pygmy shrew in Colorado was believed to be above 9,600 feet (Fitzgerald et al. 1994). Capture locations from the 2009 study in fact ranged from 9,600 feet to 11,180 feet. Nine pygmy shrews were captured in a variety of habitat types (e.g., willow riparian, subalpine meadow, spruce-fir woodland, subalpine mesic meadow with spruce-fir or aspen) at five different locations: Elliott Ridge, Peru Creek, Haystack Gate, Middle Thompson, and Ivanhoe. The elevation of these sites ranged from 9,600 to 11,180 feet. The greatest number of pygmy shrews (3) was found at the Middle Thompson site, which is approximately 10,000 feet in elevation. The captures at this site were dispersed among traps in both subalpine meadow and spruce-fir woodland. Only one site, Peru Creek, had pygmy shrew captures on different dates. No one pitfall trap at any site had more than one pygmy shrew capture.

Since the initial study, traps have been set at a total of 30 sites on the WRNF (Siemers 2012). As of September 2012, pygmy shrews have been captured at the following locations on the WRNF: Blair Mountain near the headwaters of Main Elk Creek (Rifle Ranger District); Bear Mountain near Marlin Mine along Saints John Creek (Dillon Ranger District); and Kobey Park (Aspen Ranger District) (Siemers 2012).

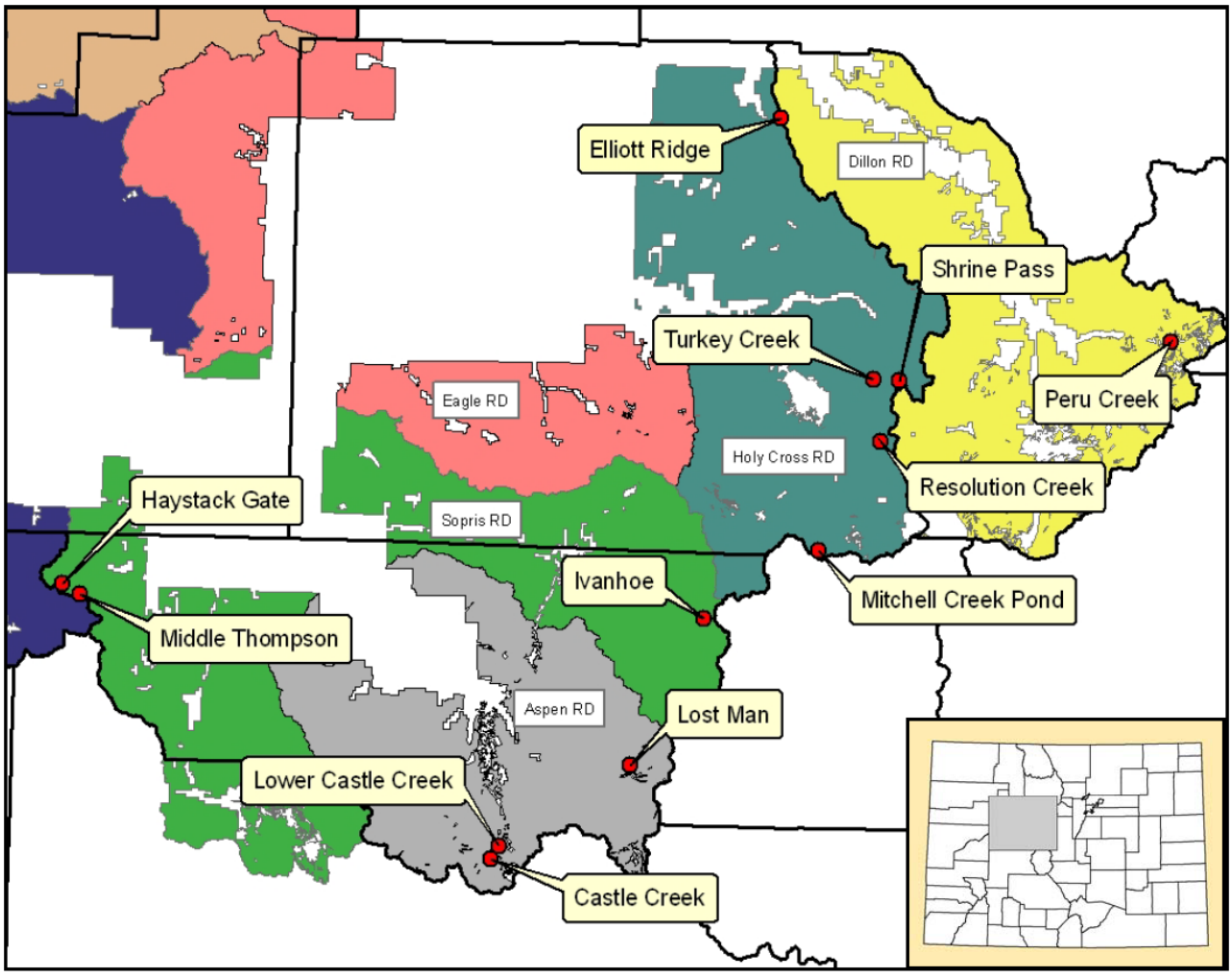
Occurrence within the Study Area

The average home range size for this species is estimated to be 0.25 acres (Beauvais and McCumber 2006). The closest location where shrew surveys were conducted and captured (**Figure 15**) was at Peru Creek (39.599278, -105.856585) (Siemers 2013) which is approximately 19.8 miles from the Study Area. The habitat type at this site consists of willow riparian shrubland surrounded by spruce-fir woodland. Within the project area, potential habitat for this species is found in moist habitat types above 9,600 feet (MP 185.4) – spruce-fir, mixed conifer, forested meadows and wetlands, and riparian areas.

Incomplete Information

Surveys for the pygmy shrew were not conducted within the Study Area, partly due to the low density and difficulty in detection, therefore occurrence could not be confirmed in the project area. As mentioned above, presence is likely based on habitat affinity described in Siemers (2012). Additionally, the population status for the pygmy shrew is not available throughout most of its range (Beauvais and McCumber 2006).

Figure 15. Trapping Sites on the White River National Forest, Divided by Ranger District (RD). Inset map depicts figure location in Colorado. (From Siemers 2009)



DIRECT AND INDIRECT IMPACTS

Implementation of the Proposed Action occurring in mesic vegetation types, primarily in spruce-fir forests and near subalpine wetlands, could directly impact this species. Given how small this shrew is, avoidance of impact would be very difficult. After construction, mitigation measures such as small mammal shelves within water carrying culverts and new crossing structures above 9,600 feet may improve dispersal across I-70 and reduce barrier effects. Given the limited extent of the project within suitable habitat, measurable impacts to pygmy shrew populations are unlikely.

CUMULATIVE EFFECTS

None of the ongoing or reasonably foreseeable activities within this area, when combined with the Proposed Action, are likely to contribute to substantial negative long-term cumulative impacts to this species. Other activities within the cumulative effects area have similar minimal potential impacts to this species, primarily through changes to foraging habitat through recreation management, livestock grazing, water management and development projects, over-the-snow winter sports (which can crush subnivean habitats and alter foraging opportunities, refugia, and fecundity), and spruce beetle epidemics. This Proposed Action would have minor cumulative contributions to these impacts.

DETERMINATION OF EFFECT AND RATIONALE

Implementation of the Proposed Action **may adversely impact individuals, but is not likely to result in a loss of viability in the planning area, nor cause a trend towards federal listing** for pygmy shrews. This is primarily based on the potential for indirect impacts during construction and a small amount of direct habitat loss. Abundant intact pygmy shrew habitat occurs across the Study Area and within the Holy Cross Ranger District.

Avoidance measures would reduce effects to the pygmy shrew. Existing woody-debris would be retained within the project extent per the recommendations in the Forest Plan, which could lead to a retention of subnivean habitat and nesting sites (this would benefit other sensitive species as well (e.g., American marten).

BOREAL WESTERN TOAD (*ANAXYRUS BOREAS BOREAS*)

Boreal toads live in a wide range of habitats including wetlands, forests, woodlands, sagebrush, meadows, and floodplains in the mountains and valleys of Colorado and other mountain states (Livo and Yeakley 1997, Keinath and Bennett 2000, Loeffler 2001). While they primarily use wetland habitats, which is required for breeding and tadpole development, boreal toads may be observed in other habitats during dispersal to and from breeding sites.

This species has not been recorded below 6,000 feet in Region 2, and generally occurs from 7,500 to 12,000 feet (Hammerson 1999). The boreal toad was once widely distributed in Region 2 from the mountains of southeastern Wyoming through the Rocky Mountains in Colorado to the San Juan Range in northern New Mexico (USFWS 1995). Their populations declined dramatically in the late 1990's due to chytrid fungus (*Batrachochytrium dendrobatidis*).

OCCURRENCE WITHIN THE STUDY AREA

The lakes, wetlands, and ponds across the Study Area provide suitable habitat for this species; while it was not observed during surveys, its presence is assumed. Species-specific surveys for boreal toad

have not been conducted for this project. There is one known, extant boreal toad breeding site in the vicinity of the Study Area. This population is established along the banks of Gore Creek in East Vail. The breeding habitat includes a large pond and beaver created wetlands outside the Study Area. There are no other known populations, breeding or otherwise of boreal toads within or in proximity to the Study Area.

DIRECT AND INDIRECT IMPACTS

The Proposed Action is unlikely to affect any known or potential boreal toad breeding habitat, but could affect dispersing individuals. Project design features will include measures intended to eliminate, to the extent possible, any impacts to wetland/riparian habitat which would protect all potential breeding habitat found within the Study Area. There is still some risk of impacting dispersing individuals to these habitats during times of migration.. Suitable habitat does exist within or near the Study Area and therefore, this species could be affected by the Proposed Action. As such, construction activity impacts (e.g., direct mortality of individuals in clearance areas and along access roads, direct effects) or impaired habitat connectivity via reduced forest cover could impact individuals. The construction process may therefore result in direct impacts to toads (through trampling or excavation activities). Indirect impacts would also include increased sediment mobilization through wetland habitats, which could negatively impact down-gradient boreal toad habitats.

CUMULATIVE EFFECTS

Activities in this area which may impact boreal toads include grazing management, surface activities associated with motorized travel, recreation, and water development and potential water depletions. Grazing can result in loss of riparian vegetation (foraging habitat and cover) and trampling of toads and egg masses. Motorized travel of all types may result in mortality to individuals moving from wetlands into upland areas. Toad populations, however, are more likely to be regulated by chytrid fungus infection rates. The Proposed Action is unlikely to contribute extensively to negative cumulative impacts for this species.

DETERMINATION AND RATIONALE

Implementation of the Proposed Action **may adversely impact individuals, but is not likely to result in a loss of viability in the planning area, nor cause a trend towards federal listing** for the boreal toad. This is based on the possibility of individual mortality by construction, indirect effects on breeding and dispersal habitat, and the low likelihood of water quality impacts. No aquatic habitat loss would be associated with the project.

NORTHERN LEOPARD FROG (*LITHOBATES PIPIENS*)

The northern leopard frog occurs throughout much of Colorado, although most occurrences are in the western half of the state (Hammerson 1999). In Colorado northern leopard frogs range from below 3,500 feet in northeastern Colorado to above 11,000 feet in southern Colorado (Hammerson 1999). Merrell and Rodell (1968) describe three major habitat divisions: winter habitat (lakes, streams and ponds), summer habitat (post-breeding areas including upland habitats for feeding), and egg/tadpole habitat (shallow breeding ponds). Although aquatic habitats are a central feature in the frog's cycles of life, it may range a considerable distance from natal and breeding areas to a variety of other habitat types. Suitable breeding habitat for the northern leopard frog on the Forest includes streams, natural lakes and ponds, glacial kettles, stock ponds and reservoirs, marshes and wetlands.

Post-breeding habitat is typically along the edges of these features as well as the surrounding upland habitats (generally within 2 miles). Wintering habitat would be found in streams, ponds, and lakes that do not completely freeze during winter and do not have substantial populations of predaceous fish (Smith and Keinath 2007).

Larvae of the northern leopard frog are primarily vegetarian gaining sustenance by filtering free-floating algae from their surrounding waters (Smith and Keinath 2007). They have also been observed feeding on dead animal material including conspecifics. Adults and sub-adults are carnivorous and primarily insectivorous, although they have been described as generalists that will "consume anything that moves and is small enough to swallow." Beetles and grasshoppers may make up a large portion of their diets. Other common prey includes flies, wasps and bees, and spiders.

Loss or degradation of breeding habitat can occur through changes in hydrology or water quality. Other factors include habitat fragmentation, predation, disease, sensitivity to UV radiation, and recruitment into the population.

Occurrence within the Study Area

This species was not observed during survey efforts. Since 2003, USFS biologists have conducted extensive surveys for amphibians across the Eagle/Holy Cross Ranger District. To date, northern leopard frogs have not been documented on the Eagle/Holy Cross Ranger District. In Eagle County, leopard frogs have a very limited distribution based on only a few historical records. The most recent observation of northern leopard frogs in Eagle County is from a 1996 record on the Colorado River approximately 3.5 km north of Dotsero near the Garfield County border (J. Logan, CPW, pers. comm.).

Direct and Indirect Impacts

Although leopard frogs are not known to occur within the Study Area, wetlands and adjacent uplands in areas supporting suitable leopard frog habitats may be affected by the Proposed Action. Construction activity may result in localized direct impacts to frogs (through trampling or excavation activities). Indirect impacts could also include increased sediment mobilization through wetland habitats, which could negatively impact down-gradient habitats. Given the implementation of best management practices for sediment control, the likelihood of indirect impacts is likely to be minor, and the scale of direct impacts is also very small. Long-term trail use could also directly impact dispersing frogs. No naturally occurring breeding or overwintering areas (ponds) are expected to be impacted but there will be direct impacts to small sediment control ponds adjacent to the roadway.

Cumulative Effects

Activities in this area which may impact northern leopard frogs include grazing management, surface activities associated with motorized travel, recreation, and water development. Grazing can result in loss of riparian vegetation (foraging habitat and cover) and trampling of frogs and egg masses. Motorized travel of all types may result in mortality to ividuals moving from wetlands into upland areas. The Proposed Action is unlikely to contribute to negative cumulative impacts for this species.

Determination and Rationale

Implementation of the Proposed Action will have **no impact** on northern leopard frogs. This is based on the absence of leopard frogs in the Study Area and the Eagle/Holy Cross Ranger District.

"Blue Lineage" Colorado River Cutthroat Trout (*Oncorhynchus clarkii* c.f.

PLEURITICUS)

Recent genetic and meristic studies (e.g., Metcalf et al. 2012, Bestgen et al. 2013, Bestgen et al. 2019) have shown that two lineages of Cutthroat Trout are native in the greater Colorado River Basin. One of these, the Green Lineage, is being managed as a threatened species under the ESA. The Blue Lineage Colorado River Cutthroat Trout (CRCT) is being managed as a USFS sensitive species.

The blue lineage CRCT is native to the White River, Yampa River, Green River, and downstream Colorado River drainages (Bestgen et al. 2013, Bestgen et al. 2019). It is a cold water fish, and is associated with streams with clear, cool water and gravel bottoms. In general, habitat requirements of this subspecies are similar to those of other cutthroat trout. The decline of genetically pure, native Colorado River cutthroat populations was caused by massive introductions of non-native trout. Brook and brown trout introductions have caused competitive displacement. In streams, CRCT are quite susceptible to angling pressure and are at a disadvantage when competing with other species of trout that are more difficult to catch. Non-native trout such as brook trout (*Salvelinus fontinalis*) and rainbow trout (*Oncorhynchus mykiss*), however, have displaced even unexploited populations of these cutthroats. In other areas, habitat destruction, toxic mine wastes, water diversions, logging, road building, and overgrazing have adversely affected this subspecies. Whirling disease, a parasitic infection of trout and salmon caused by a microscopic amoeba has not been identified in any wild populations of CRCT. Genetic purity of this subspecies is graded A (most pure) through F (least pure), designating various degrees of hybridization. Pure grades are found only in a few, small, isolated headwater streams.

Spawning in the region may extend from April through July, with the peak typically occurring in May and June. Eggs hatch in the spaces between gravels, where the fry remain until emerging from August through October (depending upon the time of spawning and water temperature). Juveniles may require three years to mature to adults (Dare et al. 2011).

OCCURRENCE WITHIN THE STUDY AREA

CRCT are found only within limited areas across their historic range, mainly within headwater streams or lakes isolated from lower reaches by impassable barriers to upstream fish movement. A recently completed status assessment for CRCT suggests that CRCT occupy only 14 percent of their former range, while only 8 percent of its former range is currently occupied with "conservation populations" of CRCT (Young 2008). These conservation populations listed as those that are naturally reproducing and recruiting populations with genetic material which is less than 10 percent hybridized with other species or subspecies (Young 2008). Core conservation populations are assigned to CRCT populations believed to be greater than 99 percent pure. Within the Study Area, conservation populations have been recorded in Pitkin (**Figure 16**), Polk (**Figure 17**), and Miller Creeks (**Figure 18**) (K. Bakich, CPW, pers. comm.) which are tributaries of Black Gore Creek. These creeks are known to contain CPW Core Conservation Population of Blue Lineage Colorado River Cutthroat Trout. A fish barrier is currently in place in each of these creeks at I-70 to prevent non-native fish (e.g., brook trout and rainbow trout) from migrating upstream from the confluence with Black Gore Creek.

Direct and Indirect Effects

As described above, CRCT occur in several of the drainages within the Study Area. Project construction will remove vegetation and expose soil, and have the potential to alter patterns of surface water drainage, which could increase the possibility for sediment delivery into drainages used by this species. There is a chance that the Proposed Action could degrade suitable spawning habitats within or downstream of the trail crossing, but implemented soil erosion-control measures and best management practices would contain sediment and minimize these effects.

The Proposed Action would impact a small amount of CRCT habitat. The Proposed Action would have the potential to effect approximately 0.2 acres of open water habitat. This habitat loss accounts for approximately 3.2% of the affected landscape and only 0.01% of open water habitat occurring within two miles of the Study Area.

Figure 16. Pitkin Creek at I-70

Figure 17. Polk Creek Runs Under I-70 to its Confluence with Black Gore Creek

Figure 18. I-70 is Bridged over Miller Creek

CUMULATIVE EFFECTS

Continued human population growth and associated developments have the potential to affect aquatic habitats from increased runoff rates and the amount of sedimentation and contamination that would occur in area streams. Rapid runoff rates also cause stream channelization, which, along with decreases in water quality, could reduce fishery habitat values. However, none of the ongoing or reasonably foreseeable activities within this area, when combined with the Proposed Action, are likely to contribute to substantial negative cumulative impacts to this species. Other activities within the area may have similar minimal potential impacts to this species, primarily through direct disturbances (such as earthmoving activities) or herbivory (livestock grazing) near waterbodies, as well as water development and potential water depletions.

DETERMINATION AND RATIONALE

Implementation of the Proposed Action would result in a determination of **may adversely impact individuals, but is not likely to result in a loss of viability in the planning area, nor cause a trend towards federal listing** for the Blue Lineage Colorado River Cutthroat Trout. This is based on the low likelihood of water quality and spawning substrate impacts, and no aquatic habitat loss would be associated with the project.

USFS REGION 2 SENSITIVE SPECIES DETERMINATION SUMMARY

Table 11 presents a summary of the effects determinations for all USFS R2 sensitive species that are known or suspected to occur in the Study Area.

MIGRATORY BIRDS

Neotropical migratory landbirds are those avian species that breed in the U.S. and winter south of the border in Mexico, Central, and South America. Resident landbirds include those that remain during the winter period, or move to winter habitats that occur primarily within the U.S. Landbirds include many of our passerine songbirds, hawks, owls and woodpeckers, but do not include waterfowl, shorebirds, or colonial water birds (e.g. coots and rails). Several landbird species may be experiencing population declines and have become an issue of international concern (Terborgh 1992, Finch et al. 1993, Dobkin 1994).

On January 10, 2001, 13186, 66 Fed. Reg. 3853 (2001) was signed and entitled "Responsibilities of Federal Agencies to Protect Migratory Birds." The Executive Order directs agencies to take certain actions to further comply with the migratory bird conventions, the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and other pertinent statutes. The Executive Order states that "environmental analysis of Federal actions, required by NEPA or other established environmental review processes, shall evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of special concern." The Executive Order further directs action agencies to develop and implement a MOU with the USFWS that promotes the conservation of migratory birds. This MOU was finalized and signed by the USFS and USFWS in December 2008 (USDA Forest Service 2009). The MOU and additional correspondence by the USFS Washington Office outlines commitments and responsibilities intended to reduce the direct, indirect and cumulative effects of land management activities on migratory birds, including those dealing with habitat modification. In 2016 (USDA Forest Service 2016), the USFS Chief signed an MOU extension with the Fish and Wildlife Service of the 2008 MOU to promote the conservation of migratory birds.

Table 11. USFS Region 2 Sensitive Species Determination Summary - Animals

COMMON NAME	SCIENTIFIC NAME	STATUS	DETERMINATION*
Monarch Butterfly	*Danaus plexippus*	Sensitive	MAII
Western Bumblebee	*Bombus occidentalis*	Sensitive	MAII
American Three-toed Woodpecker	*Picoides dorsalis*	Sensitive	MAII
Boreal Owl	*Aegolius funereus*	Sensitive	MAII
Northern Goshawk	*Accipiter gentilis*	Sensitive	MAII
Olive-Sided Flycatcher	*Contopus borealis*	Sensitive	MAII
White-tailed Ptarmigan	*Lagopus leucurus*	Sensitive	No Impact
American Marten	*Martes americana*	Sensitive	MAII
Hoary Bat	*Lasiurus cinereus cinereus*	Sensitive	MAII to No Impact†
Pygmy Shrew	*Sorex hoyi*	Sensitive	MAII
Boreal Toad	*Anaxyrus boreas boreas*	Sensitive	MAII
Northern Leopard Frog	*Lithobates pipiens*	Sensitive	No Impact
Colorado River Cutthroat Trout	*Oncorhynchus clarkii pleuriticus*	Sensitive	MAII

* MAII – "may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range-wide."
† If pre-construction surveys are conducted to detect bat roosts, and these can either be avoided, or if none occur, then a determination of "no impact" is likely warranted.

On January 10, 2001, 13186, 66 Fed. Reg. 3853 (2001) was signed and entitled "Responsibilities of Federal Agencies to Protect Migratory Birds." The Executive Order directs agencies to take certain actions to further comply with the migratory bird conventions, the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and other pertinent statutes. The Executive Order states that "environmental analysis of Federal actions, required by NEPA or other established environmental review processes, shall evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of special concern." The Executive Order further directs action agencies to develop and implement a MOU with the USFWS that promotes the conservation of migratory birds. This MOU was finalized and signed by the USFS and USFWS in December 2008 (USDA Forest Service 2009). The MOU and additional correspondence by the USFS Washington Office outlines commitments and responsibilities intended to reduce the direct, indirect and cumulative effects of land management activities on migratory birds, including those dealing with habitat modification. In 2016 (USDA Forest Service 2016), the USFS Chief signed an MOU extension with the Fish and Wildlife Service of the 2008 MOU to promote the conservation of migratory birds.

The evaluation of agency actions needs to:

- Pursue opportunities to restore or enhance the composition, structure, and juxtaposition of migratory bird habitats in the project area;

- Consider approaches to the extent practical for identifying and minimizing take that is incidental to otherwise lawful activities including:
    1. Altering the season of activities to minimize disturbances during the breeding season;
    2. Retaining snags for nesting structures where snags are underrepresented;
    3. Retaining the integrity of breeding sites, especially those with long histories of use;
    4. Giving due consideration to key wintering areas, migration routes and stop-over sites;
    5. Minimizing or preventing the pollution or detrimental alteration of environments utilized by migratory birds; and
    6. Coordinating with USFWS when planning projects that are likely to have negative impacts on migratory bird populations and cooperating in developing approaches that minimize negative impacts and maximize benefits to migratory birds.

For compliance with the Migratory Bird Treaty Act, the USFS and the USFWS agreed that instead of analyzing project-related impacts to all migratory birds, only birds listed in state bird conservation plans need to be addressed. Currently all of these species are listed as USFS Sensitive and have been addressed in the BE and Technical Report of this document.

Additionally, Wildlife Standard 5 on page 2-17 of the WRNF Forest Plan requires protecting known active and inactive raptor nests areas. Raptors classified as non- sensitive species have been documented in the Study Area and have had protective buffers placed around the nests.

To the extent practical, the Proposed Action has been designed to minimize incidental take through project design features. These features protect known raptor breeding sites, retain snags, and ensure that other priority species breeding areas would be protected.

This section considers migratory bird species that have been identified as candidates for conservation priority by at least one of the following five lists: (1) USFWS Birds of Conservation Concern list for the Southern Rockies/Colorado Plateau Bird Conservation Region 16; (2) Colorado Partners in Flight Bird Conservation Plan for the Southern Rocky Mountains Physiographic Area (Area 62); (3) the Colorado State Threatened and Endangered list; (4) species designated as Sensitive by the U.S. USFS Rocky Mountain Region; (5) species listed under the federal ESA; and (6) species designated as management indicator species on the WRNF. **Table 12** lists migratory birds that have been identified as candidates for conservation priority.

Table 12. Migratory Bird Species That Have Been Identified as Candidates for Conservation Priority

Analysis Group	Species	Effect of Proposed Action
Riparian/wetlands	American Bittern, **American dipper**, bald eagle, **black swift**, ***cordilleran flycatcher***, **lazuli bunting**, **MacGillivray's warbler**, **mallard**, **northern harrier**, short-eared owl, southwestern willow flycatcher, willet, Wilson's phalarope, **Wilson's warbler**, western yellow-billed cuckoo	No effect
Snag & Cavity Dependent	**American three-toed woodpecker**, **boreal owl**, flammulated owl, **hairy woodpecker**, Lewis's woodpecker, **mountain bluebird**, ***red-naped sapsucker***, ***violet-green swallow***, **Williamson's sapsucker**	MAII
Ponderosa Pine	Band-tailed pigeon, Grace's warbler, Merriam's turkey, **northern goshawk**	No effect
Pinyon-Juniper	Black-throated gray warbler, gray vireo, pinyon jay	No effect
Mixed-conifer	***Dusky grouse***, Hammond's flycatcher, Mexican spotted owl	MAII
Sagebrush	Brewer's sparrow, ferruginous hawk, Gunnison sage grouse, loggerhead shrike, sage sparrow	No effect
Mountain Shrub	***Broad-tailed hummingbird***, Columbian sharp-tailed grouse, **green-tailed towhee**, **Virginia's warbler**	MAII
Rock/cliff	**Golden eagle, peregrine falcon**, prairie falcon	No effect
Alpine Tundra	American pipit, brown-capped rosy finch, white-tailed ptarmigan	No effect
Aspen	Purple martin	No effect
Grasslands	Ferruginous hawk, Swainson's hawk, western burrowing owl	No effect

Note: Species in bold may occur in the Study Area; species in *bold italics* was documented during surveys

Additionally, the USFWS developed a list of birds of conservation concern based on Bird Conservation Regions (BCR; refer to **Table 13**). There are 37 BCRs in North America with four of these occurring at least partially in Colorado. The Project Area occurs within the Southern Rockies Colorado Plateau BCR 16, which encompasses portions of Colorado, New Mexico, Arizona, Utah, and Wyoming.

Table 13. USFWS Birds of Conservation Concern for BCR 16

Species	General Habitat	Occurrence in Study Area	Effect of Proposed Action
Northern Harrier	Grasslands	Possible rare fall migrant	No effect
Swainson's Hawk	Grasslands	No	No effect
Ferruginous Hawk	Prairie	No	No effect
Golden Eagle	Cliffs/grasslands	Yes Project Area part of large hunting range; no known local nests	No effect
Peregrine Falcon	Cliffs	Yes Project Area may be part of large hunting range; 2 known eyries in the area; no cliffs to be affected	No effect
Prairie Falcon	Cliffs	No	No effect
Gunnison Sage-grouse	Sagebrush	No	No effect
Snowy Plover	Shorelines	No	No effect
Mountain Plover	Prairie	No	No effect
Solitary Sandpiper	Shorelines	No	No effect
Marbled Godwit	Wetlands	No	No effect
Wilson's Phalarope	Waterbodies/Shorelines	No	No effect
Yellow-billed Cuckoo	Deciduous Riparian	No	No effect
Flammulated Owl	Ponderosa pine/snags	No	No effect
Burrowing Owl	Plains/grasslands	No	No effect
Short-eared Owl	Parks/grasslands	No	No effect
Black Swift	Waterfalls/wet cliffs	No	No effect
Lewis's Woodpecker	Riparian Cottonwood	No	No effect
Williamson's Sapsucker	Montane forests/snags	Possible but not detected during surveys	MAII

Species	General Habitat	Occurrence in Study Area	Effect of Proposed Action
Gray Vireo	Oak woodlands/scrub	No	No effect
Pinyon Jay	Pinyon/Juniper	No	No effect
Bendire's Thrasher	Rare spp. of arid areas	No	No effect
Crissal Thrasher	No records in CO	No	No effect
Sprague's Pipit	No records in CO	No	No effect
Virginia's warbler	Riparian scrub	Yes, in lower elevation montane shrublands but none detected during surveys	No effect
Black-throated Gray Warbler	Oak scrub/riparian	No	No effect
Grace's Warbler	Ponderosa pine	No	No effect
Sage Sparrow	Sagebrush	No	No effect
Chestnut-collared Longspur	Plains	No	No effect

Note: Other migratory birds are considered individually in this document as R2 sensitive species

Impact Summary

As shown in **Tables 12** and **13**, based on the location of the project, the type of project, and the conservation measures proposed, it has been determined that this project will have **no effect** on most migratory birds but **may adversely impact individuals** of some migratory bird species**, but not likely to result in a loss of viability in the Study Area, nor cause a trend toward federal listing.** These effects are largely due to some direct habitat loss and temporary avoidance of the area during construction.

PLANTS

Methods

Prior to conducting a field visit, numerous sources of data were reviewed to gain a general understanding of the ecology of the area. These sources included the CPW, CNHP, and USFWS websites; data supplied by USFS; aerial photographs; topographic maps; existing reports; and other relevant data.

A qualified botanist conducted pedestrian surveys of the Study Area on multiple days in August, September, and October 2018 to collect information regarding the general ecology of the area and to

identify potential rare plant habitat. All nomenclature presented follows that used by the USFS (USDA USFS 2018c).

THREATENED, ENDANGERED, PROPOSED, AND SENSITIVE (TEPS) SPECIES CONSIDERED AND ANALYZED

Based on information provided by the WRNF, the list of TEPS plants that could be affected by the project include a total of 34 species (USDA USFS 2018c). This includes four that are listed by USFWS under the ESA as threatened and 30 listed as sensitive by USFS. These are listed in **Table 14**. The 20 species bolded in the table have suitable habitat in or near the Study Area, and are carried forward for impact analysis. A summary of the potential impacts to those species that may be affected follows the tables.

Table 14. Source of Mapping Data for Sensitive Animal Species Evaluated

COMMON NAME	SCIENTIFIC NAME	KNOWN (K) OR SUSPECTED (L) TO BE PRESENT ON WRNF LAND[2]	GENERAL HABITAT	SUITABLE HABITAT PRESENT?	RATIONALE FOR EXCLUSION FROM ANALYSIS[3]
USFWS Threatened Plants					
Penland alpine fen mustard	*Eutrema penlandii*	K	Alpine wetlands	No	No alpine habitat
Debeque phacelia	*Phacelia scopulina* var. *submutica*	K	Bare, clayey steep slopes	No	Too high in elevation
Colorado hookless cactus	*Sclerocactus glaucus*	L	Desert shrub	No	No desert shrub; too high in elevation
Ute ladies'-tresses orchid	*Spiranthes diluvialis*	K	Wetlands and floodplains	No	Too high in elevation
USFS Sensitive Non-Vascular Plants					
Sphagnum	***Sphagnum angustifolium***	**K**	**Wetlands, mainly fens**	**Yes**	**Possible occurrence**
Baltic sphagnum	***Sphagnum balticum***	**L**	**Wetlands, mainly fens**	**Yes**	**Possible occurrence**
USFS Sensitive Ferns and Allies					
Triangle lobe moonwort	***Botrychium ascendens***	**K**	**Open slopes**	**Yes**	**Possible occurrence**
Narrowleaf grapefern	***Botrychium lineare***	**K**	**Open slopes and forest edges**	**Yes**	**Possible occurrence**
USFS Sensitive Monocots					

Common Name	Scientific Name	Known (K) or Suspected (L) to be present on WRNF land[2]	General Habitat	Suitable habitat present?	Rationale for exclusion from analysis[3]
Lesser panicled sedge	***Carex diandra***	**K**	**Wetlands, mainly fens**	**Yes**	**Possible occurrence**
Livid sedge	***Carex livida***	**L**	**Wetlands, mainly rich fens**	**Yes**	**Possible occurrence**
Yellow lady's slipper	***Cypripedium parviflorum***	**K**	**Aspen or ponderosa pine/Douglas fir forest**	**Yes**	**Possible occurrence**
Giant helleborine	*Epipactis gigantea*	L	Sandstone seeps and springs	No	Elevation too high
Whitebristle cottongrass	***Eriophorum altaicum var. neogaeum***	**K**	**Wetlands, mainly fens**	**Yes**	**Possible occurrence**
Chamisso's cottongrass	***Eriophorum chamissonis***	**K**	**Wetlands, mainly fens**	**Yes**	**Possible occurrence**
Slender cottongrass	***Eriophorum gracile***	**K**	**Moist alpine and wetlands (mainly fens)**	**Yes**	**Possible occurrence**
Simple bog sedge	***Kobresia simpliciuscula***	**K**	**Wetlands, mainly fens**	**Yes**	**Possible occurrence**
Porter feathergrass	***Ptilagrostis porteri***	**K**	**Wetlands, mainly fens**	**Yes**	**Possible occurrence**
USFS Sensitive Dicots					
Siberian sea thrift	*Armeria maritima spp. sibirica*	K	Alpine	No	No alpine habitat
Park milkvetch	***Astragalus leptaleus***	**K**	**Moist meadows and wetland edges**	**Yes**	**Possible occurrence**
Smooth northern-rockcress	*Braya glabella*	K	Alpine	No	No alpine habitat
Clawless draba	*Draba exunguiculata*	K	Alpine	No	No alpine habitat
Gray's draba	*Draba grayana*	K	Alpine	No	No alpine habitat
Weber's draba	*Draba weberi*	K	Alpine	No	Elevation too low

Common Name	Scientific Name	Known (K) or Suspected (L) to be present on WRNF land[2]	General Habitat	Suitable habitat present?	Rationale for exclusion from analysis[3]
Roundleaf sundew	***Drosera rotundifolia***	**L**	**Wetlands, mainly acidic fens**	**Yes**	**Possible occurrence**
Colorado tansyaster	***Machaeranthera coloradoensis***	**K**	**Open, gravelly areas**	**Yes**	**Possible occurrence**
Kotzebue's grass of Parnassus	***Parnassia kotzebuei***	**K**	**Wet, rocky ledges**	**Yes**	**Possible occurrence**
Harrington's beardtongue	*Penstemon harringtonii*	K	Open sagebrush on calcareous soil	No	Generally too high in elevation and no calcareous soils
Ice cold buttercup	*Ranunculus karelinii*	K	Alpine	No	No alpine habitat
Dwarf raspberry	***Rubus arcticus ssp. acaulis***	**L**	**Wetlands**	**Yes**	**Possible occurrence**
Sageleaf willow	***Salix candida***	**L**	**Wetlands, mainly fens**	**Yes**	**Possible occurrence**
Autumn willow	***Salix serissima***	**L**	**Wetlands, mainly fens**	**Yes**	**Possible occurrence**
Cathedral Bluff meadow-rue	*Thalictrum heliophilum*	K	Dry, shale slopes	No	Too high in elevation; no hot, dry, open sites
Lesser bladderwort	***Utricularia minor***	**L**	**Wetlands, mainly fens**	**Yes**	**Possible occurrence**
American cranberrybush	*Viburnum opulus var. americanum*	L	Wetlands and moist areas	No	Elevation too high

[1]Plant nomenclature from USFS (2018)
[2]Source: USFS (2018)
[3]Sources: Ackerfield (2015), Beatty, et al. (2003, 2004), Ladyman (2006a, 2006b), Neid (2006), Nellessen (2006), Panjabi and Anderson (2006, 2007), Spackman, et al. (1997), Weber and Wittmann (2001a, 2001b)

Analysis of Effects and Determinations

The Study Area does not contain suitable habitat for 14 of the 34 TEPS plant species that are listed by the USFS as potentially occurring in the WRNF (**Table 14**). Thus, the determination of effect for those species is **no effect.** The rationale for this determination is based on fieldwork to identify potential habitat, existing literature on habitat preferences (Ackerfield 2015; Beatty, et al. 2003, 2004; Ladyman 2006a, 2006b; Neid 2006; Nellessen 2006; Panjabi and Anderson 2006, 2007; Spackman, et al. 1997; Weber and Wittmann 2001a, 2001b), and discussions with USFS personnel. Potential impacts to the other 20 species potentially occurring are discussed below by alternative.

No Action Alternative

The No Action Alternative would leave West Vail Pass as it currently is configured and would not provide substantial improvements beyond typical current maintenance (e.g. resurfacing and plowing) activities. Thus, the effect determination for the No Action Alternative on the 20 TEPS that may occur in or near the study Area is **no effect**.

Proposed Action Alternative

Given the presence of suitable habitat for 20 of the 34 species potentially occurring within and/or very near the proposed impact areas, the effect determination for all 20 is **may adversely impact individuals, but not likely to result in a loss of viability in the Planning Area, nor cause a trend toward federal listing.** Presence/absences surveys following USFS survey protocols are needed for all these species to accurately determine impacts.

If any of these plants are present within the planned work areas, direct impacts could include permanent loss of individual plants and their habitats; trampling of individuals; and/or breaking, crushing, or uprooting plants by driving machinery or skidding material over them. Impacted plants could experience reduced growth and development as well as reduced, or eliminated, seed-set and reproduction. Such impacts may result in mortality of individuals or whole populations. The timing of these impacts may also be critical for these plant species. Impacts occurring in spring, prior to the release of spores or seeds, could result in reduced population size, changed meta-population structure, and potentially affect species viability in the Study Area or range-wide.

Indirect effects to these species (if present) could be caused by increasing dust, which could cause changes in vegetation composition and cover; vectoring and creating habitat for competitive invasive plant species; changing local hydrologic patterns in plant habitat; changing soil characteristics of the habitat; changing the distribution of recreation or other activities in the area; and/or impacting associated pollinators or mycorrhizae. Such habitat modifications may cause shifts in hydrologic, solar, and soil characteristics of plant habitats. These indirect impacts can have positive or negative effects on the plants and are often species-specific, being positive for some species and negative for others.

Responsibility For A Revised Biological Evaluation

This BE was prepared based on presently available information. If the action is modified in a manner that causes effects not considered, or if new information becomes available that reveals that the action may impact endangered, threatened, proposed, or sensitive species in a manner or to an extent not previously considered, a new or revised BE will be required.

Proposed Mitigation Measures

To minimize potential resource impacts from construction and implementation of any approved project components, Project Design Features (PDF) have been incorporated into The Proposed Action. PDFs are devised in the pre-analysis and analysis phases to reduce environmental impacts that must be complied with by law and/or regulation. They include, but are not limited to, Best Management Practices, standards and guidelines, and standard operating procedures. PDFs come from federal, state, and local laws, regulations and policies, forest plans, scientific research, and from experience in designing similar projects. The bulk of the PDF are considered common practices CDOT

has historically used in sub-alpine and montane environments to avoid or minimize potential resource impacts. They are highly effective methods that can be planned in advance and adapted to site conditions, as needed. PDFs recommended here also include measure recommended in the ALIVE MOU, I-70 Mountain Corridor PEIS (CDOT 2011), Regional Ecosystem Framework (Kintsch et al. 2011), and other relevant studies and reports.

Table 15 displays specific measures to mitigate the effects of project design elements that may exacerbate the barrier effect of I-70. **Table 16** describes PDFs by LIZ intended to facilitate wildlife movement through the Study Area and reduce WVCs. **Table 17** displays mitigation measures in Tier 2 NEPA processes based on the mitigation strategies described in the I-70 Mountain Corridor Record of Decision and Final PEIS (CDOT 2011).

The selection of wildlife underpasses can be categorized into two distinctly different but general sizes; Large Mammal Underpass and Small to Medium Mammal Underpass. The general layout of two larger underpasses and several smaller underpasses follows the intent of the original ALIVE recommendations, with the exception of the exclusion of an overpass. These classifications of sizes are as noted and described in Table 4 of the FHWA "Wildlife Crossing Structure Handbook Design and Evaluation in North America" ("Crossing Structure Handbook", FHWA 2011) follows:

- Large Mammal Underpass (MPs 187.4 and 188.3): The target species for this category of wildlife passage are black bear, Canada lynx, elk, moose, mountain lion, and mule deer. The minimum dimensions of this classification of structure are noted as 23' wide x 13' tall for an arch opening and 20' wide x 10' tall for a box structure. The proposed size of the underpass will be further defined in final design but will be equal to, or greater, in size to the minimums mentioned. These crossings were preliminarily found to be topographically possible in only two locations within the study area and their general lengths are around 150', shorter than the recommended maximum of 230'-260'. It should be noted, however, that the same author of the 2011 FHWA Guide, Clevenger, studied 4 underpasses with dimensions of about 24' wide by 12' tall and lengths of 205', 167', 188' and 185' passing under a 4 lane highway with a median. These underpasses were consistently found to be 76% effective for the passage of deer (Clevenger 2014). The underpasses in the study area will be located where all six lanes are together with no median, thus minimizing the length of the crossing structures. The 150' potential length is inclusive of an area for catching snow, so that under most scenarios only seasonal snow will accumulate at the entrances to the underpasses and snow thrown from the highway by plows will be minimized. Although the Crossing Structure Handbook indicates that additional research is needed regarding lynx use of this type of underpass, in the 5+ year study of highway crossing structures in Banff by Clevenger (2014), a lynx was recorded using a box culvert that was 10' wide x 8' tall x 190' in length as well as an arch culvert 24' wide x 11' tall and 205' in length, compared to only 5 lynx using two overpasses in their study area during the same period. Although lynx crossings are not well documented and little other information is available for reference, there are documented accounts by Clevenger and others (Clevenger et al. 2003; Grilo et al. 2009, Baigas et al. 2017). The four underpasses in the 2014 Clevenger study were used repeatedly by bears, wolves, coyotes, moose, deer and elk.
- Small to Medium Mammal Underpass (MPs 186.9, 187.8, 188.7, 189.7): Target species include American marten, bobcat, coyote, red-tailed fox, yellow-bellied marmot, small mammals, short-tailed weasel, and snowshoe hare. The Crossing Structure Handbook

recommends small to medium underpasses that are 1' to 4' (diameter for culverts or square for concrete boxes). In order to increase the likelihood of use by a large range of small to medium animals and account for snow accumulation, however, the minimum size for the locations under consideration should be 6' diameter culvert or similar sized concrete box. This is the recommended passage for coyote, fox, fisher, marten, weasels and badgers (FHWA 2011). Ruediger (2007) has noted smaller diameter culverts also work for bobcats and notes that a 4' diameter culvert is the minimum for bobcats. If the 6' size is used, a smaller 6 inch diameter pipe can be placed inside to allow safe passage of small(er) mammals while still not limiting the movement of larger predators.

In addition, the following measures will be implemented to further improve habitat connectivity and reduce WVCs through the Study Area:

- Fulfill responsibilities set forth in the ALIVE MOU to address issues related to improving wildlife movement and reducing habitat fragmentation in the Study Area.
- Wildlife fencing to be installed from west of the bridge at MP 181.0 east through the entire Study Area to prevent WVCs and guide animals to all of the crossing structures. Where ramps are not feasible due to topographical and/or other limitations other measures such as wildlife gates will be installed at a similar spacing.
- Small mammal shelves will be installed within drainage and stream crossing culverts wherever feasible to increase below grade crossing opportunities for smaller animals.
- Maintain or install woody vegetation at either side of crossings for cover and light attenuation.
- Add features to bridges to promote day and night roosting for bats where appropriate.
- Wildlife escape ramps will be installed throughout the project area at a minimum of every 0.25 miles. Ramps will be built following the most current design specifications to improve wildlife use.
- Measures to minimize snow loading in front of crossing structures will be included in crossing structure design.
- Coarse woody material and rocks will be placed at the entry and within each crossing structure to provide cover and promote use by smaller animals.
- Where site conditions allow, "wildlife lanes" will be incorporated within any crossing structure intended for or that may otherwise be used by people (**Figure 19**). Such lanes will be separated by grade from crossing intended for people (i.e., trail) and will include coarse woody material and rocks at entry and within crossing structure to provide cover and promote use by smaller animals.

Highway lighting standards are based on the Illuminating Engineering Society of North America's (IES) standards, and newer designs are available that meet the IES standards but have reduced light pollution effects. Lower wattage flat lens fixtures on highways and city streets direct light down and reduce glare, thus reducing light pollution.

Figure 19. Wildlife Lane Incorporated into an Existing Underpass Originally for Vehicle Use Only. Logs and Boulders Were Added to Promote Wildlife Use. Source: Ruediger and Jacobson 2013.

The following general mitigation measures will be implemented during construction to reduce impacts on wildlife:

- To ensure compliance with the Migratory Bird Treaty Act, CDOT Specification 240 will be followed by the contractor. Specification 240 outlines requirements regarding nests on structures, seasonal vegetation-clearance restrictions, and measures to buffer bird nests within a construction area.
- Provide temporary fencing in riparian areas to protect wildlife from construction activities.
- Replace riparian trees and shrubs removed as stipulated in CDOT's Guidelines for Senate Bill 40 Wildlife Certification, which states that riparian trees removed during construction, whether native or non-native, shall be replaced with a goal of 1:1 replacement based on a preconstruction stem count of all trees with a diameter at breast height of two inches or greater.
- Riparian shrubs removed during construction, whether native or non-native, will be replaced with native species based on their preconstruction areal coverage. In all cases, CDOT will replace all such trees and shrubs with native species.
- A vegetation survey will be completed during final design to determine the number of riparian trees and the areal coverage of shrubs impacted.
- Avoid disturbance of native trees, shrubs, and vegetation to the extent possible. When disturbance is unavoidable, replace native and non-native species with native species.
- Use bear-resistant trash receptacles near construction areas.
- Use CDOT-approved best management practices to offset the extent and duration of any temporary impacts to aquatic habitat.
- In no instance allow construction activities or equipment to work in flowing water or disturb sediment during recognized trout spawning seasons unless in coordination with Colorado Parks and Wildlife, as follows:
  - Cutthroat & Rainbow Trout: March 1-May 31
  - Brown Trout: October 1-November 30

- Prevent the spread of invasive aquatic nuisance species, including Eurasian watermilfoil, zebra mussel, and New Zealand mudsnail by following CDOT's Guidelines for Senate Bill 40 Wildlife Certification.
- Prevent the spread of noxious weeds by ensuring that all equipment is free of noxious weed seed and reproductive vegetative plant parts prior to use of that equipment in aquatic ecosystems and riparian areas, including wetlands in accordance with CDOT's Guidelines for Senate Bill 40 Wildlife Certification.
- Bat surveys should be conducted on all bridges planned for demolition or significant modification. If bats are found, demolition or construction should be suspended during that species maternity season, approximately May 15 – July 15.

Recommended Plant Conservation Measures

The following conservation measures will be implemented to minimize impacts to 20 TEPS plant species that have potential habitat in the Study Area:

- Conduct presence/absence surveys using USFS survey protocol in the following areas that would be impacted under the Proposed Action:
  - Fens, natural slope wetlands, and riverine wetlands (not wetlands with stormwater as their primary water source) for both sphagnum species, both sedges, all three cottongrasses, simple bog sedge, Porter feathergrass, roundleaf sundew, Kotzebue's grass of Parnassus, dwarf raspberry, both willows, and lesser bladderwort
  - Moist meadows and open natural wetland edges for park milkvetch
  - Aspen forest areas for yellow lady slipper
  - Open slopes, forest edges and historically disturbed areas for triangle lobe moonwort and narrowleaf grapefern
  - Open, gravelly slopes for Colorado tansyaster

Table 15. Barrier Effect Mitigation Measures

CONTEXT			
The lower portion of the pass (MP 181.7 through MP 185.5) has a series of bridge structures over drainages and rivers (Figure 6). This area allows for wildlife movement across the highway without the need for animals to traverse over the roadway. The upper portion of the Study Area (MP 185.5 through MP 190) does not have any structures that allow for unimpeded wildlife movement. Additionally, there are multiple barriers along the roadway that wildlife must negotiate (e.g., guardrails, median barriers, and grade separation of the east and west bound lanes of I-70).			
IMPACT TYPE	**NO ACTION ALTERNATIVE**	**PROPOSED ACTION ALTERNATIVE**	**MITIGATION**
Increased wildlife barrier effect	**Permanent Impacts**: None- no new impacts would occur **Temporary Impacts:** None- no new impacts would occur	**Permanent Impacts**: Potential to create new barriers to wildlife movement and create habitat fragmentation from highway widening, glare screens, new retaining walls, and drainage improvements. **Temporary Impacts:** Some temporary impacts for access or construction activities may occur	• Six new wildlife crossing structures (underpasses) constructed between MP 185.0 and 190.0. Wildlife fencing to be installed on both sides of the highway throughout the Study Area to prevent WVCs and guide animals to crossing structures. • Where possible, avalanche mitigation structures will be placed such that they do not impede wildlife movement or use of crossing structures and outside of primary and secondary vegetation. If the avalanche mitigation is inside the wildlife exclusion fence, there will be no impact and mitigation is unnecessary. • Wildlife fencing will be installed on both sides of the highway throughout the Study Area to keep animals off the road surface, prevent WVCs, and guide animals to crossing structures. • Where possible, retaining walls will be placed such that they do not impede wildlife movement or use of crossing structures and outside of primary and secondary vegetation. • Construction should be conducted as to not permanently impede movement of the species and prevent it from accessing habitats necessary for breeding, feeding, sheltering, and dispersal. This determination shall be made by a CDOT approved biologist.

Habitat and vegetation impacts during construction	**Permanent Impacts**: None- no new impacts would occur **Temporary Impacts:** None- no new impacts would occur	**Permanent Impacts**: None **Temporary Impacts:** Temporary ground disturbance and vegetation impacts may occur during construction.	Construction should be concentrated to as small of an area as possible in order to minimize the amount of habitat affected at one time and keep adjacent habitat areas available for use by the species to forage, hide, or travel. Re-contour and restore all temporarily impacted habitats on the project site so that they become available for use.
Light pollution from I-70	**Permanent Impacts**: None- no new impacts would occur **Temporary Impacts:** None- no new impacts would occur	**Permanent Impacts**: Impacts to foraging and travel behaviors **Temporary Impacts**: Impacts to foraging and travel behaviors	Temporary lighting will be used with directional shielding to focus the lighting onto the driving surface to avoid disrupting foraging and travel behaviors of this primarily nocturnal species. For the same reasons, ensure that permanent lighting is "dark sky" compliant and shines only on the area(s) that need to be illuminated. Do not install lighting in areas of lynx or snowshoe hare habitat to prevent disturbing these species' foraging behaviors. Ensure that lights are on only when necessary (i.e., at chain stations ensure that lights are on only when chain-up or chain-down is necessary). Monitor lighting to ensure that it does not exceed the approved lighted area and that lights are on only when necessary to reduce the effects of the project on Canada lynx populations.
Light pollution during construction	**Permanent Impacts**: None- no new impacts would occur **Temporary Impacts:** None- no new impacts would occur	**Permanent Impacts**: None **Temporary Impacts**: Impacts to foraging and travel behaviors during construction	Conduct work during daylight hours when lynx are less active to avoid disrupting this nocturnal species foraging and travel behaviors. If night work must be conducted, concentrate the activity in as small an area as possible, and work for four (4) consecutive nights separated by three consecutive nights of no work to allow any individuals in the vicinity to recover and potentially use the site for foraging or travel.

Table 16. Barrier Effect Mitigation Measures for Linkage Interference Zones

Linkage Interference Zone	Mile Post	No Action Alternative Impact	Proposed Action Alternative Impact	Mitigation
Gore Creek	180.8	Bridge spans natural habitat and offers an excellent passage beneath the interstate for all types of wildlife.	Bridge to be replaced with similar structure.	During final design CDOT will coordinate with the neighborhood to develop acceptable measures that would allow wildlife to access habitat on the south side of the neighborhood, completing the north-south connection on either side of I-70. If wildlife passage through or around neighborhood can be accommodated then install guide fencing to direct wildlife towards the structure.
Gore Creek	181.9	Large divided span bridge spans natural habitat and offers an excellent passage beneath the interstate for all types of wildlife.	Bridge to be replaced with similar structure.	Implement measures to minimize human activity beneath 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.
-	182.4	Divided bridge over steep, narrow channel.	Bridge to be replaced with similar structure.	Maintain connectivity at site including natural stream channel and stream banks.

West Vail Pass	183.0	3.3 foot diameter culvert piped under bridge structure. Culvert is heavily skewed relative to road. Outlet drops onto metal apron. Metal wing wall at outlet broken and leaning across outlet. Inlet inaccessible, surrounded by willows. Crossing integrity is affected by heavy backcountry skier use.	If necessary, culvert to be replaced with similar structure.	Complement structure with guide fencing to direct animals toward structure and discourage at-grade crossings.
West Vail Pass	184.0	Large divided span bridge over Timber Creek. Spans natural habitat and offers an excellent passage beneath the interstate for all types of wildlife.	Bridge to be replaced with similar structure.	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.
West Vail Pass	184.4	Large divided span bridge over Black Gore Creek. Spans natural habitat and offers an excellent passage beneath the interstate for all types of wildlife.	Bridge to be replaced with similar structure.	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.
West Vail Pass	184.9	Large divided span bridge over Miller Creek. Spans natural habitat and offers an excellent passage beneath the interstate for all types of wildlife. Natural upstream barrier maintained to protect conservation cutthroat trout population.	Bridge to be replaced with similar structure.	Maintain connectivity at site including natural stream channel and stream banks. The existing fish barrier will remain in place and will be improved and/or repaired if necessary.
West Vail Pass	185.4	Large divided span bridge over Polk Creek – Black Gore Creek confluence. Spans natural habitat and offers an excellent passage beneath the interstate for all types of wildlife. Upstream barrier maintained CPW to protect conservation cutthroat trout population.	Bridge to be replaced with similar structure.	Maintain connectivity at site including natural stream channel and stream banks. The existing fish barrier will remain in place and will be improved and/or repaired if necessary.

West Vail Pass	186.9[1]	No crossing structure. Small to medium-sized mammals must cross road surface.	Additional lanes and safety features will pose a substantial barrier to small to medium-sized mammal movement, potentially increase WVCs, and decrease habitat connectivity.	Construct Small to Medium Mammal Underpass Target species include American marten, bobcat, coyote, red-tailed fox, yellow-bellied marmot, small mammals, short-tailed weasel, and snowshoe hare.
West Vail Pass	187.4[1]	No crossing structure. Large mammals must cross road surface.	Additional lanes and safety features will pose a substantial barrier to large mammal movement, potentially increase WVCs, and decrease habitat connectivity.	Construct Large Mammal Underpass. Target species include black bear, Canada lynx, elk, moose, mountain lion, and mule deer.
West Vail Pass	187.8[1]	No crossing structure. Small to medium-sized mammals must cross road surface.	Additional lanes and safety features will pose a substantial barrier to small to medium-sized mammal movement, potentially increase WVCs, and decrease habitat connectivity.	Construct Small to Medium Mammal Underpass Target species include American marten, bobcat, coyote, red-tailed fox, yellow-bellied marmot, small mammals, short-tailed weasel, and snowshoe hare.
West Vail Pass	188.3[1]	No crossing structure. Large mammals must cross road surface.	Additional lanes and safety features will pose a substantial barrier to large mammals movement, potentially increase WVCs, and decrease habitat connectivity.	Construct Large Mammal underpass. Target species include black bear, Canada lynx, elk, moose, mountain lion, and mule deer.

West Vail Pass	188.7[1]	No crossing structure. Small to medium-sized mammals must cross road surface.	Additional lanes and safety features will pose a substantial barrier to small to medium-sized mammal movement, potentially increase WVCs, and decrease habitat connectivity.	Construct Small to Medium Mammal underpass. Target species include American marten, bobcat, coyote, red-tailed fox, yellow-bellied marmot, small mammals, short-tailed weasel, and snowshoe hare.
West Vail Pass	189.7[1]	No crossing structure. Small to medium-sized mammals must cross road surface.	Additional lanes and safety features will pose a substantial barrier to small to medium-sized mammal movement, potentially increase WVCs, and decrease habitat connectivity.	Construct Small to Medium Mammal underpass. This location was selected as a collar study Squires et al. (2011) noted a Canada lynx crossing in this location. This location is topographically challenged for a Large Mammal Underpass but a smaller size crossing may fit in this area, perhaps as large as 6' to 8' in diameter. The passage may need to be open at the median. As stated previously, there is little information captured about lynx using any type of passages over or under the highway so this installation may be somewhat experimental. Martinig and Mclaren (2019), however, found that crossing structures that include natural habitat in their design, such as by maintaining safe access to a vegetated median within the highway corridor may increase wildlife use and successful crossings.
[1]Approximate location				

Table 17. Pertinent Mitigation Measures in Tier 2 NEPA Processes Based on the Mitigation Strategies Described in the I-70 Mountain Corridor Record of Decision and Final Programmatic Environmental Impact Statement

POTENTIAL IMPACTS	MITIGATION STRATEGIES
• Vegetation and habitat loss due to construction • Disturbance of nesting birds • Downstream impacts to aquatic species	CDOT will identify areas of potential habitat restoration, in coordination with the USFS and local entities. Construction work affecting migratory birds will comply with the requirements of the Migratory Bird Treaty Act and will be performed according to CDOT specifications to avoid impacts to migratory birds before and during construction. Additionally, the project will comply with the Upper Colorado River Endangered Fish Recovery Program for any water depletions resulting from construction activities.
Introduction and/or spread of noxious weeds into lands adjacent to the I-70 Mountain Corridor	CDOT will manage the clearing and earthmoving operations to minimize the potential for weeds to infest new areas and/or increase in abundance through the construction disturbance area. This includes the application of BMPs to all construction sites to manage open soil surfaces and topsoil stockpiled for reuse, including landscape and planning designs that incorporate the use of native vegetation and integrated noxious weed controls. CDOT will prepare and implement Noxious Weed Management Plans for the project, which will be completed prior to construction so they reflect the most recent federal and local noxious weed lists and guidance. Noxious Weed Management Plans will identify the status and location of noxious weed infestations in and near individual project areas and identify control methods (e.g., herbicides) and BMPs that will be used to eradicate or control weeds during and after construction. These BMPs generally include, but are not limited to, minimization of soil disturbance, use of native species in seeding and revegetation plans, use of weed-free hay, topsoil management, equipment cleaning and management, and coordination with relevant stakeholders such as County Weed Managers.

REFERENCES

Ackerfield, J. 2015. Flora of Colorado. Colorado State University Herbarium.

Adams, R. A. 2003. Bats of the Rocky Mountain West: natural history, ecology, and conservation. University Press of Colorado, Boulder.

Altman, B. 1997. Olive-sided Flycatcher in western North America: Status review. Prepared for U.S. Fish and Wildlife Service, Oregon State Office, Portland, OR. 59 pp.

Altman, B., R. Sallabanks, A. Poole, and F. Gill. 2000. Olive-sided Flycatcher (*Contopus cooperi*). The Birds of North America Online.

Andrews, R., and R. Righter. 1992. Colorado birds: a reference to their distribution and habitat. 1st edition. Denver Museum of Natural History, Denver, Colo.

Arellano-Guillermo, A., J. Glendinning, J. B. Anderson, and L. Brower. 1993. Interspecific comparisons of the foraging dynamics of black-backed orioles and black-headed grosbeaks on overwintering monarch butterflies in Mexico.315-322.

Armstrong, D. M., R. A. Adams, J. Freeman, and University of Colorado (System). Museum. 1994. Distribution and ecology of bats of Colorado. University of Colorado Museum, Boulder, Colo.

Armstrong, D. M., J. P. Fitzgerald, and C. A. Meaney. 2011. Mammals of Colorado. 2nd edition. Denver Museum of Nature & Science/University Press of Colorado, Boulder, Colo.

Bailey, R. G. 1976. Ecoregions of the United States. USDA USFS, Washington, D.C.

Bailey, R. G. 1995. Description of the ecoregions of the United States. 2nd edition. U.S. Dept. of Agriculture, USFS, Washington, DC.

Bailey, R. G., United States Geological Survey, and United States USFS. 1998. Ecoregions of North America. U.S. Dept. of Agriculture, USFS, Washington, D.C.

Beatty, B.L., W.F. Jennings, and R.C. Rawlinson. 2003. *Botrychium ascendens* W.H. Wagner (trianglelobe moonwort), B. crenulatum W.H. Wagner (scalloped moonwort), and *B. lineare* W.H. Wagner (narrowleaf grapefern): A Technical Conservation Assessment. [Online]. USDA USFS, Rocky Mountain Region.: http://www.fs.fed.us/r2/projects/scp/assessments/botrychiums.pdf.

Beatty, B.L., W.F. Jennings, and R.C. Rawlinson. 2004. *Machaeranthera coloradoensis* (Gray) Osterhout (Colorado tansyaster): A Technical Conservation Assessment. [Online]. USDA USFS, Rocky Mountain Region. http://www.fs.fed.us/r2/projects/scp/assessments/machaerantheracoloradoensis.pdf.

Beauvais, G. P., and J. McCumber. 2006. Pygmy Shrew (*Sorex hoyi*): a technical conservation assessment. [Online]. USDA USFS, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/pygmyshrew.pdf.

Bestgen, K., K. Rogers, and R. Granger. 2013. Phenotype predicts genotype for lineages of native cutthroat trout in the Southern Rocky Mountains. Final Report to U. S. Fish and Wildlife Service, Colorado Field Office. Larval Fish Laboratory Contribution 177,, Denver Federal Center (MS 65412), Denver, CO.

Bestgen, K., K. Rogers, and R. Granger. 2019. Distinct Phenotypes of Native Cutthroat Trout Emerge under a Molecular Model of Lineage Distributions. Transactions of the American Fisheries Society **148**:442–463.

Bissonette, J. A., D. J. Harrison, C. D. Hargis, and T. G. Chapin. 1997. The Influence of Spatial Scale and Scale-Sensitive Properties on Habitat Selection by American Marten *in* J. A. Bissonette, editor. Wildlife and Landscape Ecology. Springer, New York, NY.

Bock, C. E., and J. Bock. 1974. On the Geographical Ecology and Evolution of the Three-toed Woodpeckers, *Picoides tridactylus* and *P. arcticus*.

Braun, C. 1993. White-tailed Ptarmigan. The Birds of North America Online.

Braun, C., R. W. Hoffman, and G. E. Rogers. 1976. Wintering areas and winter ecology of white-tailed ptarmigan in Colorado. Special Report 38. Colorado Division of Wildlife, Fort Collins, CO.

Buskirk, S. W., and R. Powell. 1999. Habitat ecology of fishers and American martens. Pages 283-296 *in* S. Buskirk, A. Harestad, M. Raphael, and R. Powell, editors. Martens, sables, and fishers: biology and conservation. Comstock Publishing Associates, Cornell University Press, Ithaca, NY.

Buskirk, S. W., and L. F. Ruggiero. 1994. American Marten. Pages 7-37 in K. B. Aubry, L. F. Ruggiero, S. W. Buskirk, L. J. Lyon, and W. J. Zielinski, editor. American marten, fisher, lynx, and wolverine, in the Western United States. United States Department of Agriculture, USFS, General Technical Report RM-254, USA.

CDOT. 2011. I-70 Mountain Corridor Final Programmatic Environmental Impact Statement (PEIS). Colorado Department of Transportation, Denver, CO.

CNHP. 2019. Statewide List of Tracked Species and Communities. Online database available at http://www.cnhp.colostate.edu/download/list.asp., Colorado Natural Heritage Program, Colorado State University, Fort Collins, CO.

Colorado Parks & Wildlife. 2019. CPW All Species Activity Mapping Data. Available online at http://www.arcgis.com/home/group.html?owner=rsacco&title=Colorado%20Parks%20and%20Wildlife%20-%20Species%20Activity%20Data. Colorado Parks & Wildlife, Fort Collins, CO.

Corn, J. G., and M. G. Raphael. 1992. Habitat Characteristics at Marten Subnivean Access Sites. The Journal of Wildlife Management 56:442-448.

Crockett, A. B., and P. L. Hansley. 1978. Apparent response of *Picoides* woodpeckers to outbreaks of the pine bark beetle. Western Birds 9:67-70.

DeMott, S. L., and G. P. Lindsey. 1975. Pygmy shrew, *Microsorex hoyi*, in Gunnison County, Colorado. Southwestern Naturalist 20:417-418.

Dobkin, D. S. 1994. Conservation and management of neotropical migrant landbirds in the Northern Rockies and Great Plains. University of Idaho Press, Moscow, Idaho.

Evans, E., R. Thor, S. Jepson, and S. H. Black. 2008. Status review of three formerly common species of bumblebee in the subgenus Bombus. Prepared for the Xerces Society for Invertebrate Conservation. [Online] http://www.xerces.org/wpcontent/uploads/2008/12/xerces_2008_bombus_status_review.pdf.

Felsburg Holt & Ullevig. 2009. I-70 West Vail Pass Habitat Linkage Structure Location, Design Criteria, and Conceptual Design Report. Prepared for the Colorado Department of Transportation, Region 3. Centennial, CO.

Finch, D. M., P. W. Stangel, Rocky Mountain Forest and Range Experiment Station (Fort Collins Colo.), and U.S. Fish and Wildlife Service. 1993. Status and management of neotropical migratory birds : September 21-25, 1992, Estes Park Center, YMCA of the Rockies, Colorado. Rocky Mountain Forest and Range Experiment Station, U.S. Dept. of Agriculture, Fort Collins, Colo.

Fitzgerald, J. P., C. A. Meaney, and D. M. Armstrong. 1994. Mammals of Colorado. Denver Museum of Natural History; University Press of Colorado, Niwot, Colo.

Forman, R. T. T., and L. E. Alexander. 1998. Roads and their Major Ecological Effects. Annual Review of Ecology and Systematics 29:207-231.

Forman, R. T. T., and R. D. Deblinger. 2000. The Ecological Road-Effect Zone of a Massachusetts (U.S.A.) Suburban Highway. Conservation Biology 14:36-46.

Glendinning, J. I. 1993. Comparative feeding responses of the mice *Peromyscus melanotis*, *P. aztecus*, *Reithrodontomys sumichrasti*, and *Microtus mexicanus* to overwintering Monarch butterflies in MexicoAngeles, California. Science series no. 38. Pages 323-333 in S. B. Malcom and M. P. Zalucki, editors. Biology and conservation of the Monarch butterfly. Publications of the Natural History Museum of Los Angeles County, Los Angeles, CA.

Hammerson, G. A. 1999. Amphibians and reptiles in Colorado. 2nd edition. University Press of Colorado; Colorado Division of Wildlife, Niwot, Colo.

Hayward, G. D., and P. H. Hayward. 1993. Boreal Owl (*Aegolius funereus*).in A. Poole and F. Gill, editors. The Birds of North America, No. 63 The Academy of Natural Sciences and The American Ornithologists' Union, Philadelphia, PA.

J.F. Sato and Associates. 2007. A Landscape Level of Integrated Valued Ecosystems Program and its Contribution to the I-70 Mountain Corridor Programmatic Environmental Impact Statement. Prepared for CDOT Region 1 and Southern Rockies Ecosystem Project. Littleton, Colorado.

Joy, S. M., R. T. Reynolds, and D. G. Leslie. 1994. Northern Goshawk Broadcast Surveys: Hawk Response Variables and Survey Costs *in* W. M. Block, M. L. Morrison, and M. H. Resier, editors. The Northern Goshawk: Ecology and Management, Studies in Avian Biology No. 16:24.

Jr., R. K. T. 1984. Wildlife habitat requirements. Pages 72-209 *in* R. L. Hoover and D. L. Wills, editors. Managing forested lands for wildlife. Colorado Division of Wildlife, Denver, CO.

Keinath, D., and J. Bennett. 2000. Distribution and status of the boreal toad (*Bufo boreas boreas*) in Wyoming. Prepared for USFWS, Wyoming Field Office. Internet source: http://uwadmnweb.uwyo.edu/wyndd/PDF_files/pdf_keinath/Boreal%20Toad%20Status.pdf.

Keinath, D. A. 2004. Fringed Myotis (*Myotis thysanodes*): a technical conservation assessment. [Online]. USDA USFS, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/fringedmyotis.pdf, Fort Collins, CO.

Kennedy, P. L. 2003. Northern Goshawk (*Accipiter gentiles atricapillus*): a technical conservation assessment. USDA USFS, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/northerngoshawk.pdf.

Kingery, H. E. 1998. Colorado breeding bird atlas. Colorado Bird Atlas Partnership : Colorado Division of Wildlife, Denver, Colo.

Kintsch, J., P. Singer, M. Huijser, J. Crane, and A. Huyett. 2011. A regional ecosystem framework for terrestrial and aquatic wildlife along the 1-70 Mountain Corridor in Colorado: An Eco-Logical field test. Report to the Federal Highway Administration and the Colorado Department of Transportation. CDOT, Denver, CO.

Koplin, J. R. 1969. The Numerical Response of Woodpeckers to Insect Prey in a Subalpine Forest in Colorado. The Condor 71:436-438.

Ladyman, J.A.R. 2006a. *Astragalus leptaleus* (Gray) (park milkvetch): A Technical Conservation Assessment. [Online]. USDA USFS, Rocky Mountain Region. http://www.fs.fed.us/r2/projects/scp/assessments/astragalusleptaleus.pdf.

Ladyman, J.A.R. 2006b. *Rubus arcticus* L. ssp. *acaulis* (Michaux) Focke (dwarf raspberry): A Technical Conservation Assessment. [Online]. USDA USFS, Rocky Mountain Region. http://www.fs.fed.us/r2/projects/scp/assessments/rubusarcticussspacaulis.pdf.

Livo, L. J., and D. Yeakley. 1997. Comparison of current with historical elevational range in the Boreal Toad. Herpetological Review 28:143-144.

Loeffler, C., editor. 2001. Conservation plan and agreement for the management and recovery of the southern Rocky Mountain population of the boreal toad (*Bufo boreas boreas*). Boreal Toad Recovery Team.

Marr, J. W. 1961. Ecosystems of the east slope of the front range in Colorado. University of Colorado Press, Boulder, Colorado.

Merrell, D. J., and C. F. Rodell. 1968. Seasonal selection in the leopard frog, *Rana pipiens*. Evolution 22:284-288.

Messmer, T. A., C. W. Hendricks, and P. W. Klimack. 2000. Modifying human behavior to reduce wildlife vehicle collisions using temporary signing in wildlife and highways: seeking solutions to an ecological and socio-economic dilemma. Pages 125–139 in T. A. Messmer and B. West, editors. Seventh Annual Meeting of the Wildlife Society. The Wildlife Society, Nashville, Tennessee.

Metcalf, J. L., S. Love Stowell, C. M. Kennedy, K. B. Rogers, D. McDonald, J. Epp, K. Keepers, A. Cooper, J. J. Austin, and A. P. Martin. 2012. Historical stocking data and 19th century DNA reveal human-induced changes to native diversity and distribution of cutthroat trout. Molecular Ecology 21:5194-5207.

Natural Resources Conservation Service (NRCS). 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. United States Department of Agriculture Handbook 296.

Natural Resources Conservation Service (NRCS). 2014. PLANTS Database: http://www.plants.usda.gov. Accessed in January.

NatureServe. 2019. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe Web Service, Arlington, Virginia. Available online at http://www.natureserve.org/explorer.

Neid, S.L. 2006. Utricularia minor L. (lesser bladderwort): A Technical Conservation Assessment. [Online]. USDA USFS, Rocky Mountain Region. http://www.fs.fed.us/r2/projects/scp/assessments/utriculariaminor.pdf.

Nelson, R. A. 1977. Handbook of Rocky Mountain plants. Skyland Publishers, Estes Park, Colorado.

Nellessen, J.E. 2006. *Viburnum opulus* L. var. *americanum* (Mill.) Ait. (American cranberrybush): A Technical Conservation Assessment. [Online]. USDA USFS, Rocky Mountain Region. http://www.fs.fed.us/r2/projects/scp/assessments/viburnumopulusvaramericanum.pdf.

Panjabi, S.S. and D.G. Anderson. 2006. *Ranunculus karelinii* Czern. (Ice cold buttercup): A Technical Conservation Assessment. [Online]. USDA USFS, Rocky Mountain Region. http://www.fs.fed.us/r2/projects/scp/assessments/ranunculuskarelinii.pdf.

Panjabi, S.S. and D.G. Anderson. (2007, January 4). *Thalictrum heliophilum* Wilken & DeMott (Cathedral Bluff meadow-rue): A Technical Conservation Assessment. [Online]. USDA USFS, Rocky Mountain Region. http://www.fs.fed.us/r2/projects/scp/assessments/thalictrumheliophilum.pdf.

Pettus, D., and R. R. Lechleitner. 1963. Microsorex in Colorado. Journal of Mammalogy 44:119.

Reimer, J. P., E. F. Baerwald, and R. M. R. Barclay. 2010. Diet of Hoary (*Lasiurus cinereus*) and Silver-haired (*Lasionycteris noctivagans*) Bats While Migrating Through Southwestern Alberta in Late Summer and Autumn. American Midland Naturalist 164:230–237.

Reynolds, R. T., M. Graham, H. Rieser, R.L.Bassett, P. L. Kennedy, J. D.A. Boyce, G. Goodwin, R. Smith, and E. L. Fisher. 1992. Management recommendations for the northern goshawk in the southwestern United States. USDA USFS, Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colo.

Romin, L. A., and J. A. Bissonette. 1996. Deer: Vehicle Collisions: Status of State Monitoring Activities and Mitigation Efforts. Wildlife Society Bulletin (1973-2006) 24:276-283.

Rost, G. R., and J. A. Bailey. 1979. Distribution of mule deer and elk in relation to roads. Journal of Wildlife Management 43:634-641.

Ruediger, W. C., and S. L. Jacobson. 2013. Multiple-use crossing structures for providing wildlife habitat connectivity. Page 14 in 2013 International Conferences on Ecology and Transportation. Available online at: http://www.icoet.net/ICOET_2013/proceedings.asp. ICOET, Scottsdale, AZ.

Sauer, J. R., J. E. Hines, and J. Fallon. 2004. The North American Breeding Bird Survey, Results and Analysis 1966–2003. Version 2004.1. Laurel, MD.

Siemers, J. 2002. A survey of Colorado's caves for bats. Prepared by Colorado Natural Heritage Program. Prepared for Colorado Division of Wildlife. Available: http://www.cnhp.colostate.edu/documents/2002/Cave_Inventory_report.pdf.

Siemers, J. L. 2009. Pygmy Shrew (*Sorex hoyi*) Survey on the White River National Forest 2009. Colorado Natural Heritage Program, Fort Collins, CO. 21 pp.

Siemers, J. L. 2012. Status Report on the Pygmy Shrew Survey of the Routt and White River National Forests. Colorado Natural Heritage Program, Fort Collins, CO.

Siemers, J. L., and D. J. Neubaum. 2015. White River National forest Bat Survey and Monitoring – 2015. Colorado Natural Heritage Program, Colorado State University, Fort Collins, Colorado.

Singleton, P., W. Gaines, and J. Lehmkuhl. 2002. Using a Weighted Distance and Least-Cost Corridor Analysis to Evaluate Regional Scale Large Carnivore Habitat Connectivity in Washington.in Proceedings of the International Conference on Ecology and Transportation, Raleigh, N.C.

Slater, G., and C. Rock. 2005. Northern Harrier (*Circus cyaneus*): A Technical Conservation Assessment. USDA USFS, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/northernharrier.pdf

Smith, B. B., and D. A. Keinath. 2007. Northern Leopard Frog (Rana pipiens): a technical conservation assessment. [Online] USDA USFS, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/northernleopardfrog.pdf.

Snook, L. 1993. Conservation of the Monarch butterfly reserves in Mexico: Focus on the forest. Pages 362-375.

Terborgh, J. 1992. Perspectives on the conservation of Neotropical migratory birds. Plenary Address. Pages 7-12 in Ecology and Management of Neotropical Migrant Landbirds. Papers from the Symposium on Ecology and Conservation of Neotropical Migrant Landbirds, Woods Hole, Massachusetts.

U.S. Fish and Wildlife Service. 1998. Status review of the northern goshawk in the forested west. Unpublished report. Office of Technical Support, Forest Resources, Portland Oregon. Available on the world wide web at: http://www.pacific.fws.gov/news/pdf/gh_sr.pdf.

USDA USFS. 2002a. Final environmental impact statement, Appendix N: Biological Evaluation of the Land and Resource Management Plan. 2002 Revision for the White River National Forest. Prepared by Crites, M.J., B.C. Johnston, and C. Hirsch. White River National Forest, Glenwood Springs, CO. 253 pp. plus appendices.

USDA USFS. 2002b. White River National Forest Land and Resource Management Plan 2002 revision. White River National Forest, Glenwood Springs. CO.

USDA USFS. 2009. Memorandum of understanding between the U.S. Department of Agriculture USFS and the U.S. Fish and Wildlife Service to promote the conservation of migratory birds. Page 13. USDA USFS and U.S. Fish and Wildlife Service, Washington, DC.

USDA USFS. 2016. Addendum: Memorandum of understanding between the U.S. Department of Agriculture USFS and the U.S. Fish and Wildlife Service to promote the conservation of migratory birds. Page 1. USDA USFS and U.S. Fish and Wildlife Service, Washington, DC.

USDA USFS. 2017. FSVeg 2017 Geographic Information System Vegetation Cover Type Data Layer.in F. S. US Department of Agriculture, Rocky Mountain Region, White River National Forest, editor. On file at the WRNF Supervisors Office, Glenwood Springs, CO, Denver, CO.

USDA USFS. 2018a. Index of Species Evaluated for Rocky Mountain Region Sensitive Species List. Available: http://www.fs.fed.us/r2/projects/scp/sensitivespecies/index.shtml. USDA USFS Rocky Mountain Region, Golden, CO.

USDA USFS. 2018b. Supplement No. 2670-2018-1 to Chapter 2670, Forest Service Manual. USDA USFS Rocky Mountain Region, Denver, CO. 26 pp.

USDA USFS. 2018c. Rocky Mountain Region: White River National Forest Endangered, Threatened, Proposed, and Sensitive Species. April 3.

USDA USFS. 2019. The Monarch Butterfly in North America. Available at: https://www.fs.fed.us/wildflowers/pollinators/Monarch_Butterfly/.in U. F. Service, editor. Celebrating Wildflowers.

Vaughan, T. A. 1969. Reproduction and population densities in a montane small mammal fauna. University of Kansas Museum of Natural History, Miscellaneous Publications 51:51-74.

Verner, J. 1980. Bird communities of mixed conifer forests of the Sierra Nevada. Pages 198-223 in Workshop proceedings: management of western forests and grasslands for nongame birds. USDA USFS General Technical Report INT-86, Ogden, UT.

Weber, W. and Wittmann, R. 2001a. Colorado Flora: Eastern Slope. Third edition. University Press.

Weber, W. and Wittmann, R. 2001b. Colorado Flora: Western Slope. Third edition. University Press.

Wickersham, L. 2007. Colorado Breeding Bird Atlas II. San Juan Institute of Natural and Cultural Resources. Durango, Colorado. Found online at http://www.cobreedingbirdatlasii.org.

Wiggins, D. 2004. American Three-toed Woodpecker (*Picoides dorsalis*): a technical conservation assessment. USDA USFS, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/americanthreetoedwoodpecker.pdf, Denver, CO.

Young, M. K. 2008. Colorado River Cutthroat Trout (*Oncorhynchus clarkii pleuriticus*): a technical conservation assessment. [Online]. USDA USFS, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/coloradorivercutthroattrout.pdf.

APPENDIX A

OFFICIAL USFWS LIST OF THREATENED AND ENDANGERED SPECIES THAT MAY BE AFFECTED BY THE PROPOSED PROJECT (IPAC) WITH MIGRATORY BIRDS

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Western Colorado Ecological Services Field Office
445 West Gunnison Avenue, Suite 240
Grand Junction, CO 81501-5711
Phone: (970) 243-2778 Fax: (970) 245-6933
http://www.fws.gov/mountain-prairie/es/Colorado/
http://www.fws.gov/platteriver/

In Reply Refer To: May 28, 2019
Consultation Code: 06E24100-2017-SLI-0400
Event Code: 06E24100-2019-E-00791
Project Name: I-70 West Vail Pass Safety Improvements

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

To Whom It May Concern:

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

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

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

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

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

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

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

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

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

Attachment(s):

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

Official Species List

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

This species list is provided by:

Western Colorado Ecological Services Field Office
445 West Gunnison Avenue, Suite 240
Grand Junction, CO 81501-5711
(970) 243-2778

Project Summary

Consultation Code: 06E24100-2017-SLI-0400

Event Code: 06E24100-2019-E-00791

Project Name: I-70 West Vail Pass Safety Improvements

Project Type: TRANSPORTATION

Project Description: The overall purpose of the project is to improve safety on West Vail Pass including decreasing the number
of accidents, reducing erratic driving behavior due to speed differentials, and reducing speed differentials.
Detailed goals will be defined by the Project Leadership Team.
Preliminarily, this project is intended to
produce the following improvements:
A. Environmental – minimize environmental effects
B. Follow context sensitive guidelines and principles
C. Improve Safety and Quality of Multi-Use Trail
D. Implement Black Gore Creek SCAP

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/39.58642390355746N106.24443565519564W

Counties: Eagle, CO | Summit, CO

Endangered Species Act Species

There is a total of 9 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 4 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Canada Lynx *Lynx canadensis* Population: Wherever Found in Contiguous U.S. There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3652	Threatened

Birds

NAME	STATUS
Mexican Spotted Owl *Strix occidentalis lucida* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8196	Threatened
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **proposed** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

Fishes

NAME	STATUS
Bonytail Chub *Gila elegans*	Endangered

There is **final** critical habitat for this species. Your location is outside the critical habitat.
This species only needs to be considered under the following conditions:

- Water depletions in the upper Colorado River basin adversely affect this species and its critical habitat. This species does not need to be considered if the project is outside of its occupied habitat and does not deplete water from the basin.

Species profile: https://ecos.fws.gov/ecp/species/1377

Colorado Pikeminnow (=squawfish) *Ptychocheilus lucius*	Endangered

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

- Water depletions in the upper Colorado River basin adversely affect this species and its critical habitat. This species does not need to be considered if the project is outside of its occupied habitat and does not deplete water from the basin.

Species profile: https://ecos.fws.gov/ecp/species/3531

Greenback Cutthroat Trout *Oncorhynchus clarkii stomias*	Threatened

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

Humpback Chub *Gila cypha*	Endangered

There is **final** critical habitat for this species. Your location is outside the critical habitat.
This species only needs to be considered under the following conditions:

- Water depletions in the upper Colorado River basin adversely affect this species and its critical habitat. This species does not need to be considered if the project is outside of its occupied habitat and does not deplete water from the basin.

Species profile: https://ecos.fws.gov/ecp/species/3930

Razorback Sucker *Xyrauchen texanus*	Endangered

There is **final** critical habitat for this species. Your location is outside the critical habitat.
This species only needs to be considered under the following conditions:

- Water depletions in the upper Colorado River basin adversely affect this species and its critical habitat. This species does not need to be considered if the project is outside of its occupied habitat and does not deplete water from the basin.

Species profile: https://ecos.fws.gov/ecp/species/530

Flowering Plants

NAME	STATUS
Ute Ladies'-tresses *Spiranthes diluvialis*	Threatened

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/2159

Critical habitats

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

USFWS National Wildlife Refuge Lands And Fish Hatcheries

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

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

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

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

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

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31
Brewer's Sparrow *Spizella breweri* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9291	Breeds May 15 to Aug 10

NAME	BREEDING SEASON
Olive-sided Flycatcher *Contopus cooperi* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31
Rufous Hummingbird *selasphorus rufus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8002	Breeds elsewhere
Willow Flycatcher *Empidonax traillii* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/3482	Breeds May 20 to Aug 31

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

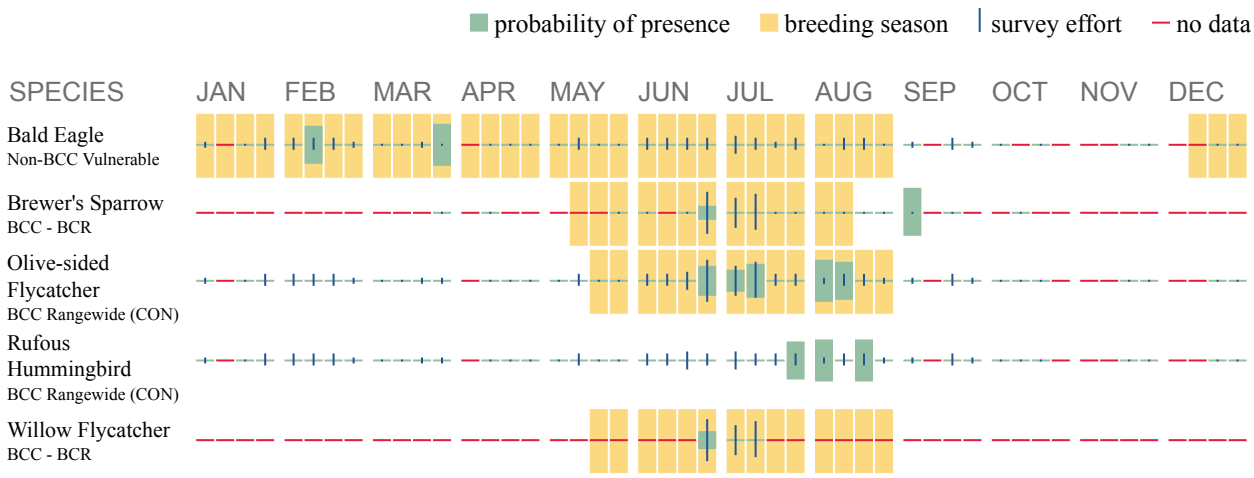
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php

- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.
Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?
The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

Wetlands

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

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

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER EMERGENT WETLAND

- PEM1B
- PEM1C
- PEM1Ch

FRESHWATER FORESTED/SHRUB WETLAND

- PSSA
- PSSB
- PSSC
- PSSBb
- PSSCh

FRESHWATER POND

- PABGb
- PABF
- PABFh
- PABG
- PUBFx
- PUBGh

LAKE

- L1UBHh

RIVERINE

- R5UBH
- R3UBG
- R3UBH
- R3UBHx
- R4SBC
- R3USA

- R5UBFx

APPENDIX B

ALIVE ITF, SWEEP ITF, AND AGENCY MEETING MINUTES

Project: 21685 CDOT R3 West Vail Pass Auxiliary Lanes

Purpose: US Forest Service Scoping Meeting

Date/Time: July 19, 2017

Location: CDOT R3 and Phone

Notes by: Hannah Polow and Kara Swanson

Attendees:

US Forest Service: Jen Austin, Carole Huey, Tom Fuller, Donna Graham, Kristen Pelz, Miles Barkhurst, Matt Grove, Aaron Mayville

CDOT R3: Mike Vanderhoof, John Kronholm, Cinnamon Levi-Flinn

FHWA: Stephanie Gibson

Colorado Wildlife Science: Jonathan Lowsky

AlpineEco: Andy Herb

David Evans and Associates (DEA): Hannah Polow and Kara Swanson

Matt Klein and Paula Peterson weren't able to make the meeting.

1. Introductions

2. Project overview

- Mike provided an overview of the project including historic work already completed associated with the project. CDOT and FHWA undertook a PEIS from Golden to Glenwood Springs and identified a number of improvements throughout the entire corridor. One of the recommendations was to implement auxiliary lanes on West Vail Pass from MM 180-190. We will complete a Tier 2 EIS for this project. In 2006, EA was initiated to investigate difference of speed.
- This project will require a template EA, which is more concise than some other environmental documents. It will include an introduction, alternatives in an appendix and impact analysis in table format.
- Will do some field work this summer with some completed next summer as well.

Question (Carole): Will all of the work be within the Highway Easement Deed (HED)?

Answer (Mike): We are assuming that most of the work will be within the HED but there may be things outside the deed. A possible wildcard are the bad curves throughout the corridor. We are going to address the feasibility of fixing some of those curves as part of this project.

3. Current status and schedule

- CDOT intends on inviting US Forest Service (USFS) as a cooperating agency.
- CDOT wants to get a sense of field work that we should do. In 2006, we did a fair amount of field work but want to make sure we cover all the pieces.

Project leadership team (PLT) initial meeting is next week and then additional PI activities will follow that meeting. 4. Review consultant team natural resource specialists

- AlpineEco has experience focusing on wetlands for this type of project. Has experience working on another similar project. Andy's analysis will include wetlands and rare plants.
- Colorado Wildlife Sciences will be focusing on wildlife and fisheries. Jonathan has a bunch of NEPA experience with Forest Service, CDOT and FHWA. Stick to wildlife.
- Mead and Hunt will lead the historic work (Dianna Litvak).
- Archeology and paleontology will be done in house.

5. Resource discussion

a. Wetlands

Question (Mike): Who is surveying plants?

Answer (Kara): AlpineEco with the help of someone who specializes in plants.

Question (Kristen): Were you the people who did the surveys in 2006?

Answer (Kara/Mike): No.

Question: Study area is not going to expand that much more from the I-70 corridor, right?

Answer (Mike): We are going to try to do that in the maximum way possible. But if we are coming up to a bridge, we might have to swing out or construct something right next to an existing facility. There may be some situations that may move the road a little bit. The original study area was pretty conservative and we are probably going to narrow it a little bit.

Answer (Kara): We anticipate the study area being 100 to 200 feet from pavement. Noise would have a slightly different study area since it would be based on receptors.

Question: Have you all done any preliminary assessment for grading?

Answer (John): Someone did do some initial analysis of this and there would be an impact.

Question: Do you have landscape architect?

Answer (Kara): Yes.

- The consultants are preparing most of the technical reports and then specialists from CDOT will be involved in the project to provide guidance and oversight. We want to make sure we're all in good communication. Before work goes out to the public, information will go to USF S and FHWA first.

Question (Stephanie): We are making the assumption that USFS wants to be a cooperating agency. Is that the case?

Answer (Aaron): Yes, that makes the most sense for this project.

b. Wildlife

- There is a concern associated with an increased barrier as a result of the climbing lanes.
- The ALIVE community has a bunch of crossing opportunities identified and want to make sure those are seriously considered to assist in the crossing of Lynx.

- Would be good to have crossing opportunities on east side or on the other side of Vail Pass. Covers much of the study area (MP 182-193).

Question: How were Lynx originally addressed in the 70s?

Answer (Jonathan): Lynx populations weren't really an issue then, so didn't really address it.

Answer (Mike): ALIVE has a lot of ideas on this. Proposed wildlife crossing at 192.3 or 192.6 and it's a location where you cross westbound lanes and eastbound bridge. Decided not to include this in this project because it might run down to Copper as well.

- There were two Lynx killed here. So it's a problem.
- ALIVE committee will be convened for this project.
- There are additional recreation issues that we'll need to work out as well. Maintenance issues need to be work out. This project is an example of exceptions from the exemptions. The whole roadway is eligible for the National Register because it's one of the first examples of CSS.

Question (Jen): ALIVE committee—will impact mitigation be implemented?

Answer (Mike): If there are more lanes, yes we know that is a barrier effect. If you asked me if there would be game fence, I would say yes but I don't know exactly. Mile posts 181/182 has a wildlife crash spike.

- We will need to review the Linkage Interference Zones (LIZ) recommendations.

Question (Jonathan): Make camera information available?

Answer (Cinnamon): It wasn't me per se. Julia Kintsch had videos out there looking at presence/absence. She is trying to find some of those archival photos. Still need to reach out to Paige Singer, who has done more research recently. She is going to reach out to her about photos and locations. Do have information, some is old and some is newer. Some cameras were approved near MP 192 for the overpass.

Action: Cinnamon to follow up with Julia and Paige about information available. Then everyone will have a conversation about other camera locations.

Action: Kara will set up conversation internally (with Cinnamon and Jen) to discuss what they need for the game cameras. Jen will see Julia next week and will touch base with her about this.

Question (Mike): If we can find some different photos from different years will that actually be helpful information?

Answer (Jen): Aware of the data on the east side of Vail Pass, and this data sounds old but old data is better than no data.

- ALIVE has identified MP 187.4 and 185.5 for camera locations. We need to figure out the camera locations ASAP.

Action: Jen and Jonathan to coordinate on cameras and work through CDOT on locations.

Action: Jonathan to get collar information that is available for Lynx. He is reaching out to the conservation manager for the state. This will highlight some of the areas that are used the most. I think what Jen's looking for is if they are crossing now.

Question: If we put up all the cameras, is the purpose really to figure out the mitigation of the lanes opposed to determine whether the aux lanes will happen at all?

Answer (Stephanie): We mitigate for impacts that we have. If there is additional mitigation identified by the Forest Service, that would be have to be paid for by USFS.

Answer (Mike): FHWA decides about the lanes. CDOT and FHWA has the authority to do this, but need approval from the USFS. But in general, we're going to move forward with installing auxiliary lanes unless we run into severe opposition. It's not guaranteed but it's moving forward. We wouldn't be putting out game cameras out to determine whether we do aux lanes, it's to determine whether FHWA needs to do mitigation.

- (Aaron): Good clarification for this type of project. And that's a good point for us as far as us being a cooperating agency to provide feedback and review.

Question (Mike): Any critters with specific windows for field review?

Answer (Jonathan): We started a little late but luckily we have elevation on our side. Songbirds and raptors are a little later on being delayed. Missed window for toads (but USFS has that information). Western bumble survey is through the end of July. Boreal owls, Lynx, and other species can be done in the winter. And then endangered fish information.

c. Cultural

- USFS: No problem with what we're going to do. The other CDOT work that the USFS has reviewed has been exceptional.
- Highway has already been identified as location on historic register. We already know it's potentially eligible for the National Register.
- Dianna will go through the process necessary for the historic component.
- Mike: Trying to get CDOT to do context study for Glenwood and Vail Pass. Headquarters will help with context. Old US 6 is a separate historic resource. So if we do have impacts there, we'll deal with that separately.
- We'll just have to see which elements are impacted based on the improvements.

Question (Mike): Would it be possible to change path to the other side of the highway?

Answer (Tom): That's generally where the cultural resources are. But did review pieces for this during the East Vail Water Quality Project. The sites that could have been impacted were already determined to be non-eligible. Everything is looking good. Might be stuff at Black Gore Lakes. Don't know of anything super significant.

- Mike talked to Dan Jepson (CDOT Cultural Resource Lead) last week and discussed the possibility that CDOT might reconstruct the Vail Pass rest area. We understand there were significant archaeological finds in that area. Environmental clearance for the rest area will be part of the environment review, but might be constructed separately in phasing.
- For the bike path, we were going to assume that we could never shut down the bike path. It always has to be open.

Question: Is there any resolution on who deals with the bike path?

Answer: No resolution. It's a partnership between the USFS and CDOT.

- If we're going to keep it open all the time. If we widen the highway at all in certain areas, we would have to move the bike path. We could use some walls if we are going to move the bike path.

Action: Mike/team to follow up on recreation and other resources with Stephanie since she had to leave the call for another meeting.

- The issue with the bike path and rec area at the top of Vail Path is that they are protected by Section 4(f) and FHWA has to adhere to a lot of regulations. If we keep trail open, we may be able to get an exception from Section 4(f). If we have to shut the bike path down, our options are reduced.

Question: All field work completed this summer? And does the 18-month schedule include construction?

Answer (Mike): Field work will be completed this summer, but there's a chance to do some work next summer as well. No construction will happen within the next three years. Need to have at least 30% design before get NEPA decision. There's not construction funding currently identified right now. Going to try to get the design/NEPA and then identify money.

Question (Aaron): What is estimated cost of the whole project?

Answer (Mike): PEIS says it would be $300M but it's likely up to $450M. Tried to make it as low as $225M for the recent transportation bill but don't really know.

d. Visual

- Vail Pass has made a lot of extra efforts to make it fit into the landscape. So when you start adding another 40 feet for lanes, seems like a lot of cut and fill. Important to get it to blend into what is already there and consistency with what is already there. Want to make sure it looks like we didn't add anything.
- Kara: the visual impact guidance has been recently updated and we understand how important it is.
- Donna: Worked on Iron Springs project and a lot of extra effort to make it blend in, so understand the process we will be going through to make this happen.
- Mike: PEIS did identify some CSS. It would be an adverse effect if we didn't follow that. Understanding any visual qualities that they want will be important to include.

Question (Donna): Will there be visual simulations for major structures or grading?

Answer (Mike/Kara): Yes. It will be important for us to convey what the new project is going to look like from multiple locations.

e. Toads/Fish

- Boreal toad site is right below study area (MM 179). Probably have 10+ years of data on this site (they coordinate with CPW on data). Don't really have any habitat on the other side. No problems with beetles. Outskirts talking about dispersal for construction—1.5 miles. Haven't seen the adults moving into the mountains but they are not moving past the cliffs and so they are confined to this little area. Haven't heard about any mortality on the bike path. They are also not crossing the creek. USFS has a lot of data they can share and don't have a lot of concern with this project.

- All fish within the study area are blue lineage fish. (There are no green lineage fish). Closest green population we would have is probably over in Dillon. They are in tributaries to Gore Creek.

Question: Is there a water depletion requirement?

Answer (Mike): wouldn't surprise me if we do this.

- Water depletion process would require a description and then get approval. There are withdrawl limits that trigger the need for reporting on depletion.
- We have done a ton of work in this area for controlling sediment and keeping it out of Black Gore Creek. Expanding 20 feet could eliminate some of the basins that are there.

Question: How do we work in here?

Answer (Mike): Going to have to be a challenge to our design team to be a mitigation given the limited space there is to work in.

Question (Matt): If we can't mitigate it here, can we do it somewhere else and can we do it elsewhere? Have done a lot of work to reduce sediment. Would it affect Basin of Last Resort?

Answer (John): Have talked about using US 6 as detour but no we wouldn't change access. Would strive to mitigate on-site.

- Wetlands affects the same thing. If we have wetland mitigation, that would be hard to do onsite. Might be good to do something for off-site mitigation. Biggest thing is to minimize impacts of sediments.

Question (Aaron): Have you brought in Vail about this project?

Answer (John): Greg Hall is invited to be a member of the PLT but haven't had a pre-scoping meeting with them.

- Have been working with them on a number of things, including water quality.

Question: Do sediment ponds include mag chloride?

Answer (Matt): Just sediment. Can't really test for mag chloride. Haven't really seen negative effects in the aquatic life.

<u>f. Plants</u>

- Significant populations of oxide daisy. This work has the potential to get rid of this plant as part of this project.
- Documented moonwart (at MP 184.5 or 185.4). That specific species was considered sensitive, but is no longer. There are separate species of moonwarts, including three that are protected. So we need to do pretty comprehensive surveys to see if they are out there. Don't think there are any other sensitive species in the area.
- There are some fens and some high quality fen near the rest area. There are a lot of wetlands in the ditches near the highway. Need to work with Tom Probart on this.
- Pollination friendly vegetarian would be great to put in after the project is completed.
- Seems like a reasonable project since it's a congested area.
- Andy: I think there is really suitable habitat of moonwarts all along the highway.

- We can assume presence but need to know if the three particular species are sensitive. Rumored that there might be some out here (Kristen will see if she can find out the location). They like disturbed areas and don't think it's likely that there are the three sensitive species.

Action: Kristen to ask to see if she can determine where the rumored moonwart was located.

- Andy: Suitable habitat all along the corridor. Need to do a survey for sensitive species and if they find any, will have locations. Would be a significant effort to survey (probably three weeks with a crew).

Answer (Mike): Could do some sampling?

Answer (Andy): They are pretty much everywhere but not necessarily the sensitive species. It takes close examination to determine which species. Would have to get moving quickly since the season is through mid-August.

- Tom: Tribes are also concerned about plants as well.
- Mike: When we first started the project, none of the tribes responded but we will be reaching out again through FHWA.
- Mike: Seems like moonwart is a self-mitigating (grows well in disturbed areas) so it wouldn't be a barrier to get this approved from that perspective.
- Longer term doesn't look like it would be a negative impact.

Question (Andy): Does the orchid have any legal status?

Answer: No, doesn't have any legal status.

- We can get Andy contracted to do wetlands information (which is until the end of growing season/October) but probably not for the moonwarts.

g. Recreation

- Aaron: moving bike path away from highway would be a positive thing.

Question (Mike): Would this throw us into an EIS?

Answer (Aaron): It might but there might be option to do some minor changes. Not looking to clear through a whole hill.

Additional considerations:

- Coordination with rec events (will give us event information).
- Also some that use Vail Pass for parking area.
- How would it affect Black Lakes in Vail Pass?
- Vail Pass is quite a hub for recreation. Looking at installing a parking kiosk at the top of Vail Pass. Looking at this as a pilot program.
- How this might affect Gore Creek campground—take reservations 200 days in advance. So need to know what's going on.

- John: If we were to send traffic down old US 6, it would be hard to access the campground. The quality would be impacted. Would likely do downhill for this detour. If we send traffic down US 6, probably want to close that campground.
- Aaron: Tell us what you need and we will make things work.
- Mike: if got into the Section 4(f) process, would have to do alternatives process, coordination, FHWA would have to determine no other option feasible. It would be pretty substantial effort to make everything work.
- Aaron: Not our number one choice to shut down the campground for whatever amount of time is necessary but we can make something work if we need to. We can talk through it.

Question: Are detour options are evaluated as part of the NEPA process?

Answer: We will have to evaluate detour options for phasing and impact purposes.

Question (Aaron): How long would the detour be in case that would affect the campground?

Answer (John): It really depends on the bridges and if they need to be replaced.

- Aaron: It's a concession-based campground so there would be revenue loss that we would have to consider.

Question: Then how does that affect the path bike?

Answer (Mike): We can't close the bike path.

Answer (John): Could maybe use concrete barriers along the old US 6 to separate cars.

Question (Aaron (from Matt)): Is SF299 needed or appropriate?

Answer (Carole): That's a good question because we've got the ROW set up and if we do modifications outside of the deed (HED), do we need to amend it? It's really hard to keep track of all the amendments. Would be good to have a shapefile to go along with the boundary. Probably do an amendment and letter of consent. SF299 is nice to have so we can see the whole project. The big book that FHWA approves would be sufficient as well.

Action: Aaron will look to see if there will be cost recovery fees and follow up to see if they are pursuing that.

- Jen: Would still like to be part of the ALIVE committee.

Question (Miles): Any possibility with design and implementation for need or potential request for federal rock request or disposal?

Answer (John): Hasn't been discussed yet.

Answer (Mike): I would think so but not sure how to answer that question. CDOT doesn't like to claim materials because then it can be a liability issue. We can prohibit staging on federal lands. Normally don't like to do so with borrow areas. We'll put this on the list and run it forward. We need to make sure we describe things from occurring from an environmental standpoint. CDOT has been burned in the past by having named borrow area and then it doesn't pan out and we have to pay the contractor.

- Miles: This question is coming from a project from Oregon. We are leaning on the contractor to figure out their source.

- Mike: We should keep it on our list. Depending on the contracting method (CMGC) We might have a contractor on early enough to hear this information but we may not have that. We should think about possible quarries.

Question (Aaron): Would construction happen during the winter as well?

Answer (John): I anticipate a winter shutdown. The weather is crazy out here.

Question (Carole): If FHWA funds this, do you get it all at once so the project wouldn't run out of funding?

Answer (Mike): CDOT gets maybe $500M statewide but it's not likely that the project would be wholly funded by FHWA or that they would give us the full amount of money for the project. Almost guaranteed that the project will be done in different phases. Whatever we build would have to be usable.

Action: Make sure to include John, Mike and Kara on all communications.

MEETING NOTES

PROJECT:	21685 I-70 West Vail Pass Auxiliary Lanes
PURPOSE:	ALIVE Issue Task Force (ITF) Meeting #1
DATE HELD:	April 18, 2018
LOCATION:	Miller Ranch Community Center, 25 Mill Loft Road, Edwards, CO
ATTENDING:	Joel Barnett, FHWA Martha Miller, Program Engineer, CDOT Region 3 John Kronholm, Project Manager, CDOT Region 3 Karen Berdoulay, Resident Engineer, CDOT Region 3 David Caesark, Environmental Manager, CDOT Region 3 Jeff Peterson, CDOT Paige Singer, Rocky Mountain Wild Alison Deans Michael, USFWS, Colorado Field Office David Singer, CDOT Jonathan Lowsky, Colorado Wildlife Science Mark Hablitzell, Town of Vail Julia Kintsch, ECO-Resolutions Cinnamon Levi-Flinn, Biologist, CDOT Regions 3 Craig Wescoatt, Colorado Parks & Wildlife Bill Andre, Colorado Parks & Wildlife Jen Prusse, US Forest Service Greg Hall, Town of Vail Don Connors, Consultant Project Manager, Amec Foster Wheeler/Wood Kara Swanson, Consultant Environmental Task Lead, David Evans and Associates Matt Figgs, CDOT Region 3
COPIES:	Attendees

SUMMARY OF DISCUSSION:

(Please Note: Action items are shown In ***bold italics***.)

1. **Introductions & Agenda Review**
    a. John did introductions, covered the agenda, and talked briefly about the purpose of today's meeting, which is to discuss wildlife on the West Vail Pass corridor and receive input from the members of the ALIVE (A Landscape Level Inventory of Valued Ecosystem Components) Issue Task Force (ITF).
2. **Agenda and Goals**
    a. John covered the agenda and discussed the goals of today's meeting
3. **Project Background**
    a. John discussed the background of the project including highlighting the I-70 Mountain Corridor Programmatic Environmental Impact Statement (PEIS), the

recommendations from the PEIS (including stipulations in the ALIVE Memorandum of Understanding [MOU]), the Tier 2 NEPA process, and the past 2007 Environmental Assessment (EA) for the West Vail Pass area

i. He explained that this project is the Tier 2 NEPA process as it address site specific details for West Vail Pass

ii. Don added that the PEIS identified the auxiliary lanes for safety purposes, not for capacity

4. CSS Process/ITF Responsibilities

a. John outlined the Context Sensitive Solutions (CSS) process that the Project Team is following for this project and what stage the project is at in the process

i. The Project Team has gathered information from the Technical Team (TT) that is being considered for the development of alternatives that will then be screened through a screening process

ii. He also highlighted the Success Factors that the Project Team, in conjunction with the Project Leadership Team (PLT) and TT, have developed. The specific Core Values that have been established for the project were also discussed.

b. John covered the roles and responsibilities of the various ITF groups which come directly from CDOT's CSS guidance. There are other roles and responsibilities that are a part of the ALIVE MOU that will be covered later in the presentation

i. He explained that the intent of an ITF is to focus on a specific issue

ii. David Singer added that this ALIVE ITF is comprised of experts for this specific issue, and the results of this discussion will then be reported to the TT which is comprised of a broader diversity of backgrounds and expertise

5. Current Project

a. John discussed the limits of the West Vail Pass Auxiliary Lanes project and talked to some of the unique characteristics along the corridor.

i. The elevation of West Vail Pass summits at 10,603 feet

ii. There are several sections of steep grades which are at 7%

iii. There are areas of substandard roadway geometry with some compound curves that were designed for a 55 mph speed limit (the current speed limit is 65 mph)

iv. There are 23 different retaining walls totaling 23,515 linear feet

v. There are 16 bridges that make up 1.6 miles of the corridor

vi. The Vail Pass/Tenmile Canyon National Recreation Trail sits in the corridor. This paved bike trail gets 39,000 annual users with a peak daily count of 3,500 users

vii. West Vail Pass is the access point for the Vail Pass Winter Recreation area which saw 56,000 users in the 2016/17 winter season

viii. There are numerous wetlands and waters of the US in or near the corridor including Black Gore Creek. There is also considerable wildlife activity in the lower five miles of the corridor.

ix. There is a Sediment Control Action Plan for Black Gore Creek that another ITF will discuss implementing

x. The West Vail Pass corridor is subject to Section 106 of the National Historic Preservation Act as it is a nationally and exceptionally significant feature of the federal interstate system. West Vail Pass was one of the first highways to purposefully sculpt cut-and-fill slopes to fit in its unique setting, as well as being one of the first to use precast and cast-in-place segmental bridges.

xi. 80% of the project is within the White River National Forest

xii. 20% of the project runs through the residential portion of east Vail

xiii. The weather on the west side of the pass is a challenge as this side routinely sees more snow than the east side of the pass

b. John talked about the topography and layout of the interstate on the corridor with sections that are barrier separated, have a retaining wall in the median, open in the median, and bifurcated.

c. He then covered the Purpose & Need of the project which is to improve the safety and traffic operations for both eastbound (EB) & westbound (WB) directions of West Vail Pass

i. He highlighted several specific safety and traffic operations issues that exist on the pass that have necessitated this project

ii. He talked about the Level of Service of Safety (LOSS), which compares West Vail Pass to all rural, mountainous 4-lane divided highways. The safety assessment that was completed for this project showed that every section of West Vail Pass has a moderate to high potential for crash reduction. Improvements made to the corridor have the potential to significantly reduce crashes on the interstate as this section of highway is significantly worse that other similar sections.

iii. David S asked why the bridges are a specific crash problem

1. John replied that the bridges ice over and some of them are on substandard curves, which lead to a lot of crashes

iv. Joel asked what the red circles on the crash chart on Slide 26 represented as there are other peaks in the chart

1. John replied that those areas are where the high crash rate corresponds to substandard geometry

d. John covered the crash distribution by type from 2014 to 2016. He highlighted that only 5.4% of crashes over that timeframe that are officially recorded (i.e. they cause property damage and/or injuries) are from wildlife collisions

i. He highlighted the specific wildlife crash data on the West Vail Pass corridor. Most of the collisions occur on the lower half of the corridor where it is most permeable (with the 8 pairs of sister bridges). Very few collisions occur on

the upper half of the pass where there is nearly no permeability. The East side of Vail Pass has a similar amount of crashes as the lower half of West Vail Pass.

ii. Most animal collisions are in dry and dark conditions, in the WB direction, and with deer

1. Bill added that it's important to note that these are only crash numbers that are reported to State Patrol (CSP). Vehicles that hit animals and drive away are not shown in this data and would add a significant amount of hits
2. John showed a graph of data collected from a different source (CDOT's Road Kill Report where maintenance reported dead animals on the side of the interstate)
    a. The trends generally stays the same as CSP's data except with a spike at MM 190
3. Greg added that Vail Police has data on animal hits from MM 180-182 that would be available if needed
    a. Bill replied that Colorado Parks & Wildlife's (CPW's) reports show two to three times the amount of bear hits than CDOT or CSP due to their mandatory reporting of bear kills
        i. He added there are studies that may show as little as 30% of animals that are hit on the interstate are reported
    b. Dave Cesark asked if CPW has a dataset they could give to the Project Team
        i. Bill replied CPW has good data on bears, lions, and moose, but not on other animals.
        ii. ***The Project Team will reach out to Bill to gather their wildlife crash data***
4. Julia added that some of the half-mileposts are missing, so some data may be incorporated in a 1 mile data point, showing an artificial spike at that location possibly
    a. She added that the bridge at MM 182.5 does have an opening underneath, but it is over a large, steep gorge that doesn't allow for animal permeability. Not every bridge can be considered permeable due to the terrain in the area.
5. Greg asked if the CDOT Road Kill Report noted direction of travel
    a. John replied that CDOT's Road Kill Report does not note direction, but CSP's crash data does
        i. The group noted that the WB direction is where the traffic moves the fastest on the steep downhill areas and may be the reason there are more animal-vehicle collisions in that direction

6. **ALIVE MOU Review**
    a. David S talked about the ALIVE MOU background
        i. He said that the interstate has always been a barrier for wildlife, and an ALIVE committee was formed to work on making sure this barrier issue did not get worse with future improvements
        ii. The intent was to go beyond the bare minimum to improve wildlife conditions and permeability with projects
        iii. It also established roles and responsibilities noted below:
            1. CDOT/FHWA: integrate the ALIVE process into Tier 2 projects and create design criteria so projects don't prevent improving permeability
            2. BLM/US Forest Service: be aware of the ALIVE requirements as they perform their land management functions
            3. US Fish & Wildlife Service (USFWS): Champion the protection of streams and aquatic life on projects
            4. CPW: cooperation, consultation, data sharing, monitoring, and promoting mitigation measures on projects
7. **LIZ Review – 2003 and 2011**
    a. David S spoke to the Linkage Interference Zones (LIZs) that were identified as part of the ALIVE process along the I-70 Mountain Corridor
        i. In the 2003 study, 13 LIZs were identified along the corridor.
            1. Recommendations for improvement were also made at specific Mile Markers (MMs), including for sections of West Vail Pass
        ii. In 2011, the PEIS Record of Decision adopted the ALIVE MOU and further refined the LIZs
            1. CDOT wanted to bolster the original findings and have a more data driven method to update the LIZs which lead to 13 zones becoming 7, and the actual mileage of LIZs was reduced as well
            2. The specific MM recommendations were also refined with this update, and an implementation matrix was created to help projects think about how to advance ALIVE efforts
        iii. Bill added that there is probably 50% less animal populations in Eagle County compared to when the original LIZs were created, so it is hard to compare recent data with this older data
            1. John asked if there was data to back this statement up
            2. Bill stated CPW does have this and can supply that to CDOT if needed
8. **ALIVE Implementation Matrix Review**
    a. Kara referred the group to the ALIVE implementation matrix handout for this section of the presentation. The West Vail Pass project is currently in the Project Development phase on that matrix.

i. She highlighted the different considerations that the Project Team will be looking at as alternatives are developed, as well as the desired outcomes and products that will come out of this effort. She pointed out that the project is working through the NEPA and EA phase and is not jumping to final design

9. Current Surveys and Data

a. Jonathan talked about the different background data sources that the Project Team will be referring to as alternatives and design options are being developed.

i. He added that deer are the best indicator of hits along the corridor and may be focused on

ii. There will be a lot of communication from the Project Team to the different agencies as this data is being collected

b. He also discussed some of the field work that has been done to date and the remaining surveys that are still to be completed

i. Bill asked why boreal toads are being surveyed as their common habitat is outside of the project limits

1. Jonathan replied that while their breeding habitat is outside of those limits, not enough is known about adult habitat, so the project team thought it'd be good to survey for them

ii. Bill asked if peregrines will be surveyed

1. Jonathan said they have not been surveyed yet, but they can. He added that in his work with CPW, lynx will be looked at but not wolverine

2. Alison added that the USFWS & CPW has good lynx data

iii. Jen asked if the accipiter survey results were positive

1. Jonathan replied that it was not positive

iv. Bill asked what distance off roadway was for these surveys

1. Jonathan said the team looked 250 feet from the edge of the roadway

v. Greg asked why the survey didn't go down to MM 180 and stopped at the Gore Creek campground

1. Jonathan replied that every time they went out, there were too many people and dogs for any wildlife to really be west of the campground, and no activity was noticed in the winter. Once he got further uphill, he started to notice a lot of animal sign

10. Discussion

a. **LIZ and Aquatic Recommendations**

i. Kara presented the current LIZ & Aquatic recommendations from the 2011 ALIVE update and asked to hear feedback from the ITF on what the Project Team should be considering while considering alternatives and design options

ii. She covered LIZ G (MM 180.9-182.1)

1. These recommendations are focused on coordination with the East Vail neighborhoods and includes fencing removal and concentrating human activity
2. Bill stated that the fence near MM 181 has been down for many years for an elk that was moving through that area. The fence wasn't long enough to begin with
    a. He added that mule deer, bighorn sheep, & lion should be added to the secondary target species, and that leopard frogs haven't ever been found in Eagle County
3. Alison added that the Project Team should consider wildlife movement while some of the SCAP features are being designed. As sediment ponds with standing water next to the interstate attract animals, this could draw wildlife closer to the road and increasing the risk that they get hit
    a. Several in the group concurred with this statement and encouraged the Project Team to consider this
    b. John replied that the values of many concepts may conflict and coordination will be vital In order to come up with the best improvements with the Core Values in mind
    c. Bill added that depending on where fence goes and where the ponds are, if a pond is on the proper side of the interstate it could be a benefit to keep animals from crossing the road. Coordination between the Project Team and the ITF to review items like this will be needed as the project progresses
4. John added that this LIZ does not specifically address wildlife fence and asked the ITF for their thoughts on this potential feature
    a. Julia said that fencing should be on the table for this segment especially since many of the wildlife crashes take place in this area
    b. Greg pointed out that the trails in this area don't undergo seasonal closures, so humans are there year round
    c. Jonathan added that the high recreation usage in this area may cause deer and other wildlife to cross the interstate to avoid human interaction

iii. John next covered the recommendations specified for LIZ H (MM 182.9-188.1). The recommendations here include maintaining connectivity in the western portion of the LIZ and adding permeability for the eastern portion of LIZ, as well as fencing additions

1. John asked the ITF group about the MM 183 culvert and if this should be removed as recommended

a. Julia stated that all of these recommendations from the 2011 report should be reconsidered and reanalyzed in light of new data and knowledge.

2. John asked about the next four recommendations which cover fencing between bridges to direct wildlife to cross under those structures and not on the interstate
    a. Bill stated that the biggest problem with fencing is that is has to be maintained (especially with snow, people trying to get through it, and vehicles crashes). He suggested that a more permanent wall would be better for the pass than traditional wildlife fencing
    b. Craig added that any break in a wall/fence would be the spot an animal will cross. Continuous fencing between those bridges is very important. He added that when holes are created in a fence and they get through, animals are not good at getting back on the other side of the fence
    c. Bill said that there is not much movement in the winter, but when snow removal operations take place, the location of the fence will be critical. Depending on how close the fence is to the road, plowing operations could pile snow next to and around the fence, allowing animals to get over it.
        i. He added that the project may not need a 6-8 foot tall concrete wall, but maybe a concrete barrier with 4 foot fence on top of it would be sufficient
    d. Craig added there is good research on high tensile strength fence that may work on top of a barrier.
    e. Julia said that WASHDOT did a study on fence in high snowfall areas that Project Team can refer to
    f. John replied that the maintenance of the fence will be an issue and the Project Team will need to consider it. There is also snowcat operations that take place, so working with CDOT Maintenance on developing this solution will be critical
3. Greg added that glare screen on the median barrier can be an issue as small animals can't get over it
    a. Martha replied that there is a safety issue with glare and glare screen could be strategically placed in areas to significantly improve safety on sections of West Vail Pass. This will need to be done in comparison with animal crossings
    b. Bill added that the glare screen in Dowd that has segments of shorter heights that allow for animals to get over the barrier and he feels those have been successful

c. John stated that a recent CDOT safety assessment for the Dowd Junction area showed there was a 30% decrease in crashes from installation of new pavement and the taller glare screen

d. Bill said that fencing and culverts underneath the roadway to keep animals from getting onto interstate while still allowing passage underneath is important. If installed properly, glare screen wouldn't be as much of an issue

4. John highlighted the recommendation for MM 186.5 which was to construct a wildlife underpass, and at MM 187.4 which was to construct a wildlife overpass

    a. Don asked if there was an official rule for implementation of recommendations from the 2011 report (i.e. "must a crossing be put in?) as there are different recommendations from different LIZs and other subsequent wildlife reports

        i. David S stated that for this project, as it is a Tier 2 of the I-70 Mountain Corridor PEIS, the ALIVE MOU will require the project to take a hard look at these 2011 LIZ recommendations. Projects should run those recommendations through Core Values and Success Factors to see if they are good for the overall benefit of the project

        ii. Greg asked if the MM 187.4 location was where the ARC design competition was for several years ago. The ITF group replied that it was the location.

        iii. Bill added that a previous recommendation to install an overpass at MM 188 gave guidance that the location could be +/- ½ mile from that mile marker. MM 188 was selected because 2 lynx were hit there, but the recommendation allowed for flexibility to select the best location that could be built the cheapest. The ARC competition selected the MM 187.4 location for the completion as it was best location for a structure for wildlife that had a projected cheaper cost.

    b. John said that while there are these recommendations for an overpass and underpass structure, the animal crash data is lowest in this area. He asked how the crash data could support either of the recommended structures.

        i. Bill replied that for 7-8 months of the year it is winter on the upper half of the pass and that deer & elk won't cross in this area during winter conditions, so that could be a big cause of the low crash data. For Threatened and Endangered species, the question is how many need to be killed on the highway before its

worth installing one of the recommended structures, especially when the state is trying to restart a lynx population

ii. Kara asked when lynx hits happened

1. Paige replied that the first was in July of 1999 and the other one was in May of 2004

c. John asked if an overpass would be for smaller animals too or if its needed only for bigger animals

i. Bill thought that any money spent on a structure should be for greatest amount of animals and not restricted to size

ii. Craig said that he thought animals will use it if it is build. As the interstate is a barrier, they don't cross and don't get hit (as the data shows), but an overpass would provide the ability to cross. Animal populations are rapidly declining and the cost of an overpass is expensive, but all this needs to be considered

iii. Bill added that there aren't a lot of crossing locations along the entire I-70 mountain corridor for wildlife, so a major crossing here could be a huge benefit

d. John asked if animals would cross over a structure on a day to day basis or if it would be more for migration

i. Bill surmised it would be more seasonal for migration

ii. Julia said that the upper half of the pass is summer range and agreed that movement would be seasonal

e. Jen said that there is a Forest Plan document that states additional highway crossings are recommended when highway improvements are made

i. ***Jen will send this document to the Project Team***

f. Bill said that there needs to be some sort of structure on upper part of pass for animals to cross over. It doesn't necessarily need to be an overpass or on the West side of Vail Pass, but something is needed

g. Greg asked if a shed for snow/rock/avalanches that is designed in combination with an animal overpass could be considered. The group discussed the feasibility of this briefly

h. Julia said that while the crash data is low, the upper section of interstate is a huge barrier. This location is different than State Highway 9 as animals don't cross the interstate every day but more in migratory patterns. The West Vail Pass corridor should be looked at uniquely as wildlife numbers

will be much lower than other areas of the state, but there is significant ecological value to adding permeability on the upper half of pass

i. John responded that the Purpose & Need of this project is for safety and traffic operations, but the ALIVE MOU notes that CDOT needs to go above and beyond to address wildlife permeability.

i. John asked the ITF if they felt an overpass or underpass would be better

i. Julia replied that it depends on how long and wide the overpass would be, and that it might be more expensive to do an underpass. The goal should be to get multiple species across a structure and not just target one kind

1. Don added that the topography of the upper half of the pass doesn't lend itself to an underpass
2. John said the Project Team hasn't studied whether a certain option would be better and is only gathering information today

ii. Alison said that the goal was to get lynx across the interstate when this effort initially started for an overpass. There is not much data that shows lynx will use an underpass, so an overpass would be better

1. David S asked what adding a 3rd lane would do to lynx and if that would further the need for an overpass
2. Alison responded that it already is a barrier and a Section 7 process should look at if improvements of lynx movements across the highway can be made
3. Kara added that whatever alternative is picked, the permeability will need to be considered
4. Greg added that the PEIS requires this evaluation
5. Paige said West Vail Pass is one of the higher priorities for lynx (#2 statewide) for the Lynx in Lieu Fee Priority List (an advanced mitigation program)

a. David S informed the group that this list exists to take the impacts to lynx from several small projects across the

state and mitigate in one location. West Vail Pass is the second highest priority as a location for this larger mitigation

j. Bill stated that when a 3rd lane is added in both directions, the path that an animal needs to cross is much longer and barrier effect will be even worse.

i. He was not sure if the solution has to be an overpass as that may not work on the pass, but maybe an underpass works better. The Project Team should really evaluate the best solution and not have a predetermined answer

5. Martha asked about the 2013 recommendation to build an overpass on the East Side of Vail Pass and how that works with this potential West Vail Pass location

a. Bill said he's not sure CDOT would need 2 overpasses

b. Julia said the next LIZ study wanted an overpass on the east side of Vail Pass, but that was a separate LIZ and a separate recommendation. For West Vail Pass, an overpass is challenging and human activity in the West Vail Pass recreation area has increased (impacting lynx habitat), so more animals may be moving on the east side of the pass. There is still a lot of value on the west side, but it might be that shifts in movement require one on the east side. She added that a past geotechnical survey in 2009 didn't find bedrock at the MM 187.4 location which could be a challenge for building an overpass

c. Martha asked if the ARC competition moved their location to the east side of the pass.

i. Julia responded that it did not, but Rocky Mountain Wild in conjunction with CDOT Region 1 looked at this topic and recommended the east side as the first location of an overpass

ii. Bill said that the east side overpass may be challenging as Copper Mountain wants to expand and encroach towards the area where the overpass is recommended. West Vail Pass has recreation though that impacts wildlife herds

iii. John added that while bedrock wasn't found, that doesn't mean the project couldn't build a bridge, but that it would be more challenging. He also stated that the geotechnical drilling found remnants of an ancient glacier at the MM 187.4 location.

d. John said the report from 2013 ruled out the MM 187.4 crossing as the east side crossing was the most effective location for an overpass.

i. David said that this report was to identify wildlife enhancements that could be go through Tier 2 process on its own (i.e. not with another larger project), but it didn't preclude or eliminate other recommendations from past LIZs.

6. John asked if an underpass that snowplows could drive through in winter would be acceptable (i.e. animals would cross under during summer)

a. Julia said fox and coyote would need it for winter use.

b. Bill said the box would need to be big enough to have an asphalt substrate and a dirt substrate. It couldn't only be a paved bottom as animals wouldn't want to use it. Very few animals would use it in the winter (fox, coyote, lynx, pine martin). It would be better than no mitigation, but not the most desirable

c. Julia asked if the maintenance underpass at Straight Creek was used year round and if the one on West Vail Pass would then have a maintenance seasonal restriction

i. The ITF group discussed this could be a challenge

d. Jen said if a box comes close to the bike path, recreation users could be explore it and make user-created trails

i. Greg added that there are sections of the bike path that will need to be rebuilt, so this ALIVE ITF could provide good insight on a potential location

iv. John then presented the aquatic recommendations in the LIZ reports

1. The recommendation for the culvert at MM 180 said to keep this location as a fish barrier. CDOT has recently completed a project (with CPW input) to line this culvert and keep it as barrier

2. The recommendation for the MM 180.6 location was to replace the existing culvert with a 3 sided box

a. John said this was rebuilt in an Emergency Repair project but it still could be fish barrier

b. Bill said he was not too worried about fish, he would spend money on the upper part of the pass rather than on the lower half

c. Julia said work was done with CPW to look at aquatic resources and provide recommendations, but it wasn't a huge priority to improve aquatic passage. Many of the other recommendations are to maintain the creeks at the existing bridges

d. The ITF group agreed that the MM 180.6 location wouldn't need improvements

3. The recommendation for the MM 183 location was to remove the existing culvert
    a. The ITF group discussed where this location was and the conditions of the culver. It was decided that further investigation will be needed on it
        i. Julia added it will probably be a low priority. She added that these recommendations show where known fish barriers are and whether they should remain or be removed
    b. The group then discussed that some of this discussion can be deferred to the SWEEP meeting. The ALIVE MOU does talk about aquatic recommendations, but this will be discussed again at the upcoming SWEEP ITF meeting
4. The recommendation for the MM 183.3 location was to improve fish passage
    a. Bill said the Project Team needs to look at this and see if there are fisheries upstream and if it is really needed
5. The group decided to not discuss more of the recommendations and then focus more on it at the SWEEP ITF

b. **Design Options**

i. Kara stated that the previous 4 TT meetings talked about design options that will lead into alternative developments and highlighted what was discussed at those TT meetings

ii. Don covered some details on the content that was discussed at the TT meetings including roadway template, construction phasing options, and trail options

1. The bridges may need to be replaced on realignments of the interstate, the trail may need to be relocated where impacted (especially on the upper ½ of West Vail Pass), and roadway widening widths have been discussed
2. The Project Team is developing criteria from the TT & ITF meetings to screen the alternatives that are developed
3. Bill asked what the definition of "near the creek" is for trail relocation
    a. The Project Team didn't know at this point in the project. Kara said this was a higher level discussion at a TT meeting and the exact distance to the riparian area was not discussed
4. David S asked if wildlife had an impact on any of the options
    a. Don said the use of old US 6 as a detour considered this as many of the crossings would be eliminated as no bridges

would be needed to install this detour. This design option was eliminated for 4f recreation issues too.

b. Martha said the Project Team's challenge is to take input from all of the stakeholders and come up with the recommended alternative that best fits all of the input received so far

11. Schedule and Next Steps

a. Kara covered the project schedule. The project is currently developing Purpose & Need criteria for the Level 1 screening, then will further develop that criteria for the Level 2 screening. The Project Team will come back to the ALIVE ITF during the Level 2 screening process

   i. She added that the next ALIVE ITF presentation will show the results of the Level 1 screening and what alternatives moved onto the Level 2 screening. This will be done before the recommended preferred alternative is identified

   ii. John asked group if the ITFs will be before the Level 2 analysis or as that second level screening is taking place. He wanted clarification as the goal is to have only one more ALIVE ITF meeting before the recommended alternative is identified

      1. Bill said this topic is too complicated and that one meeting may not be enough to fully discuss the mitigation

         a. John said he hoped it could be done in one meeting and may need to be looked at and addressed as the project progresses

b. Greg added that there is a potential for noise walls in East Vail and asked how that impacts wildlife

   i. Bill replied that a noise wall would prevent crossings and could be tied to the wildlife fence for a continuous barrier and push animals underneath the bridges

c. Bill stated that he felt it would be counterproductive to get the bike path too close to the stream as it could add impacts and sediment to Black Gore Creek. The pedestrian bridges could narrow the creek and allow for beavers to dam them up and create big issues. He felt the design should stay well out of riparian areas and try not to cross the creek. Impacting riparian areas could go against some of the Core Values of the project

   i. Greg said that there are pros and cons to moving the path closer to creek. It could help to clean sediment out of creek and provide a better user experience, but it would impact the riparian area and potentially increase winter activity next to creek as well as affect emergency response for incidents on trial. There is a lot to be considered in looking at trial realignments

   ii. Jen said that the Forest plan has guidance on permanent trails in lynx habitat

      1. ***Jen will send this to Project Team***

iii. Julia said that in other areas in Colorado, trails are closed in the winter due to the lynx habitat and asked if this could be done for the Vail Pass trail

1. Jen replied that it is feasible and the Forest Service would be able to enact this as they manage recreation use of the trail

MEETING NOTES

PROJECT:	21685 I-70 West Vail Pass Auxiliary Lanes
PURPOSE:	SWEEP Issue Task Force (ITF) Meeting #1
DATE HELD:	May 16, 2018
LOCATION:	CDOT Gypsum Maintenance Yard, 10519 Highway 6, Gypsum, CO
ATTENDING:	Joel Barnett, FHWA John Kronholm, Project Manager, CDOT Region 3 Karen Berdoulay, Resident Engineer, CDOT Region 3 David Cesark, Environmental Manager, CDOT Region 3 Jennifer Klaetsch, Environmental Unit, CDOT Region 3 Paula Durkin, Environmental Unit, CDOT Region 3 Becky Pierce, Statewide Wetlands Program Manager CDOT Matt Klein, Realty Specialist US Forest Service Matt Grove, Fish Biologist US Forest Service Andy Herb, Alpine Eco Siri Roman, Eagle River Water & Sanitation District Bill Andree, Colorado Parks & Wildlife Caroline Byus, Leonard Rice Engineers, on behalf of Eagle River Water & Sanitation District Lisa Lloyd, EPA Seth Mason, Leonard Rice Engineers, on behalf of Eagle River Water & Sanitation District Pete Wadden, Town of Vail Bob Weaver, Leonard Rice Engineers, on behalf of Eagle River Water & Sanitation District Taylor Elm, Colorado Parks & Wildlife Don Connors, Consultant Project Manager, Wood John Loranger, Wood Kara Swanson, Consultant Environmental Task Lead, David Evans and Associates Matt Figgs, CDOT Region 3
COPIES:	Attendees

SUMMARY OF DISCUSSION:

(Please Note: Action items are shown In ***bold italics***.)

1. **Introductions & Agenda**

    a. John Kronholm did introductions, covered the agenda, and talked briefly about the purpose of today's meeting, which is to provide SWEEP (Stream and Wetland Ecological Enhancement Program) Issue Task Force (ITF) members with an understanding of the project to-date, gather feedback on existing conditions and the current Black Gore Creek Sediment Control Action Plan (SCAP), and to gather input on mitigation and protection opportunities.

2. **Project Background and Overview**
    a. John K discussed the background of the project including highlighting the I-70 Mountain Corridor Programmatic Environmental Impact Statement (PEIS), the recommendations from the PEIS (including stipulations in the SWEEP Memorandum of Understanding [MOU]), the Tier 2 NEPA process, and the past 2007 Environmental Assessment (EA) for the West Vail Pass area
        i. He explained that this project is the Tier 2 NEPA process as it addresses site specific details for West Vail Pass, alignments, costs, and potential mitigation measures
        ii. He also highlighted that the 2007 EA focused solely on safety, which the current Purpose & Need focuses on both safety and traffic operations.
3. **CSS Process/ITF Responsibilities**
    a. John K outlined the Context Sensitive Solutions (CSS) process that the Project Team is following for this project and what stage the project is at in the process
        i. The Project Team has gathered information from the Technical Team (TT) that is being considered for the development of alternatives that will then be screened through a two-level screening process
        ii. He also highlighted the Core Values that the Project Team, in conjunction with the Project Leadership Team (PLT) and TT, have developed.
        iii. Kara pointed the ITF group to the handout which included more details on the Core Values as well as the Success Factors.
    b. John K covered the roles and responsibilities of the various ITF groups which come directly from CDOT's CSS guidance.
        i. He explained that the intent of an ITF is to focus on a specific issue and make recommendations back to the Project Team and TT.
4. **Current Project**
    a. John K discussed the limits of the West Vail Pass Auxiliary Lanes project (Mile Marker [MM] 180 to 190) and talked to some of the unique characteristics along the corridor.
        i. The elevation of West Vail Pass summits at 10,603 feet
        ii. There are several sections of steep grades which are at 7 to 7.4%
        iii. There are areas of substandard roadway geometry with some compound curves that were designed for a 55 mph speed limit (the current speed limit is 65 mph).
        iv. There are 23 different retaining walls totaling 23,515 linear feet
        v. There are 16 bridges that make up 1.6 miles of the corridor
        vi. The Vail Pass/Tenmile Canyon National Recreation Trail sits in the corridor. This paved bike trail gets 39,000 annual users with a peak daily count of 3,500 users

vii. West Vail Pass is the access point for the Vail Pass Winter Recreation area which saw 56,000 users in the 2016/17 winter season

viii. There are numerous wetlands and waters of the US in or near the corridor including Black Gore Creek. There is also considerable wildlife activity in the lower five miles of the corridor.

ix. There is a Sediment Control Action Plan for Black Gore Creek that another ITF will discuss implementing

x. The West Vail Pass corridor is subject to Section 106 of the National Historic Preservation Act as it is a nationally and exceptionally significant feature of the federal interstate system. West Vail Pass was one of the first highways to purposefully sculpt cut-and-fill slopes to fit in its unique setting, as well as being one of the first to use precast and cast-in-place segmental bridges.

xi. 80% of the project is within the White River National Forest

xii. 20% of the project runs through the residential portion of east Vail

xiii. The weather on the west side of the pass is a challenge as this side routinely sees more snow than the east side of the pass

b. John K then covered the Purpose & Need of the project which is to improve the safety and traffic operations for both eastbound (EB) & westbound (WB) directions of West Vail Pass

i. He highlighted several specific safety and traffic operations issues that exist on the pass that have necessitated this project

ii. Siri asked if there is an economic impact that has been determined for closures on I-70

1. David replied that CDOT is using $1 Million per hour of economic impact when I-70 is closed.

2. John K stated that the original amount CDOT had used historically ($800,000/hour of closure) was based on when mountain resorts were open. More work has gone into trying to determine an overall number that includes impacts to freight, drivers, and other businesses.

3. Don added that there was over 200 hours of closure on Vail Pass over the past three years.

4. Joel asked if all of those closures were during hours when resorts were open.

a. John K replied that CDOT hasn't determined that yet. More work could go into determining an exact economic impact closures on West Vail Pass has if it is deemed necessary.

c. John K then talked about the Level of Service of Safety (LOSS), which compares West Vail Pass to all rural, mountainous 4-lane divided highways. The safety assessment that was completed for this project showed that every section of West Vail Pass has a moderate to high potential for crash reduction. Improvements made to the

corridor have the potential to significantly reduce crashes on the interstate as this section of highway is significantly worse that other similar sections.

i. John K highlighted that I-70 on West Vail Pass sees about 22,000 vehicles per day

ii. Joel asked how many miles of 4-lane divided highway were used statewide for a comparison.

1. John K stated that it is all 4-lane divided highways in the state, but isn't sure how many miles that is.

2. Joel then asked how many of those miles are above 9,000 feet in elevation.

3. ***John K stated the Project Team can look at these requests and determine those numbers.***

5. SWEEP MOU and Implementation Matrix Review

a. Becky presented on a brief history on the SWEEP effort which began in 2001. She added that she was one of the authors of the SWEEP MOU.

i. She stated that SWEEP is a program developed out of the PEIS to avoid or minimize environmental issues

ii. The SWEEP effort included biologists, hydrologists, water quality experts, community representatives, and other potentially-affected parties. Three major drainages were covered in the entire PEIS corridor.

iii. The parties (signatories) to the SWEEP MOU are CDOT, Federal Highway Administration (FHWA), US Fish & Wildlife Service (USFWS), the Bureau of Land Management (BLM), Colorado Parks & Wildlife (CPW), the Forest Service (USFS), Clear Creek County, the Clear Creek Watershed Foundation, the Upper Clear Creek Watershed Association, and Colorado Trout Unlimited

1. US Army Corps of Engineers representatives, EPA, the Colorado Watershed Association, and the Eagle River Watershed Association were all part of the effort as well but did not sign the MOU.

b. Becky then talked about what is in the SWEEP MOU

i. It is an MOU that defined parties and their roles and responsibilities

ii. It identified and recommended appropriate mitigation strategies, applied to all parties (not just CDOT and FHWA) to allow all of the stakeholders to gather together and contribute to potential solutions on projects, and identified primary issues of concern (including water quality, natural habitat, and information)

1. She highlighted that not all of the issues in water quality in the overall SWEEP MOU may come up as they had to do with mining and mine tailings

2. Lisa asked for clarification on what the information gathering requirement in the MOU was about

a. Becky replied it was a big effort to gather information (mapping, best practices, etc.) to ensure future mistakes weren't made along the corridor.

iii. Becky then stated that there is an implementation matrix that outlines the 3 issues of concerns with associated inputs, considerations, and outcomes for each phase of a project

1. Kara referred the ITF group to one of the handouts which is a specific implementation matrix for this project

iv. John K asked if there was an expectation to come up with a new SCAP for Black Gore Creek as many of the existing water quality features may be wiped out with this project

1. Bob added that the SCAP was developed by a consultant to CDOT (Clear Creek Consultants), but that the SCAP was never fully implemented. It looked at sediment issues on the corridor (Zone 1), the problems that had occurred over time between the corridor & Black Gore Creek (Zone 2), and the impacts on Black Gore Creek (Zone 3). The SCAP only focused on sediment control on the interstate and had a recommended program of $20M, and would never be fully completed without a large I-70 project.
2. Eagle River Water & Sanitation District (ERWSD) and Eagle River Watershed Council did work to generate funds ($1M) to do interim improvements to Zones 2 & 3.
3. He added that the SCAP was a guide for these improvements, but was never finished. He stated that the sediment control and management strategy needs to be added in the planning/design of the project, not as an afterthought or as a later mitigation measure and encouraged the Project Team to address water quality issues that are problematic along I-70.

a. John K replied that the Project Team has the opportunity to make these improvements and will look at designing them into the roadway and not include them as an afterthought.

6. SWEEP Implementation Matrix Discussion

a. **Water Quality**

i. John L stated that his goal was to ask the group for input on if the SCAP's recommendations met the objectives that were originally determined, what the costs and benefits were for each strategy, and what revisions may need to be added in the SCAP

ii. **Sediment – Black Gore Creek SCAP**

1. John L presented some background on the development on the Black Gore Creek SCAP and talked about some of the proposed recommendations that came out of the SCAP (4 implementation scenarios)

2. He covered the 4 implementation scenarios that came out of the SCAP
    a. The Baseline-Existing Maintenance Program which basically maintained the amount of sediment removal that took place on the pass
    b. The Enhanced Maintenance Program which did not add any new control structures, but added $500k annually to enhance sediment removal
    c. The Large Capital Construction & Enhanced Maintenance Program which included all of the elements of scenario #2 plus $20M in capital improvement projects for sediment control structures
    d. The Prioritized Capital Construction & Enhanced Maintenance Program which included all of the elements of scenario #2 plus $4M in annual capital improvements
3. John L talked about a few of the projects that had been completed since the completion of the SCAP. 67 permanent BMPs have been constructed since the 2002 implementation of the SCAP. He stated the Project Team will continue to look at what has been completed and what remaining items are not implemented.
    a. He also added that CDOT has increased its annual maintenance budget by about $250k per year

iii. **303(d) Listing**

1. John L added that Black Gore Creek is listed under Section 303(d) of the Clean Water Act
    a. Matt Grove added that Black Gore Creek is not listed for macroinvertebrates but it is monitored
    b. Caroline added that one portion of Black Gore Creek is still listed as 303(d) for macroinvertebrates (the upper portion)
    c. Matt G added that he didn't believe it was listed but is still on the M&E list. Siri added that the M&E list is still very important.
    d. Karen asked for clarification for what the M&E list was
        i. Matt G replied that it is a classification that isn't bad enough to be listed on 303(d), but does have pollutant concerns and is therefore monitored

iv. Kara asked if there were any other questions for mitigation or implementation that needed to be covered by the ITF

1. Bill stated that some of the discussions surrounding the original SCAP was to add concrete barrier and additional paving to trap sediment and give a location for sediment to be cleaned, but this installation could be a barrier to wildlife trying to cross the

interstate. He added that the location of the sediment ponds is important too as those can attract wildlife. If they are on the interstate side of a wildlife fence, could draw animals to I-70

   a. John K added that CDOT Maintenance needs to weigh in on those locations and how easy they will be to access and clean
   b. John L stated the Project Team can work with the ITF group during design to makes sure these different concerns are all balanced and considered

2. Siri stated that CDOT Maintenance manages snow much differently than how it was done in 2002 when the SCAP was completed. The Project Team should look at how it is operated now and update the recommendations of the old SCAP
3. Seth asked if it is worth working with CDOT Maintenance to look at the operational recommendations in the SCAP and add onto those old recommendations with new practices and new technologies
   a. John L agreed that there is an opportunity to do this
   b. John M added that CDOT Maintenance uses technology in their application of product on the roads, so there is some opportunity to look at this. Maintenance doesn't want to waste material under their new practices
   c. John L stated that the Project Team is still in early development of work on this issue and will reach out to the ITF members as questions arise
4. Siri added that in her perspective, on the scale of a $500M project, spending money to update the SCAP within the limits of the project is very worth it as a whole new look should be given to the corridor
   a. Bob concurred with this recommendation
   b. Jen also concurred as just an update to the 2002 SCAP would not be relevant with a large change to the corridor as part of this project. She added that Maintenance will need to be at the table for this effort
5. Seth asked for the timeline for construction of this project
   a. John K replied that there is no identified construction funding at this time, only money for EA effort. The EA is expected to be completed in early 2020. The project is on a potential ballot measure list for $225M which would allow the project to move into design and some phase of construction in a few years.
   b. Seth asked that if there is significant uncertainty on when or if this project gets done, would be worth just an update to the SCAP and not re-doing it. If there is a high chance it will be constructed in the next 5-10 years, it would be best to do a new SCAP now

   c. Karen added that if the Project Team gets design funds to get to FIR (CDOT's 30% design level), it would makes sense to do a new SCAP, even if construction funding isn't identified yet. CDOT has identified this project as one of the top 5 projects in the state. Several potential funding scenarios exist that will continue to develop in the upcoming future.

6. Bob asked how the identification of the alternative for this project works with the Tier 1 PEIS as it has already identified a 3rd lane
   a. Karen replied that the TT is working through this question right now and whether there are multiple alternatives or if there are only design options for 1 alternative (adding a 3rd lane). The Project Team and FHWA are working closely to develop this. She added that the Project Team hasn't looked at the level of effort for generating new reports (such as a new SCAP) but is looking to the ITF groups for guidance
7. Siri added that a new water quality management plan needs to be generated for the whole corridor including the Black Lakes and not just Black Gore Creek
   a. Bob stated that certain areas on the corridor were difficult to determine how to install mitigation measures that could be maintained, so the alternatives for sediment control were limited by the footprint of the highway. The strategy for managing sediment and keeping it from leaving the roadway should be looked at as alternatives are developed so that the same issue doesn't arise with a new footprint.
      i. Karen replied that the Project Team is looking at screening criteria for sediment control and maintenance, so all of the Core Values will be considered as alternatives are scored.
      ii. John K added that there may be opportunities to improve maintenance access as the alternatives and design progress for this project. They can be determined in conjunction with design and not installed as an afterthought
      iii. Karen highlighted the schedule the Project Team handed out to the ITF group. The refinement of the preferred recommended alternative would be the time the Project Team starts to dive into the details of looking at specific improvements and will look to the ITF for guidance on these.
8. Bob asked what the Level 1 screening will cover
   a. Kara stated that the Project Team is still determining the alternatives right now that will be screened, but the Level 1 criteria will be applied to the alternatives. Design options

will also be determined later and compared to the Core Values

b. John stated that once the preferred alternative is identified, the mitigation measures will be looked at through the different ITF groups

c. Bob asked if the impacts for each alternatives would be the same or not

i. Kara replied that not necessarily, it depends on what alternatives come out and are screened

d. Siri asked if an alternative to focus on fixing geometry and widening shoulders while keeping I-70 as a 4-lane interstate could be its own alternative

i. Karen replied it could be an option. The Project Team is discussing whether to approach this in light of the PEIS as the TIER 1 decision recommended adding the 3rd lane. The Project Team is looking at whether going back and changing the recommended improvement from the PEIS should be considered as an alternative as this is a Tier 2 decision to the PEIS's Record of Decision. This could also be a standalone phase of a larger project

ii. Siri asked for clarification on the difference between the Tier 1 and Tier 2 effort

iii. Joel stated that the Tier 1 effort defined a recommended suite of improvements for the I-70 Mountain Corridor. Tier 2 projects would be built upon that and may not implement the Tier 1 decision, but those projects can't preclude the Tier 1 decision

iv. Lisa stated the Project Team could segment the project to have different solutions in different areas to try and minimize impacts

9. Seth asked what the SWEEP ITF will help the Project Team accomplish with this meeting today

a. Kara stated that the intent of this meeting is to provide the SWEEP ITF group with the project background and then gather information to consider in moving forward with the project

b. **Natural Habitat**

i. **Wetlands Protection**

1. Andy talked about the wetlands work the Project Team is planning on accomplishing as a part of the project. The Project Team is working with the CDOT Region 3 Environmental unit, the Colorado Natural Heritage Program (which completed general wetland and

fen mapping within 500 feet of the edge of interstate, but not outside of the Right-Of-Way), Colorado Parks and Wildlife, as well as using the data set from PEIS. He asked the ITF group for more data or information they may have that was not listed.

   a. He explained the work completed by the Project Team to date as well as the identified work that will take place in the future. Field work will start this July to map wetlands. That mapping will be done both by field work and by aerial mapping. The Project Team will be conservative in its look and will include more areas in the mapping limits than potentially needed. When permits need to be pulled for design and construction in the future, those limits will then be further refined.

   b. Fens will also be mapped and more closely examined.

2. Andy then presented some of the wetlands criteria on the implementation matrix that the Project Team will be attempting to answer

   a. He stated whether the project is subject to the US Army Corps of Engineers Merger Agreement is still being determined. Although the US Army Corp of Engineers was not at this SWEEP ITF, the Project Team is still working with them

   b. Lisa stated that in light of the Trump Administration's effort to streamline the NEPA process, she recommends that all of the information needed for a permit or for the merger agreement should be complied so the Project Team doesn't have to go back and re-do work. Involve the US Army Corps of Engineers early on so their requirements don't impact the selection of the preferred alternative

      i. Andy added that the US Army Corps of Engineers' and NEPA's definition of environment is different, so the Project Team will make sure they are included

   c. Becky added that the US Army Corp of Engineers doesn't decided whether the project will enter into a merger agreement; it will be FHWA (with concurrence of CDOT). The merger agreement is being re-written right now after EPA and the US Fish & Wildlife Service conduct a final review. She stated that other state DOTs use the merger agreement much more than CDOT does, but CDOT should look at using it more, especially when there is more than one alternative or one alternative with many design options. It will prevent the Project Team from having to back track

      i. Andy added that depending on the alternative, a permit may not even be needed.

ii. Kara added that further conversations will be needed to determine the potential future permit strategy for this project

iii. Andy said the Project Team is taking the conservative approach by assuming an individual permit is needed right now and can always not go down that route if it is determined that the permit is not needed.

1. The goal of the Project Team would be to avoid wetlands first, minimize impacts second, then mitigate lastly. He added that the ITF group could provide the Project Team data on wetland sites that have been degraded and could be restored as part of this project

d. Matt G asked if the Project Team's survey will include any potential realignment of the bike path

i. Andy replied that yes it will

ii. Kara added that the original study limits may not go down all the way to the creek, so if any design options impact areas outside of the original limits, the Project Team will need to go back out to re-map

e. Paula stated that there are many areas below Black Lakes that have a lot of sediment in that should be looked at. These could be good potential mitigation areas for the project

i. Bill asked how that could be considered mitigation as that is fixing an old problem from the original construction of the interstate

3. Bob asked if this project will require an amendment to the Highway Easement Deed FHWA has with the Forest Service

a. Karen added the Project Team doesn't know at this time.

b. Don added the road probably will stay inside boundaries of easement, but bike path may not.

c. Bob wanted the Project Team to look at whether the highway was in a Special Use Permit or in an easement

i. ***The Project Team will confirm whether I-70 sits in an easement or under a Special Use Permit***

ii. **Aquatic Special Status Species**

1. Matt G talked about the list of Threatened & Endangered aquatic species the Forest Service has identified as a potential to be in the project limits

a. He added that the Greenback Cutthroat Trout doesn't exist in the Black Gore Creek watershed (the Greenback in the creek is not a genetically pure species)

2. Kara showed the questions from the implementation matrix that the Project Team will work through
    a. Matt G spoke to some potential outcomes
        i. This project is not a good candidate for enhancing the recovery effort, but the Team will work with CPW
        ii. Fish barriers do exist and could be looked at for enhancement or removals if necessary
        iii. Black Gore Creek primarily is full of non-native fish species or brook trout
    b. Bill added that there are fish barriers for Pitkin and Booth Creeks, but CPW would potentially look at sites of future recovery and would like to keep the barriers in place
3. Andy presented the recommendations for the aquatic connectivity that were originally established in the ALIVE Linkage Interference Zone (LIZ) report. These recommendations are site specific along the corridor and were discussed among the ITF group.
    a. Matt G stated that any work that has to do with fish passage has to go through the Forest Service's hydrologist for 100-year flood elevations
    b. Bill added that CPW wouldn't want to remove any barriers (even ones that exist naturally) as it is tougher to put one in than it is to later pull one out. This would allow for sections of creek to do future habitat recovery efforts
4. Bill stated that the unknown tributary at MM 183 may be Timber Creek
    a. John K hasn't found this location in the field and isn't sure why CDOT would install a culvert for the creek underneath a bridge
    b. Matt G stated this may not be Timber Creek (as it shows up later on the list); it could be part of the sediment basin
    c. ***John K will try to find this location and send pictures to members of SWEEP ITF for their review on the ALIVE recommendation***

iii. **Aquatic Species Recreation**

1. Kara talked about the question on the implementation matrix for recreation regarding aquatic species
    a. Bill stated that the Gold Medal Water designation is below the project limits, so the project wouldn't have a special designation segment within the limits

2. Bob asked how the use of Black Lakes for fishing applies to this matrix (as ERWSD does a lot of stocking of those lakes via agreement with the Department of Natural Resources & CPW). He stated that the accumulation of sediment in those lakes has been problematic over time and remains an issue of concern. The sediment control measures that are implemented with the project should include protection of Black Lakes too
3. Bill added that restoring vehicle access to Black Lakes #2 would be beneficial as well to provide more recreation access
    a. John K stated that this may be an issue between CPW and the USFS & ERWSD and may not be a part of this project. This project will only mitigate those recreational facilities that are impacted and not provide additional access or parking

c. **Information (Research Needs)**

i. Kara showed the questions from the implementation matrix for this category that the Project Team will need to answer

1. Seth asked why the first question is limited to aquatic vegetation
    a. Andy replied that this probably relates to wetland vegetation
    b. Matt G added that there is a lot of data on macroinvertebrates and fisheries, so missing areas would include vegetation
    c. Andy asked if anyone in group had data on magnesium chloride and sand impacts on aquatic vegetation
        i. Seth replied there is research from CU on this that the Project Team may be able to obtain
2. Matt G said that there is not much published literature on the effect of mag-chloride on aquatic bugs. This should be considered as CDOT has been using more mag-chloride and less sand without knowing the effects on aquatic life. The Forest Service has seen a slight decrease in bug populations over the past 5 years. Abandoning sand because of sediment issues may not be the best solution because of the potential effects of the mag-chloride
    a. Seth added there is an effort with Eagle River Watershed to answer the second question right now. He recommended the Project Team to go back to Clear Creek Consultants to get the data that was generated with the original studies and asked if it could be shared with ERWSD
    b. Bob added that he felt CDOT collected data on monitoring requirements for Black Gore Creek in addition to what Clear Creek Consultants did
    c. Jen added that monitoring is ongoing but nothing additional outside MS4 areas is taking place and Black Gore Creek is not designated as MS4

d. Bob stated that the ERWSD collects macroinvertebrates and water chemistry data above mouth of Black Gore Creek and on Main Gore Creek and has seen that macroinvertebrates scores are significantly lower in Black Gore Creek than at those other locations. He feels the reason for those lower scores is due to lower bug densities from sediment impacts and mag-chloride. He can share the data with the Project Team.

i. Siri stated that there is a Black Gore Creek steering committee that is looking at starting to sample bugs

ii. Bob said he would greatly appreciate the opportunity to review the data that is used to establish the baseline criteria of the health of Black Gore Creek.

3. Seth asked how the Project Team will answer the matrix implementation questions

a. Kara replied that the questions were for entire I-70 Mountain Corridor. The Project Team needs to ask if the particular questions are applicable first, and then if they are, is there an opportunity to gather data to answer the question

b. Seth added that there is an opportunity to coordinate with other groups that are asking similar questions

c. Andy said that there is a good opportunity for data sharing with this project

d. Kara added there are some concurrent efforts that members of ITF can work together on

e. Siri stated that it may be good to have a member of the Project Team present at the Black Gore Creek steering committee

f. ***SWEEP ITF Members agreed to share data/information as it is collected***

d. **Design Options**

i. John K stated that the bike path design options are complicated with all of the pros and cons to weigh with user experience, safety, aquatic/riparian impacts, wildlife impacts, etc.

1. The Project Team would like to do another ITF specific to the bike path and have varying stakeholders provide input on where this relocated path could go. The Project Team will set this up at a later date and reach out to the necessary stakeholders

ii. Don talked about several design options that the Project Team has talked through with the TT including the roadway template width, construction phasing, and trail relocation options

7. Schedule and Next Steps

a. John K presented the overall EA schedule. He highlighted the EA is expected to be completed in early 2020, the preferred recommended alternative will be identified in the fall of 2018, and alternative refinements and environmental reports will take place from fall 2018 to mid-2019.

   i. If design funds are obtained by CDOT, an effort towards FIR will be taken, but the project can't progress past FIR until the EA is signed.

   ii. Kara added that the Project Team will come back to this ITF group in the early fall after the preferred recommended alternative is identified.

   iii. Karen stated that as part of the EA process, the commitment to re-do the SCAP could be agreed upon, but that would need to take place after the recommended alternative is identified. She doesn't feel the work needs to take place right now, but the Project Team could commit to doing it

      1. Bob asked when the Project Team would start doing more detailed design work

         a. Karen replied design funding is needed first, but that it wouldn't start until early 2019 at the earliest

      2. Bob asked what level of design is done when the preferred alternative is recommended

         a. Karen replied it would be very high level (i.e. 5-10%). She added the Project Team will make sure to have the right timing for redoing the SCAP to make sure it makes sense

         b. John K added the limits of disturbance for design and construction need to be established with the EA, and the proposed mitigations will needed to be looked at as well

         c. Kara said the design is going to be an iterative process with the different ITF groups

b. Siri asked if some specific metrics for preserving or enhancing water quality as part of the project could be added to the Success Factors (this could also be done for other Core Values like safety, etc.). Stipulations could be added to the project that would require measurements in the future that if the metrics aren't met, it would trigger a set of required actions by CDOT

   i. Karen replied that she wasn't sure if CDOT had done this broader commitment on other projects and would want to look more into this.

   ii. Joel stated that he felt Success Factors don't measure 10 years down the road, but are meant to look at what is designed. It is not typically within the scope of work to tie future metrics to projects

   iii. Bob disagreed with this view as agencies like Forest Service & US Army Corp of Engineers often require follow up monitoring after large projects to make sure metrics have been met and then required follow up mitigation if those metrics aren't met

iv. Paula added it depends on the permit type and who writes EA. The Forest Service is not writing the EA for this project as in the examples given

v. Kara added that it is tricky when trying to determine this in an EA. The Project Team could commit to something like producing a new SCAP but not necessarily future metrics

vi. Joel felt that the Success Factors are for the CSS work on the EA, not a measure for after construction

vii. Bill responded that he felt this would go against the MOUs signed as part of the PEIS. If construction takes place and the stream gets worse, the SWEEP MOU wouldn't have been met

1. Joel felt that concern would be better identified in an MOU rather than in the Success Factors

viii. John K asked the group to table this discussion and allow the Project Team to look further into it and then discuss at next SWEEP ITF. He did ask for some specific measurements that could be considered to be included in some metric that CDOT would look into.

1. The group discussed that reading through the SWEEP MOU to see what is included in that document would help the ITF group determined potential measurements
2. ***Kara will send the SWEEP MOU to the ITF***

ix. Bob added Enhanced Environment is one of the Core Values and encouraged the Project Team the stand behind that Core Values

1. John K added he felt this effort would be part of the Success Factors, but would more likely be a part of a permit or an MOU

x. Matt G said that since the Forest Service isn't doing the NEPA, the EA process will be a bit different than the stipulations that they would typically outline. His hope is that the Project Team will put the effort to maintain or improve sediment removal efforts

1. If the efforts are not improved or maintained, he felt it may kick this EA to an EIS, but it doesn't appear the Project Team desires to go down that road.

xi. Kara said that when the design options are being reviewed, the Core Values will be used extensively in looking at the options

xii. Joel added that FHWA's expectation is that the NEPA and CSS process is strictly followed for this project. He felt that this is a good project and the process is being followed with good stakeholder involvement so far.

c. Karen thanked the group for their time and effort and contributions to today's meeting.

MEETING NOTES

PROJECT:	21685 I-70 West Vail Pass Auxiliary Lanes
PURPOSE:	CPW and USFS Meeting re: Wildlife
DATE HELD:	November 26, 2018
LOCATION:	CDOT Region 3, Eagle, CO
ATTENDING:	John Kronholm, Project Manager, CDOT Region 3 Karen Berdoulay, Resident Engineer, CDOT Region 3 David Cesark, Environmental Manager, CDOT Region 3 Cinnamon Levi-Flynn, Biologist, CDOT Region 3 Matt Klein, US Forest Service Jennifer Prusse, US Forest Service Taylor Elm, Colorado Parks & Wildlife Michelle Cowardin, Colorado Parks & Wildlife Jonathan Lowsky, Consultant Biologist, Colorado Wildlife Sciences Kara Swanson, Consultant Environmental Task Lead, David Evans and Associates
COPIES:	Attendees

Action items are shown in ***Bold Italics***

SUMMARY OF DISCUSSION:

1. **Introductions & Meeting Goal**
    a. John and Karen provided an overview of the goal of the meeting- we wanted to meet with CPW and USFS prior to the ALIVE meeting and have these details discussed so there are no surprises walking into the ALIVE meeting.
2. **Connectivity Recommendations**
    a. Jonathan provided an overview of the matrix. CDOT is recommending fencing throughout the corridor. Fencing can be a problem with separating populations but we believe that with improvements to existing structures and new structures that we're increasing permeability.
    b. Michelle C. stated that the fencing on SH 9 is horrible to keep up. Having to contact CDOT maintenance a lot. Biggest problems is with gates. She recommends talking to CDOT maintenance about gates- suggest lighter gates. Suggested to drive SH 9 with fencing over dry washes and sediment is built up. Maintenance is the biggest issue- suggest paying attention to these issues more, even if they're little. Gates were falling off in the first year. Would be helpful to know where we will have walls that can act as fencing- show a visual. Kremmling maintenance was not supportive of the project because they were brought in late. **ACTION- engage maintenance staff in the wildlife discussions.**
    c. Jonathan stated that the existing bridges are very well used, except 182. If you look at wildlife-vehicle collision data, there are far fewer records on the upper half of the corridor. Track surveys confirmed this as well. Not any real reason for ungulates to cross on the upper part. Even though there's greater permeability on the lower half, there's more of a need for fencing there. Michelle stated that there was a successful

lynx crossing at 189.9. She showed a map with lynx mortality, successful crossing, and proposed crossing locations. Jonathan stated that the 1999 lynx mortality occurred when there were heavier populations of lynx in the area. Lynx seek out places in their habitat right up near the road, which was used to help site the crossing locations. Alison M. agrees that the lynx have settled down a little.

d. Jonathan mentioned that crossings will also benefit martens and weasels. The track survey also showed skunks and weasels walking parallel to road. Only found two locations of coyotes where tracks went right toward pavement.

e. MP 182- Bridge very heavily used by people and dogs. Find a better way to regulated leash laws. Provide interpretive signage on dangers of dogs to wildlife. Saw a lot of wildlife usage. John asked if posting signage could be a partnership with Vail. Karen stated that CDOT would likely just need permission but CDOT can put the signs up.

f. MP 183- Carried forward 2011 recommendations. Potential issue with removing the culvert- it would be a tradeoff removing culvert bc you would be putting more sediment and mag chloride. Jonathan suggested keeping it covered and improve the culvert. Suggest adding structure to provide cover and adding woody vegetation and potentially a PVC pipe for smaller animals to use. Michelle thinks vegetation is a better idea than a pipe because a pipe has to be maintained. Suggested using a half pipe if CDOT wants to put in a pipe at all.

g. MP 186.5- recommended 12x24 arch. Based on the various data back to 2003 as well as contractibility limitations, we're recommending not putting one here but instead at 188.3. Also recommending at MP 186.9 to put in a mid-size animal crossing structure. Michelle asked if 4-foot was the largest we could go. Jonathan said it was based on Banff results. Michelle thinks if we can go larger everywhere we can, it'd be good. Would need to figure out how to shield crossings from snowpack. Previous recommendations called for oversized culverts every .5 mile. CDOT decided to actually recommend some larger structures in other places as it didn't make sense just to oversize every culvert. Making this one larger would be better given the spacing of other crossing locations.

h. Michelle stated that on SH 9 where culverts aren't tied in to the fencing, they become otter slides.

i. Michelle reiterated that larger underpasses are better. John said there are ways to minimize snow pack. This is what we'll hear at the ALIVE meeting.

j. MP 187.4 – looking at a larger underpass. Banff study was the first one that looked at adoption of the structures by different species. Elk were slower to adopt. Deer and mountain lions were early adopters. After about 4 years, elk would then use it.

k. Michelle stated that there is a 42' x 14' underpass on SH 9- elk still aren't using it after 3 years.

l. Michelle asked what the distance is on I-70 that the underpass would have to be. John stated that we can squeeze ours in at 150' long. Roadway section is 106'. To get outside of clear zone is additional 20-feet on either side. Michelle- Would recommend going higher than 10'- maybe at 14'. Suggested seeing what the largest is we can put in there. If it's 20x10, have our justification ready. This is our one shot for decades to do anything on this side. Michelle is okay without an overpass since

we aren't catering to elk; but we could have moose and if there are issues with snow; bigger is better.

m. Jonathan asked is hares are eating the veg on the overpass on SH 9. Michelle- yes, and deer are as well. There are a lot of hares are using the overpass.

n. Since it's summer range, deer and elk drop off during winter. Even if there's snowpack, smaller animals may still use it. But there's really no data on that.

o. Concrete box culvert- is there any literature on the diff between box vs. arch? Not too much.

p. Michelle also mentioned escape ramps- they can add up pretty quickly. One thing about concrete wingwalls is that they can be used as jump downs.

q. MP 187.8- another small to medium sized box or culvert. Any place where there is poor veg, we are also recommending planting additional cover for protection and comfort.

r. MP 188.3- siting is a combo of data we have. Michelle- again, make it as big as possible.

s. MP 188.7- good forested cover. Based on telemetry data there is good lynx habitat on either side.

t. Michelle asked if there is anything we can do closer to MPs 189 and 190. She wants CDOT to look at what we could do closer to 190. John stated that there is a lot of man-placed fill between 190 and 189.7 but that we may be able to place a 4-foot culvert. ***ACTION- CDOT will look at it and see if even a 4-foot diameter one would work.***

u. Michelle talked to Patty Kramer (PI on SH 9 crossing). Only issue with metal culverts is they can be loud when there is a median with an opening. Is an open-bottomed concrete structure better? On the noise issue- is a skylight bad because of noise? Yes and would have maintenance issues. Jonathan stated that the other thing we're looking at is to include a shelf in existing culverts to allow small animals to cross that don't like walking in water.

v. Jonathan said that CDOT will also look at adding features to bridges to encourage roosting for bats.

w. The group reviewed the aquatic recommendations. John stated MP 183 is essentially a clean water bypass. CDOT is currently throwing sand right into the river. We could pipe Polk and Timber creeks under the bridge to keep sediment out. Even though biologist say that Black Gore is a challenged stream, this might actually improve it. CDOT will identify those areas that could be piped.

x. MP 183 and 183.3 are the ones that said to look at removing culvert. Since they're already "clean water diversions" CDOT recommended keeping them piped.

y. Jonathan mentioned that back on the terrestrial recommendations at MP 183.3 under bridge is heavily used by skiers. If possible, he would like to widen it and dedicate a skier-only crossing.

z. Any comments or input from USFS? Matt K.- Not much additional input. It's been helpful listening to Michelle. Matt does want to make sure there's "cross-pollination" between ITFs. Should talk about proposed structures as they relate to recreation.

3. Trail Relocation Options

a. Trail alignments- CDOT's plan is to take the three different alignments and put them in front of all the ITFs to get feedback.

b. Michelle- are we looking at cost for the three locations? John- it only really makes a difference if it's a large magnitude of cost. We will use the Core Values to help balance issues and impacts. CDOT will also look at ease of maintenance. Michelle stated that she doesn't have an overall alignment recommendation other than disturb as little area as possible. She also understands that there are a lot of things to consider.

c. Kendall Bakich (CPW) couldn't attend the meeting but did say that timing for instream work is important. Alignments between stream and road- a shelf to catch sediment. If it does go on other side of stream, does it cause more off-trail use?

d. Michelle- try to stay out of timber stands. When you get up higher, up in the meadow, you may still be in line of sight of animals. At MP 185.2 under the bridge- CDOT should keep the trail as close to highway as possible bc we're going through a lot of timber stands. Most people aren't biking this trail for a "wilderness experience". Doesn't think we have to provide recreationalists a wildlife experience.

e. John stated that any path on south side of highway will have walls.

f. Michelle wanted to know what the feasibility is of putting the trail back to existing alignment. John- we could put it near the road, but maybe 20' away to avoid snowcasting and have it drop vertically.

g. Put the crossing structures and wall locations and details. ***ACTION- have Tyler add wall details.***

h. Michelle said to look specifically at area near 186. She suggested adding distance from highway and where the fencing may go to the maps. Michelle wanted to know if CDOT could run the trail diagonally near 185.2 to get it back to where it is currently. Maybe tree stand on south side of creek is more valuable than north side. Get it over Black Gore sooner rather than later.

MEETING NOTES

PROJECT:	21685 I-70 West Vail Pass Auxiliary Lanes
PURPOSE:	ALIVE Issue Task Force Meeting #2
DATE HELD:	December 14, 2018
LOCATION:	Miller Ranch Community Center
ATTENDING:	John Kronholm, Project Manager, CDOT Region 3 Karen Berdoulay, Resident Engineer, CDOT Region 3 David Cesark, CDOT Jeff Peterson, CDOT Drew Stewart, CDOT Cinnamon Levi-Flinn, CDOT Environmental Matt Klein, US Forest Service Alison Deans Michael, USFWS Paige Singer, Rocky Mountain Wild Michelle Cowardin, Colorado Parks & Wildlife Taylor Elm, Colorado Parks & Wildlife Pete Wadden, TOV Kristen Bertuglia, Vail Dick Cleveland, Representing Vail Town Council and EcoTrails Jonathan Lowsky, Colorado Wildlife Science Leah Langerman, Public Involvement Coordinator, David Evans and Associates Kara Swanson, Environmental Task Lead, David Evans and Associates Tyler Bowman, Engineer, Wood
COPIES:	Attendees, ALIVE ITF Members

Action items are shown in ***Bold Italics***

SUMMARY OF DISCUSSION:

1. **Introductions & Agenda**
    a. The group did introductions and Kara presented an outline of the agenda.
2. **Brief Overview**
    a. Kara reviewed the Issue Task Force (ALIVE) roles and responsibilities, Purpose and Need, recap of ALIVE meeting #1, and work completed to date on the project (see PowerPoint presentation).
3. **Wildlife Connectivity Comments**
    a. Kara noted that a summary of stakeholder comments from all sources and meetings regarding wildlife connectivity is in the presentation and handout packet.
4. **Wildlife Connectivity Recommendations**
    a. A multidisciplinary report was completed in 2011, as part of the PEIS. This looked at linkage interference zones (LIZs) for I-70 from C-470 to Glenwood Springs. These have been fine-tuned and made more realistic since. Jonathan Lowsky reviewed the

handout detailing the 2011 recommendations and updated 2018 recommendations by location (see Wildlife Connectivity Recommendations handout).

i. Proposing to fence the entire study area to keep animals away from the road surface and direct them to safe crossings.

ii. ***ACTION: Distribute 2011 report to attendees.***

b. MP 181

i. Improving/adding fencing will help guide animals to this underpass.

ii. Consideration: there is a lot of human traffic in this area, and could impact animals trying to cross here.

c. MP 182

i. Includes bridges near US 6 trail; this also spans the creek.

ii. Significant riparian habitat and wetland areas.

iii. A lot of animals use this crossing following the creek.

iv. Domestic dogs are a problem. Users let dogs roam leash-free. Surveys found a lot of dog tracks. Other animal tracks were discovered, but they were likely crepuscular/nocturnal.

v. Recommend working with USFS and CPW to encourage users to keep dogs on leash & away from riparian habitat.

d. MP 183

i. Follow the 2011 recommendations.

ii. Any benefit from removing the stream culvert offset by greater impact to stream due to contamination & sedimentation.

iii. Add vegetation on west side & coarse woody debris under the bridge to provide cover for smaller mammals.

e. MP 185.5

i. Follow the 2011 recommendations.

ii. Animals benefit from having a "wildlife lane" (separate from the recreation lane) with coarse materials under the structure to increase use of crossing structure.

f. MP 186.5

i. 2011 recommendation was for a crossing structure/arch at this location, but now have recommended it is moved to higher on the pass (188.3) instead.

g. MP 187.4

i. An overpass was recommended in 2011, but now is not recommended. Traffic safety issues and wildlife research shows that it is better to build more underpasses throughout the area.

ii. At the upper end of the project area, mule deer and elk are not target species for crossing structures. There is no reason for these animals to move perpendicular to the highway at this section; it's all summer range. Mule deer and elk often follow drainage patterns. The upper area of the project has no major drainages running perpendicular. Deer typically cross lower, crossing below MP 186.

iii. Lynx do exist in the upper portion of the project area. Studies in Banff have shown that lynx readily use underpasses. Lynx shown to prefer crossing where their habitat approaches the roadway.

iv. Michelle Cowardin noted that Craig sent an email last night and has changed position – now believes the underpass structures should be larger.

v. John stated that State Patrol records two animal collisions per year in the upper portion of the pass. A recommended 150' overpass would cause more than the two accidents per year due to icing and shading. This is one of the areas with the highest crashes (peak at 187.5) already.

vi. Karen noted that CDOT doesn't want to impact safety on the roadway and go against the project Purpose and Need. This is why more underpasses would be a better balance for connectivity and safety.

h. MP 186.9

i. Michelle suggested that bigger is better for crossing structures.

ii. Julia Kintsch sent an email and recommends six-foot instead of four-foot diameter underpasses for medium to small species and substantially larger structures for large animal crossings at 187.4 & 188.3 sites. The project team is looking into making these changes and plans to follow this recommendation where possible (constructability will be considered).

iii. A small PVC pipe within the culvert has been shown to help encourage smaller animals such as martens to go through the larger culverts.

iv. John noted that the locations shown on the map and matrix are approximate, and will be adjusted slightly during final design as needed, and refined throughout the process.

i. MP 187.4

i. This is one of the largest crossings proposed. Julia and Michelle have suggested an even larger size.

ii. Elk is a species that is reluctant to use new crossing structures. Some have been shown that it takes elk three to five years to adopt underpasses. This is one of the reasons to consider even larger structures to help the elk and deer be more willing to use them.

iii. Michelle noted there is an underpass that is 42' wide and 14' high on SH 9 across two lanes of traffic. Four years later elk are still hesitant to use it, and deer are also slightly hesitant. The 211 is 14' tall and 16' wide and under six

lanes (this is a different purpose, by Eisenhower, but team members could go look at the size).

iv. Jonathan pointed out that moose have been seen in CDOT video using crossing structures. So there may be another species to consider.

v. Michelle brought up preference for a 14'x80' arch underpass (not a box culvert).

1. Deer prefer larger structures according to Michelle.
2. Typically takes animals 5 years to adopt smaller box structures.
3. Jonathan noted that the team is continuing to study to ensure that what gets constructed get used by animals.

vi. Michelle noted she is glad to see the team taking into consideration Julia's comments.

j. MP 187.8

i. A small underpass is proposed here. There is a lot of small animal activity here. Research shows lynx like to cross in this area where suitable habitat (indicated by presence of prey such as snowshoe hares and pine squirrels) is located on both sides of the highway. They also prefer natural crossings where streams intersect roads.

k. MP 188.3

i. This is the largest structure proposed.

ii. This should be large to accommodate elk if they choose to use it. There is no elk collision evidence to suggest that a problem exists. Although no current evidence of elk crossing activity in this area, they may once suitable crossing structure is placed. May not be crossing in area because of I-70 as barrier.

iii. Julia recommended a 16' x 80' arch with vegetation because there is research showing elk prefer to use arches for underpasses.

l. MP 188.7

i. A 4-6' structure is recommended for small to medium animals. Julia recommended 6-foot.

ii. Adding structure to the substrate will improve the use.

iii. Studies show that a smaller adjacent pipe would improve use.

iv. Adding vegetation on either side will also improve use.

m. Entire Project Area

i. Research has been shown that shelves installed within any existing drainage structures crossing the highway would be used by small mammals such as mice, voles, etc.

ii. Will be examining improving bat habitat under existing bridges, as recommended in the 2011 study.

iii. Vail Pass accumulates more snow than Banff. The Banff study has been used a lot as reference, so this needs to be kept in mind. Snow may block some structure openings if using Banff guidance. The team is considering designing the structures long enough so the openings extend away from the road and they don't get blocked by plow casting.

iv. Michelle recommended a lynx crossing between the interchange at 190 and the sand shed. John noted that the project team looked at this. In general, the topography isn't friendly for this, but there is a potential for one spot south of the truck parking. It could be two separate culverts with an opening in the median.

v. Michelle obtained lynx data from John Squires from 2010-2011. There are two females and two males that had a lot of movement on the west side. Successful female cross at 189.7. This is what spurred Michelle's recommendation for the lynx crossing at the top of the pass.

vi. Michelle questioned if culvert at 188.6-188.7 was part of the original discussion? Yes. Michelle noted this should also be enlarged because this will likely fill with snow in winter. The 4x4' should be made 6x6' or 8x8'.

vii. Michelle noted that Julia suggested for larger structures (especially 188.4) will need barriers to prohibit snowmobiles from using the structures (a barrier such as concrete bollards, which allows animals but not snowmobiles). John suggested additional signage could be paired with this. Michelle suggested the signage will be ignored. Jeff noted that snowmobilers use muddy pass crossing and signs have not deterred them. John suggested this should be taken into account in the detailed final design phase.

viii. John asked if there is a reason snowmobiles aren't allowed to go past Black Lakes. Dick Cleveland noted that it is part of travel management plan to prohibit them. Michelle suggested it was because of wildlife.

ix. Jonathan noted that skiers coming down East Vail chutes at MP 183 diminish the benefits of the wildlife crossing there.

x. Kristen asked if there is a big difference in effectiveness between underpasses and overpasses. Jonathan noted that there is evidence that overpasses are great for larger animals since they are more willing to use them. However, underpasses are also used by all of those species. The target species in this area aren't really the ungulates. In this area it seems more beneficial for more underpasses than one or two large overpasses.

xi. Kristen asked how to mitigate for snow plow casting. John said Julia recommended 80' wide underpasses. John noted this would mean a bridge in those locations. At 187.4, for instance, this is one of the highest accident locations already. Building a bridge here would add another ice hazard on the roadway. There are some variables to consider before recommendations

are finalized. There are some locations where the roadway dips down, where there could be an opportunity to build a bridge and flatten the roadway.

xii. Michelle noted that the CO 9 overpasses were never planned to accommodate big horn sheep, but they do use it. So, even though big horn sheep are not expected to cross I-70 on Vail Pass, they may use a crossing if it is provided. CPW released big horn in Gore range that are moving east.

xiii. Michelle commented that 22,000 mule deer crossings were documented using the CO 9 five underpasses and two overpasses in a three-year period. Not migratory, but building a larger structure to encourage more crossing would improve the situation. She agreed with recommendation for more underpass structures.

xiv. Jonathan showed tables from the Banff study to show that WVP target species used both overpass and underpasses. Banff study of five - 23' wide by 12' tall structures at 190' in length had a 76% success rate of deer using structure. No studies have yet to report a structure as 100% effective, as either an overpass or underpass

5. Aquatic Recommendations

a. CPW strongly believes fish barriers at Pitkin, Miller, and Polk Creek need to be maintained and/or improved to protect upstream cutthroat trout conservation population.

b. The 2011 recommendation was to use culverts to restore streams flowing below bridges.

c. Jonathan and Kendall agreed that the threat of the contamination from mag chloride, petro chemicals, sand, etc. supersedes the recommendation to pull culverts to improve aquatic habitat.

d. Michelle noted that pipes are not CPW's preferred improvement. They create a barrier for animals to cross the stream. In areas where there is an open stream, there isn't a need to cover it because the pollution and plow casting can enter anywhere else along the stream. This could also cause maintenance problems. She suggested maybe sediment traps could be more useful.

e. The biggest thing will be to maintain and repair fish barriers.

6. Trail Realignment Options

a. John reviewed comments received regarding trail alignments (see PowerPoint). Highlights include:

i. Need to fix sight distance and radius of curve near 185.2.

ii. Kevin Sharkey with Eco Trails has provided a lot of feedback, including a recommendation to widen trail to 14-feet where possible.

iii. Shared sentiment has been to keep the trail away from the creek.

iv. Add etiquette signs to encourage good interactions (passing lane mentality).

v. Need to keep trail open during construction.

vi. Karen noted that all of the ITF and public feedback is being considered and incorporated and will be shared at Technical Team (TT) meeting #8.

b. Karen emphasized that the trail challenges are balancing the recreational needs with environmental, and the team is looking at it from many avenues.

c. Michelle asked how sediment is considered in the trail design. John noted that there has been discussion to strategically locate the trail between the creek and the highway, add a concrete pan to collect the sediment. However, this is not yet decided and could create a safety issue on the trail. More investigation is needed and this will be discussed with the SWEEP ITF.

d. Trail alignments were reviewed by Tyler Bowman (see PowerPoint slide).

i. All three options have pros and cons, and more investigation is needed before a decision can be made. All involve moving the portion of the trail that is currently adjacent to the highway, and all tie into the same places at either end.

ii. Mid slope – closest to existing.

1. Constructability challenges of building a trail near the existing

2. Less environmental impact

iii. Intermediate – hybrid of the existing and across the creek.

iv. Creek – crossing to the after side of the creek.

1. More environmental impacts

e. Jonathan reviewed the trail alignment option matrix. He noted that his comments are from a wildlife perspective only, which is a viewpoint that can typically be in conflict with user experience perspective.

i. From wildlife perspective, it is best to keep trail where it currently exists.

ii. Largest wildlife concerns are where the trail relocation will cut through wildlife habitat and threaten integrity of Black Gore Creek aquatic habitat. Also, walls are a concern.

iii. A 3,675 long wall is proposed with a maximum height of 23', around MP 186.

1. Michelle noted that even 4-6' tall wall is a barrier.

2. John noted the wall would get even taller if the trail is widened beyond the 10' that is assumed on the plans currently.

iv. Jonathan noted Option 2 may cause more problems because it goes through the forested habitat and crosses Black Gore Creek.

v. Michelle noted that there is a possibility to limit walls and limit crossings of the creek by using a hybrid alignment.

vi. Jonathan noted that between MP 186 and 187 there isn't as large of a wildlife presence.

vii. Jonathan summarized that overall from a wildlife perspective, the best course of action would be to avoid forest fragmentation, avoid disturbance of wildlife habitat, stay close to highway as possible, and avoid introducing another area of influence to wildlife habitat.

viii. Michelle said where MP 187 begins, would want to have the trail converge sooner to avoid more wall.

ix. Dick Cleveland can't support the trail as proposed due to potential impacts to water quality and animals. He suggested that this trail should be elevated similar to Glenwood Canyon, built on a very narrow footprint, put on whatever route works best for everyone else. It would reduce cutting forest, increase ability for all animals to cross area, cross avalanche chutes with minimal impact, span creeks without touching creek banks or riparian areas. It could be built all in advance and not disrupt trail use. Moving trail from ROW gives additional 50' of area for sediment control. If the trail was elevated there would no human impact. From a maintenance standpoint, it would require little to no maintenance (no roots pushing, no sedimentation). This would be a continuous bridge viaduct.

1. Michelle will think about how this will affect wildlife.
2. Would need a rail and would need to be aesthetically pleasing.
3. Jonathan noted that building the trail over the habitat may not have much benefit, because it is the presence of humans at all that has impact on many species.
4. Michelle and Jonathan thought it would reduce impact to water quality, but may not benefit wildlife as much.
5. Jeff noted that if the viaduct is cheaper than the huge walls, and there isn't a difference in a certain location wildlife-wise, maybe go with the viaduct.
6. Michelle noted the visual impacts from I-70 will also need to be considered.
7. Jonathan noted walls are barriers to all non-avian species.
8. John noted the raised viaduct could be used as another tool to dovetail with the other options in a combined solution.

x. Michelle noted Option 3 is very hard for Parks and Wildlife to support.

xi. John noted most of Vail Pass is not built on bedrock, it is on moving alluvial soil.

xii. Michelle noted on page 21 -22 wall will have minimal impacts to wildlife, as long as pink line is brought up to blue line before it gets to the crossing structure.

xiii. Michelle also suggested stream crossings should be limited. This will help limit human contamination of streams.

xiv. John noted people sometimes swim, fish and picnic at Basin of Last Resort (page 10).

xv. Jonathan noted that all wildlife species use riparian areas, and riparian habitat is the most important habitat. Plant and wildlife diversity along Black Gore Creek is thriving and we should avoid disturbing it.

xvi. Kara noted also need to consider this as a contributing feature in the historic district.

7. Next Steps for Trail Alignment

a. SWEEP meeting moved to end of January.

b. Additional USFS coordination.

c. Final recommendation will be presented at TT #8 in late February.

8. Upcoming Schedule

a. Design will be refined over the next month based on TT and ITF feedback.

b. CDOT and FHWA will make design decisions.

c. Next TT meeting in Feb/March 2019.

d. Decision document is expected in early 2020.

e. No final design or construction funding yet.

f. ***ACTION: ITF members should send any additional comments on today's information by January 4th.***

9. Wildlife Fencing Along Highway

a. Michelle questioned if with snow loads, should a higher fence be used (from 8 – 10 feet).

b. Jonathan noted that powder snow is different than sun-hardened snow or snow plow spray.

c. Paige Singer asked if there will be issues with maintenance to the fence in this area with so much snow.

d. ***ACTION: Alison Deans Michael will send information on CDOT Region 1 and Region 5 mesh/grates to Jonathan.***

e. Michelle noted that CPW would like to keep disturbance through entire project as small and narrow as possible, and not impacting any areas that could be avoided.

10. Additional Comments Received After Meeting

a. Jen Prusse feels strongly that Options 2 & 3 retaining walls will be an impediment to wildlife. Especially Option 3, since it could impede wildlife from accessing water source.

MEETING NOTES

PROJECT:	21685 I-70 West Vail Pass Auxiliary Lanes
PURPOSE:	SWEEP Issue Task Force Meeting #2
DATE HELD:	February 11, 2019
LOCATION:	Avon Library
ATTENDING:	Andy Herb, Alpine Eco Dave Cesark, Environmental Lead, CDOT Region 3 Paula Durkin, CDOT Region 3 Jen Klaetsch, CDOT Region 3 John Kronholm, Project Manager, CDOT Region 3 Becky Pierce, CDOT Devin Duval, Colorado Parks and Wildlife Taylor Elm, Colorado Parks and Wildlife Kara Swanson, Consultant Environmental Task Lead, David Evans and Associates Siri Roman, Eagle River Water and Sanitation District Caroline Byus, Consultant for Eagle River Water and Sanitation District Larissa Read, Consultant for Eagle River Water and Sanitation District Pete Wadden, Town of Vail Matt Klein, USFS Brad Bettag, Wood
COPIES:	SWEEP ITF Members

SUMMARY OF DISCUSSION:

1. Introductions & Agenda

a. Kara apologized that this meeting has been rescheduled three times in an attempt to better accommodate ITF member schedules and the weather, but still some are unable to attend today.
b. Karen offered one-on-one meetings with any ITF member requesting additional discussion.
c. Kara reviewed the agenda. Will discuss how SWEEP ties into future parts of the project.
d. Meeting goals- everything presented today ties back to the implementation matrix from the MOU

2. General Project Information

a. ITF Responsibilities
    i. Recommendations to take back to PLT – decisions lie with CDOT and FHWA – identify mitigation and enhancements
b. Project Purpose & Need
    i. Purpose and Need is to improve safety and operations on West Vail Pass
c. Recap SWEEP Meeting #1
    i. Introduction to the project, CSS, SWEEP MOU, - this was prior to field work or proposed action, reviewed list of background data sources, used to refine data work.
d. Project Status

i. Kara described the alternatives screening process.
    1. Criteria for Level 1 screening was based on Purpose and Need (P&N), if any alternative answered "no" to safety and operations questions, it was eliminated as CDOT cannot carry forward an alternative that does not meet P&N, other than the No Action. ,
    2. There were also criteria based on Core Values, but only ones that could easily be answered as "yes" or "no" since Level 1 is not a comparative analysis between alternatives and we didn't have enough information to answer "yes" or "no" for most of the Core Values. However, understanding that the Core Values are extremely important, many of them were used to develop the Level 2 criteria.
    3. After Level 1, only one action alternative met the P&N, which was the auxiliary lanes with curve and ITS improvements alternative. Because of that, the criteria from the Level 2 screening will actually be considered during the impact and mitigation assessment for the EA.
    4. After the Proposed Action was identified, there was an internal design team workshop and to start incorporating design options such as wildlife crossings, water quality, recreation path realignment, etc.
    5. The team also met with CPW and USFS to discuss wildlife and the trail.

ii. Caroline – when will you complete the EA? Kara – public can submit comments at any time, looking towards the end of the year for the EA. There will be a 30 day time period for public comment on the EA,

iii. Caroline – regarding public comments, how do the comments fit into the final report? Kara- the comments are included in the decision document,

iv. Larissa – will there be a draft and final EA? Kara – no, only the final EA for review and comment. Any changes would be included in the decision document.

e. Stakeholder Comments Summary
    i. Kara went through the slide –conversations and involvement of ITF will still happen as the project moves forward and into design

3. Sediment Management Implementation Flow Chart

a. The flow chart focuses on sediment management – water resources tech memo happens during the EA – this all feeds into the EA and decision document, blue box first and then move into the green box, will incorporate both project specific and other mitigation measures outside of the project

b. John – this EA will commit to re-doing the SCAP as part of the design process

4. Project-Specific SWEEP Implementation Matrix

a. Talks about how we are addressing each one of these categories

b. Sediment Management
    i. Brad reviewed the matrix. There are a lot of limits to what we can incorporate due to space. Developing maintenance manuals for BMPs. Continued monitoring in basin.

ii. 2002 SCAP project review – numerous SCAP recommendations have been implemented in the time since the 2002 SCAP. Those that are marked "complete" are green, partially complete are yellow. There were instances where certain BMPs were recommended but something else was implemented. Corridor has not been static. There has been noticeable improvement since 2002. Some things that have been implemented haven't been structural- better equipment and training, shoulder cleaning, increased use of deicing elements other than sand, etc.
iii. Not all recommended improvements have been implemented. What's next? Low-hanging fruit have been implemented. A lot of the additional BMPs would be good to implement with large project construction. Opportunities for BMPs to be installed when traffic is being diverted. Since 2002 there has been a lot innovations in BMP technologies. Project team has been looking at other states and SCAPs for ideas.
iv. Taylor- are the "green" BMPs still going to work with the proposed action? Brad- if the BMP will be impacted by the alignment, we will have to replace or mitigate for it.
v. Siri- what level of detail will be in the EA vs. what will come later? The concepts will be identified in the EA but will not specifically where items will go because we're only at conceptual design. At the decision document we will describe the intent.
vi. Don't make water quality an afterthought- input from stakeholders will continue throughout the EA process.
vii. Funding? CDOT is trying for a freight grant. Will look at phasing for other funding options. Can't be funded solely from asset funding. There are other funding options out there, but need to have a phasing plan in place. The project will be assessing impacts and mitigation as a project as a whole and not be identified piecemeal. This corridor is #1 for crashes per volume of traffic in the state.
viii. Pete- back to the alternatives- we looked at several different options of alternatives. Did they consider other options such as traction law enforcement, carpooling, etc. We had a PEIS, which identified a preferred alternative. The PEIS identified and implemented non-structural measures for the I-70 Corridor. We took it a step beyond that and analyzed additional alternatives. A TDM type alternative wouldn't have necessarily helped with safety.
ix. Brad described project-specific BMPs. Will describe locations the type of BMPs that may be useful at that location. The BMP menu will allow the designers to pick and choose BMPs based on intent, site constraints, etc.
x. USFS- have any of the BMPs in the menu been previously installed from the 2002 SCAP? Yes, some have, others have been used on other projects. These have also been vetted with CDOT maintenance in terms of ease of maintenance. Type D WQ inlet- Brad discussed the pros of them. But may not be good because of the volume of sediment. Karen- we compiled BMPs we know work well and others we found through research.
xi. The goal isn't necessarily to fill in everything from the 2002 SCAP but to create a new one that looks at feasibility of the previous recommendations, changes in roadway alignment and what's feasible.

xii. When does the analysis occur for sediment loading? When does modeling occur? Usually there will be initial examination during the alignment. There are also very specific requirements for the technical report for the EA that can be found in CDOT's NEPA manual.
xiii. How will this project enhance the environment? Proactive rather than reactive. Instead of a band-aid, it's a holistic approach. From a wetland perspective, there are opportunities for wetland enhancement. Looking at areas where we can enhance wetlands. We have the opportunity to be proactive. Can attract wildlife and have them use the underpasses.
xiv. In terms of the sediment impacts in the future- are you trying to capture 100%? It's always the goal, but can't guarantee anything. We will try as best as possible to capture everything but there may be areas we miss. We need to honor where we are in the process. Andy- also talking about redundancy- not just going to drop an inlet in. There will be secondary and tertiary opportunities as well- veg swales, riparian enhancement.
xv. Siri- thinks there should be adaptive management. The ERWSD wants it documented well. Less interested in what we're implementing but focused more on the intent of the mitigation measure. Let's focus on the science- what can we achieve? Would like to see defined goals.
xvi. Larissa- when would the SCAP update happen? A little more definition of the timeline of when the SCAP will happen.
xvii. John- some of the items for the SCAP update may be outside the scope of this project. Monitoring the steam would be one of those. This project will implement the construction of physical features within the project limits and does not pay for other items, such as monitoring. Monitoring has already been put into place by the State since 2001 and is on-going.
xviii. Martha- Collaborative Effort ensures that the PEIS is followed.
xix. Karen- how has CDOT's approach been in the past? Jen- Straight Creek- TMDL was done right after the SCAP was completed. Committed to 25% of sand pick-up. Continue to track that and just revisited past numbers. Varies year to year – lots of variables. Have been talking to maintenance about the variances.
xx. Karen- will need to talk as an organization on how we can commit to meeting our goals. Can we even commit to a certain level of chlorides?
xxi. Siri- structures only work as well as they're maintained. Could you look at averages for goals? The board talked about it last month. They really want to have a monitoring approach- doesn't matter how it happens, just that we work together to do it.
xxii. Larissa- monitoring is integral. A FONSI needs to be truly a FONSI. They need more confidence in what "no significant impact" means since FHWA doesn't have a standard for what significant is.

c. Section 303(d)
   i. Brad reviewed 303d listing for BGC. BGC has been delisted from 303d for Macroinvertebrates, but is still listed as M&E. The stretch of BGC above Miller Creek has also been delisted from 303d for sediment. The lower portion remains 303d listed for sediment. We are specifically targeting sedimentation impacts and that we are addressing those concerns with this project.

ii. Siri- Dave Reece is sampling macroinvertebrates. New data is available linking macro to mag chloride. Siri would be happy to have Dave present to the project team.

d. Wetlands Protection
   i. Andy presented an update on the wetland information. Andy conducted field work this past summer/fall. All mapped wetlands are shown on the handout maps. Wetlands were mapped based on hydrophytic vegetation and hydrology, not soils. When we are ready to permit, they will be officially delineated. Andy also recorded wetland type, classification, water source, stressor, photos, and mapped them. Each wetland was given a score – A, B, C, D. there are some "A" wetlands. A lot of other "B" ones. Ones close to the road are "D" as they are primarily created by roadway runoff.
   ii. Where are the high-functioning wetlands and what do they mean to the project? They will be color-coded on maps but the only way to determine if there are fens/peatlands is to check soil, which will be done in 2019.
   iii. Larissa- will wetlands be analyzed in the EA? Yes.

e. Maps
   i. A couple highlights- MM 182. Wetland study area is the green line. There may appear to be truncated but it's just because of the study area. MP 184- there are some big wetlands above Timber Creek. As you travel up the pass, MP 187- large wetland complexes along Black Gore Creek and more and more wetlands as you go higher in elevation. Andy has identified wetland enhancement/mitigation opportunities, which can be included in the EA. The actual mitigation package will be done when it's time to permit the project.
   ii. Will do the soil confirmation for fens after the snow is gone.
   iii. USFS and CNHP both did fen studies, we have that data.
   iv. Generally, wetlands closer to the road are lower quality and stormwater fed, with a few exceptions. Creeks and tributaries hold a lot of restoration/enhancement opportunities.

f. Special-Status Aquatic Species
   i. Jonathan Lowsky is our biologist and has been talking to Kendall with CPW and the USFS. The USFS doesn't recognize any special status species in this area. CPW does recognize native cutthroats in some tributaries. Our recommendations are to maintain the existing fish barriers. There are other tributaries near 183 – at the ALIVE meeting we discussed whether we should remove the culverts and restore the tributaries or keep the culverts in place. The decision was made to keep everything in place because an open channel could fill with sediment.
   ii. * Follow up with Jonathan on the toads. There is a beaver pond/wetland area there too. The pond is outside of the project limits.
   iii. Caroline- how far west does the project start? East Vail. 180-190. Another concern is the potential for accidents/spills for hazardous materials. How does that factor in to this project? Karen: We haven't looked at it yet. Martha: The responsible party (trucking company) is responsible for the impacts. We are looking at improving truck ramps.
   iv. Existing BMPs could be improved to help reduce the hazmat reaching the creeks. Existing BMPS have helped collect hazmat spills, an example is the

hydrochloric acid spill at MP 183 that a sediment pond helped to capture and prevent the spill from spreading.

g. Aquatic Species as a Recreational Resource
    i. Pete – gold medal fisheries are downstream (5 miles). Impairments start in East Vail. It's been worse in Gold Medal section. East Vail area – there is a very definite impact to macroinvertebrates. Could be close proximity to highway. More pavement along with other impacts cause issues in the creek. In that area, the highway is primary land use and there is concern about macroinvertebrates.
    ii. Siri- The downstream Gold Medal Fishery should be considered. Thinks it should at least be acknowledged as an input. She thinks that if we have enhancements from the project that it would directly improve that area too.
    iii. Martha- macroinvertebrates goes down near East Vail to the wastewater treatment plant?
    iv. Vail tends to deemphasize impacts from I-70 since residents don't have much control over that.
    v. Siri - Impacts to the Gold Medal stream are from urbanization of Vail
h. Information and Research Needs
    i. Jen presented the water quality monitoring reports for Black Gore Creek- what's measured and when. CDOT has been monitoring BGC since 2001 and issues reports every 3 years.
    ii. Connectivity and chloride are measured year round. Turbidity probes are used in high run-off times.
    iii. With suspended sediments there is a correlation to erosion. Phosphorus was also found to be high. Highway runoff is dominated by chlorides. Sodium chloride is high as well as mag chloride. This data has been shared with other groups and the consultant will summarize the 18 years of data and share it.
    iv. Siri- for mag chloride- are there proprietary ingredients? Jen- had talked to maintenance but they haven't gotten the MSDS sheets yet. We can try to get those again. Pete- Chris Kobesach- CSU- worked with CDOT and got the slurry to do his tests and the impact of that product on water quality.
    v. Siri- take the wet effluent and test that. Kara requested that ERWSD send any results they may have.
    vi. Jen- the "ice-slicer" mixed with sand is also used, which is proprietary.
i. Trail Discussion
    i. *send out the 11x17s of the trail relocation maps and the detailed matrix. Add sections that are within 100 feet of the creeks.
    ii. The end result will likely be a hybrid of the alignments shown today. John reviewed the three different alignments. Least impactful one is likely the one between the current road and the creek. The stretch that we're impacting is 2.5/3 miles of the trail. We will leave the rest of the trail where it is currently. Feedback we're looking for is for concerns regarding locations of trail realignment.
    iii. Pete- minimize creek crossings – there is more potential for people to use the creek. User experience is important but keeping it on the same side as the road and use walls or barriers to separate the trail from the road.

iv. Taylor- crossings and wetland impacts are a concern – should minimize the trail paralleling the creek through wetlands. Try to make crossings perpendicular instead. Will talk to Kendall after this as well.
v. Devin- sediment accumulation on path that could run off is a concern. Should mitigate the runoff from the path.
vi. Pete- might be opportunities to also capture sediment from path. Karen- yes, we've been discussing that.
vii. USFS – have you looked at how potential walls could interact with wildlife crossings? Yes, these areas were identified and moved where appropriate.
viii. Andy- most of the orange alignment is not in wetlands with the exception of higher up.

5. Schedule and Next Steps

a. Matt- please let the USFS know if we do have any data needs.