MEETING NOTES

PROJECT:	23982-23929 I-70 West Vail Pass Safety and Operations Improvements
PURPOSE:	ALIVE ITF #3 Meeting
DATE HELD:	February 10, 2021
LOCATION:	Online Google Meet Meeting
ATTENDING:	John Kronholm, Project Manager, CDOT Region 3 Karen Berdoulay, Resident Engineer, CDOT Region 3 Rob Beck, Program Engineer, CDOT Region 3 David Cesark, CDOT Region 3 Matt Figgs, CDOT Region 3 Cinnamon Levi-Flynn, CDOT Jeff Peterson, CDOT Carole Huey, US Forest Service Jen Prusse, US Forest Service Kristin Salamek, CDOT USFWS Liaison Michelle Cowardin, DNR Jeff Bellen, FHWA Stephanie Gibson, FHWA Pete Wadden, Town of Vail Jen Bradtmueller, Kiewit Jim Thomsen, Kiewit Mark Gutknecht, Kiewit Julia Kintsch, ECO-resolutions Paige Singer, Rocky Mountain Wild Jillian Mauer, Pinyon Environmental Randal Lapsley, R S & H Mary Jo Vobejda, Jacobs Jim Clarke, Jacobs Pat Bastings, Jacobs Loretta LaRiviere, Jacobs
COPIES:	Attendees

SUMMARY OF DISCUSSION:

1. **Introductions & Meeting Purpose**
    a. Karen introduced the attendees at today's meeting.
    b. Mary Jo reviewed the purpose and goals for today's meeting:
        - Gather feedback on the ALIVE (**A** **L**andscape Level **I**nventory of **V**alued **E**cosystem Components) process to ensure the project is successful. Topics for today's meeting are:
            i. Review EA and INFRA project commitments
            ii. Understand team roles and responsibilities
            iii. Gather feedback on approach to wildlife crossing development
2. **Work Completed**

a. Karen said the FONSI (**F**inding **o**f **n**o **S**ignificant **I**mpact) was signed and published on the CDOT website on February 9, 2021.

b. Mary Jo said a survey was sent to all PLT, TT & Issue Task Force (ITF) members and the purpose was seek feedback on how the CSS (**C**ontext **S**ensitive **S**olutions) process went during the last few years while developing the EA. The survey focused on the CSS process, not the outcome of the project. The survey questions covered multidisciplinary nature of the teams, regularity of meetings, team effectiveness, reflection of the community's qualities, collaborative discussions, project stakeholder contributions, input through the process, availability of resources, and 2-way communications.

   i. The survey was sent to 54 participants in the previous process and sixteen responses were received. Overall, the results were 80% positive responses. Some comments suggested more 2-way conversations and more opportunities for feedback as improvements.

   ii. Mary Jo said if anyone has suggestions on how to improve 2-way conversations and opportunities for more feedback they can email us their suggestions.

   Mary Jo said that based on the feedback received from the TT (**T**echnical **T**eam) their meetings will now be monthly and have been scheduled through June. The PLT (**P**roject **L**eadership **T**eam) will meet quarterly. The TT has met twice and the PLT once.

c. Revisions suggested for the PLT, TT & ITF membership have been incorporated.

d. The design team is starting to work on the first projects for the INFRA Grant.

3. INFRA (**In**frastructure **f**or **R**ebuilding **A**merica) **Grant Project Scope**

a. Karen said the overall project is estimated to be $700M. The first phase is $140.4 M for design and construction. The reason we chose the scope shown is we want to optimize safety and operations in the eastbound direction.

   i. A third lane will be added from MP 185-190 and increasing the inside shoulder from four-feet to six-feet and the outside shoulder to ten-feet. In this area we are installing six wildlife underpasses and fencing. The fencing will connect with the bridge MM 185 at the bridge and extend it up to the top of the pass.

   ii. Glare screen barriers will be installed on both the east and westbound medians where they are at the same level.

   iii. The recreation trail will be relocated further away from I-70 from MP 185 – MP 187 to make room for the eastbound third lane.

   iv. Because of the high crash rates at the curves at westbound MP 188 and MP 186, the curves will be smoothed to meet current geometry standards and increasing the inside shoulder from four-feet to six-feet.

   v. The bridge at Eastbound MP 185 is in poor condition and is Bridge Enterprise eligible so will be reconstructed. This is where the auxiliary lane and shoulder widening begins.

vi. Straightening out the lower truck ramp at MP 182 to meet current truck ramp standards.

vii. Installing signage improvements throughout the corridor including a variable speed limit system.

viii. Installing an automated highway closure system at the bottom and top of the pass with overhead signage and a push-button gate.

ix. Installing an anti-icing system on the eastbound bridge at MM 184.

4. Overall Project Design and Construction Schedule

a. Karen said the project will be using the CMGC (**C**onstruction **M**anager/**G**eneral **C**ontractor) method. The grant commitment is to start construction this summer of the first construction package. Since the SCAP (**S**ediment **C**ontrol **A**ction **P**lan) won't be completed by then, we are evaluating scope that does not include impervious surfaces. The first construction package being designed are the highway closure system, and the lower truck ramp reconstruction. The remaining three construction projects are to be determined later.

i. The ITFs will be more heavily involved early on. ALIVE especially dictates some of the major design elements so we want to get your feedback early in the design process. and will continue to be involved during the design.

ii. Karen said the I-70 CSS process will continue throughout construction.

iii. Design will be completed by the end of 2022 and construction will be done by the end of 2024.

iv. The CAP #1 project design will be finished in May. The remainder of the project will be at FIR in the fall. Then we will start to break out the packages and prioritize them for delivery in February 2022, May 2022, and December 2022.

5. CSS Process

a. Mary Jo explained we are now in Life Cycle Phase 3 of the CSS Process: Project Design. During this phase, we will be looking to ensure the options best serve the decisions that were made in the EA. This phase will ensure the mitigation commitments are incorporated.

i. Jen inquired what CSS meant.

a. Mary Jo explained that CSS is the acronym for Context Sensitive Solutions which is part of the I-70 Mountain Corridor Programmatic Agreement and the ROD (**R**ecord **o**f **D**ecision). This process ensures the design solutions are sensitive to the context. The process includes stakeholder involvement with people who live and use the facilities, and their input is included into the design or solution that is sensitive to all the context issues.

b. The five Life Cycle Phases of CSS are:

1. I-70 Mountain Corridor Planning
2. Project Development
3. Project Design
4. Project Construction
5. I-70 Operations, Maintenance and Monitoring

c. The CSS 6 Steps during this Phase remain the same as the other phases:

i. Define the Actions (Defined in the EA Preferred Alternative and Mitigation)
ii. Endorse Process (by TT & PLT)
iii. Establish Criteria (ITF methodology)
iv. Develop Options (ITF may or may not develop)
v. Evaluate Options (ITF and TT recommendations)
vi. Document (Environmental Mitigation Tracking)

d. Mary Jo noted there may be design options for some of the ITFs but there may only be one way to reach the mitigation using the ITF methodology.

e. Documentation of the methods used for meeting the mitigation will be included in design. Construction of the mitigation will be documented in the Mitigation Tracking Table.

f. Mary Jo reviewed the different ITFs and how closely one impacts another:

i. 106 / Aesthetics - Design exceptions/Rec Trail/SWEEP/ALIVE
ii. SWEEP (**S**tream and **W**etland **E**cological **P**rogram) - Aesthetics/ALIVE
iii. ALIVE - Aesthetics/SWEEP
iv. Recreation Trail - Aesthetics
v. Design Exceptions – Aesthetics

g. The recreation trail is being looked at by the TT rather than setting up a separate ITF.

h. An Emergency Services ITF has been added and a meeting is scheduled for March 29th.

i. Julia said you will be hearing more about the coordination between the different ITFs at the next meeting.

6. ALIVE MOU (**M**emorandum **o**f **U**nderstanding)

a. Julia introduced herself as a part of the RS&H team. She noted she has a long history of working on the Corridor and West Vail Pass and was part of the ALIVE committee that prepared the I-70 Corridor ALIVE MOU. Prior to the that, she and Paige completed the I-70 Ecological Project which revisited the originally identified corridor LIZs (**L**inkage **I**nterference **Z**ones). She is excited to be a part of this project, the design team and finally realize the vision we've had in the Corridor for several years.

b. Julia said the ALIVE MOU evolved during the I-70 PEIS process and identified the need for interagency coordination to achieve our wildlife mitigation and connectivity goals along the Corridor. It was signed by all the participating agencies (CDOT; FHWA; US Fish & Wildlife Service; US Forest Service; US Bureau of Land Management and the Colorado Department of Natural Resources, Division of Wildlife) in 2008.

c. Julia quickly reviewed the objectives:

   i. Increase the permeability of the I-70 Mountain Corridor

   ii. Streamline interagency coordination

d. Julia then explained the major commitments:

   i. Ensure functional Linkage Interference Zones (LIZ) and wildlife passages

   ii. Ensure agencies cooperate in early and full implementation of corrective actions to solve permeability problems in identified LIZs

7. INFRA Project EA Commitments Related to ALIVE

a. Julia said the West Vail Pass Auxiliary Lanes Project lies entirely within the West Vail Pass LIZ. She noted the ALIVE ITF last meeting was in 2019 during the EA process. The agencies will continue to work together during design to create mitigation solutions in this portion of the Corridor. She then went on to explain the specific EA commitments for wildlife.

b. The Terrestrial Wildlife Connectivity Commitments include:

   i. Improve wildlife movement and reduce habitat fragmentation in the study area

      a. Construct six new wildlife crossings (2 large and 4 small-medium culverts)
      b. Promote small fauna passage
      c. Place snow deflection devices to keep crossing clear of snow and debris and passable all year

   ii. 8’ high wildlife fencing will be installed from MP 185.2 to MP 190 with escape ramps every 0.25 miles. This is the portion of the fence that is funded as part of INFRA Project. The EA commitment is for fencing all the way down to East Vail.

c. The Threatened, Endangered, and Special Status Species – Canada lynx Commitments are:

   i. Ensure dark sky compliant lighting

      a. Do not direct lighting into lynx or snowshoe hare habitat

   ii. CDOT is required to provide an annual report documenting project impacts on Canada lynx and notify USFWS of any incidental take

d. Other Wildlife Commitments are:

    a. Survey bridges for bat use and, where needed, add features to promote roosting

    a. Aquatic connectivity will maintain existing fish barriers to prevent the spread of non-native species into headwater streams that support native trout populations.

e. Commitments During Construction include:

    i. Conduct work during daylight hours as much as possible to avoid impacts to lynx activity

    ii. Temporary lighting will be used with directional shielding

    iii. Concentrate construction areas to minimize habitat impacts and all temporarily impacted habitats will be restored

    iv. Where bats are present, suspend bridge construction during maternity season (May 15 – July 15)

    v. All Migratory Bird Treaty Act nest survey guidelines will be followed

f. The group had no additions or comments on the commitments.

8. Wildlife Undercrossing Locations

a. Julia said the team has been reviewing and evaluating the wildlife underpass locations originally proposed in the EA and she noted there may be some shifts in locations.

    i. Julia said they don't anticipate any changes to the large mammal crossings at MP 187.3 & MP 188.3

    ii. There are some concerns for the originally identified small to medium mammal crossings locations between MP 186 – MP 190. Julia said they are coordinating with the roadway and drainage design teams to evaluate the functionality and feasibility of the original locations and determine what the best options are.

    iii. Julia noted the wildlife crossings may be concentrated higher on the pass in locations with the best habitat access and to avoid steep slopes and areas with higher levels of human activity.

        1. Michelle said her notes from the previous ALIVE meeting have the location for the large mammal crossing at MP 187.6, not MP 187.3.

        2. Michelle said that in 2008 at a West Vail Pass Linkage meeting, CPW said they had observed bighorn sheep crossings around MP 186.4. She wanted to get this on the record because all the crossings are above this location and there could potentially be bighorn sheep and, mountain goats may have moved through the lower locations, closer to The Narrows. Michelle said she would send her notes for both meetings to include with these meeting notes.

a. Julia said it's good to be aware of the bighorn sheep and mountain goats potentially using the crossings and they will keep it in mind. She said the locations haven't been finalized yet but in reviewing the EA locations, there were potential design constraints at MP 187. Closer to The Narrows there is steeper terrain and the bike path is close to the underpass location which limits what we can do in that location. It would be very difficult to construct the underpass at MP 186 because of the steep terrain. There was also concern about wildlife access to an underpass. The wildlife fencing will guide them to the existing bridge over Pole Creek at MP 185.5 which is suitable for bighorn sheep passage.

3. Jenn inquired what the specs are for the two large mammal crossings.
    a. Julia said the EA did not specify the exact size and the team will be focusing their efforts on the size and type as laid out in the methodology.
4. Jenn said for the small to medium crossings, bobcat was listed as a target mammal but not lynx, but she can't remember why this was differentiated.
    a. Julia said lynx is listed in the EA as a large mammal and it is a targeted species, though it is expected that lynx would also be able to use the small to medium mammal underpasses.

9. ALIVE Development Process

a. Julia noted the design is progressing for the first INFRA project at the same time the ALIVE team has been working on what we are presenting at today's meeting.

b. Following today's meeting, the ALIVE team will use your feedback and input to revise the preliminary crossing locations and expanding the methodology for determining crossing sites and sizes. This will be used to inform the design process.

c. The wildlife crossing design will be reviewed for conflicts and interactions with SWEEP features and other ITFs.

d. At the next ALIVE meeting we will get your feedback on the crossing locations, sizes, fencing details, aesthetic treatments, and interactions with SWEEP features.

e. Another ALIVE meeting may be scheduled if needed.

10. Methodology for Sizing and Designing Wildlife Crossings

a. Julia noted that you were emailed the complete methodology outline prior to today's meeting and she hopes you had a chance to review it. The proposed methodology reviews wildlife crossing dimensions, layout, and variables influencing the crossing success for projects located in similar landscapes and with similar target species. This approach ensures that the project team, in coordination with the ALIVE stakeholders, systematically address species' passage requirements and bring the best available research and practice to the design of wildlife crossings on West Vail Pass. This methodology is based on seven major considerations, described below:

i. West Vail Pass Mitigation Design Objectives

- Crossing structures use by all target species
- Designed to have a minimum 60% success rate with a goal of 80% for all target species at crossing structures
- There is no goal for wildlife/vehicle collisions because West Vail Pass has a very low incidence rate largely due to the barrier effect of the interstate. With the new crossing structures and fencing, we expect to see even fewer incidents.

ii. West Vail Pass Target Species

- Large mammal underpasses: black bear, Canada lynx, elk, moose, mountain lion and mule deer. The design focus is Canada lynx, elk, mule deer. By designing the structures for theses focal species, we will also accommodate the other mammals listed.
- Small mammal underpasses target species are bobcat, coyote, red fox, marten, marmot, snowshoe hare and weasels. The primary passage requirements for these species are providing a dry, natural substrate through the structure, good vegetation cover at the approaches and for the smaller fauna providing cover features such as rocks or woody debris piles through the structures.

iii. West Vail Pass Target Species Movement Types

- Lynx: There is an established resident breeding population just outside the project area on the east side of Vail Pass. Dispersal movements may be expected by members of this resident population frequently and dispersing members infrequently.
- Elk, Mule Deer during summer range. During summer the vegetation is abundant across the landscape, the populations are more dispersed, and we expect to see occasional use by individuals or small groups including mothers with their young of the year. We don't expect to see large herd movements through the crossing structures.

iv. West Vail Pass Population-Level Habituations Considerations

- Recreational activity, traffic, noise, and lights from I-70, the CDOT shed and truck parking area at the top of the pass are all influences on wildlife populations' responses to human activity in the project area.

v. West Vail Pass Roadway Footprint

- Approximately 150' at wildlife crossing locations (will shorten wherever possible, especially at the large mammal crossing locations).

vi. West Vail Pass Terrain Limitation Considerations

- Fill depth may limit the height of the large crossing structures. Balancing structure height while maintaining gentle approach slopes leading into the crossings.
- There are steep slopes between I-70 and Gore Creek

vii. Other West Vail Pass Variables Considerations

- Roadway features, e.g., walls and barriers
- Vail Pass Winter Recreation Area; recreation trail
- Sediment ponds
- Aesthetics

b. Julia said the next step will be to do a more in-depth review of successful crossings in other locations with similar conditions and target species. The results of the review will be shared at the next ALIVE ITF meeting to show how it informed the sizing and design of the West Vail Pass wildlife crossings.

11. Comments on Methodology

1. Kristin asked how will you monitor the mitigation objective of a 60% success rate and 80% goal for target species.
    a. Julia said these are design objectives which are the goals we are using to establish how we are designing the crossing structures for all the targeted species and understanding that crossing structure effectiveness is likely to vary among the target species.
    b. Karen said the design criteria dictates the size and design parameters for the crossings. CDOT is not able to track the success rates. We are looking into doing this as a parallel effort, but it isn't tied to mitigation for this project.
2. Michelle inquired if we should include bighorn sheep on the list but not as a targeted species.
    a. Julia said she didn't think there is much bighorn sheep activity in the area in the upper portion of the project area and it may be out of scope to include them in the methodology. Any bighorn sheep in this portion of the project area attempting to cross I-70 would be directed to the existing bridges under I-70 by the wildlife fencing.
3. Michelle said she realizes nothing is finalized but she would like to see more details about the new location of the recreational trail and the other structures such as walls and barriers. Those may impact the design and location of the crossings.
    a. Julia said the design team has been working to evaluate the trail location in relation to the wildlife crossings and looking for ways to gain some distance between the two. She said there will probably be more design details to share at the next meeting.

4. Karen said the team realizes it is important for all of the components to fit together. She reminded the group that each ITF needs to focus on their specific issues so that we can hear from the experts what their priorities might be. The balance between ITFs would be discussed with the TT.
    a. Paige agrees providing movement for elk is critical to provide for. She was curious what you consider small group movements because they have seen some fairly large groups during the East Vail Pass monitoring. Julia said she would like to hear more details about their monitoring project numbers.
5. Stephanie said the targeted large animals are deer and elk, but moose are also listed. Will the crossings sized for elk be the right size for moose to use?
    a. Julia said that moose aren't very picky about going through crossings despite their large body size and the design sized for elk will be appropriate for moose.
6. Michelle asked if the ITF will be able to give input on the recommended sizes at the next meeting.
    a. Julia said there will be internal coordination with the design team to ensure they have sizes they can work with and design.
    b. Karen said today we presented the methodology and based on your feedback we will revise the preliminary locations and crossing sizes. At the next meeting we will provide an update and seek feedback on the sizing, locations, and other design considerations.
    c. Mary Jo asked for flexibility in timing of the next meeting so we can time the meeting for when the materials will be ready. The design is moving forward which would mean the next meeting will probably be in April. We will schedule that meeting as soon as we can.

12. Design Approach to Wildlife Fencing

a. Julia said we are focusing on the fencing within the INFRA Project boundaries. The western end will tie into the existing Polk Creek bridge. The east end will go up to the rest area exit around MP 190.

b. There are some questions to evaluate on where to install the fence along the roadway. The west side of the interstate is complicated because there is very little room between I-70 and Black Lakes Road, and they need to make sure the fencing won't be damaged by snow cast from snowplows.

c. Coordination is needed with the Vail Pass rest area project activity and the proposed wildlife crossings mitigation on the east side of the pass.

d. Escape ramps will be placed approximately every 0.25 miles.

e. CDOT is looking at conducting a test fence which is not part of the INFRA project. They will construct 3 sections of test fence in summer 2021 (200 LF) and the test will run through next winter. It will be designed to handle heavy snow loads. CDOT

is interested in balancing cost-effectiveness with durability/longevity. This test will be very useful for informing the formal fence design for our project.

13. Next Steps

a. Mary Jo reviewed the next steps:

i. Start-up ITF meetings completed in February
ii. TT meets again in February after 1st ITF meetings completed and will review the ITF progress and assess overlap among the ITF work
iii. INFRA Grant Project Design proceeds
iv. ITF meetings to present design recommendations
v. Wildlife Crossing FOR will be in fall 2021

14. Comments Received after the Meeting

The previous meeting notes were provided by Michelle Cowardin/DNR.

Wildlife Panel Meeting
January 17, 2008
10:00 AM to 12:30 PM

Avon Library
200 Benchmark Road
Avon, CO 81620

Meeting Subject: Initial Wildlife Panel Meeting

Meeting Date: January 17, 2008

Meeting Location: Avon Library

Attendees:	Affiliation :	Attendees:	Affiliation :
Peter Kozinski	CDOT-R3	Julia Kintsch	SREP
Brian Pinkerton	CDOT-R1	Monique DiGiorgio	SREP
Gary Spinuzzi	CDOT-R3	Chris Haas	SWCA/CSU
Deb Angulski	CDOT-R1	Alison Michael	USFWS
Jeff Peterson	CDOT	Kurt Broderdorp	USFWS
Bill Andree	CDOW	Bill Ruediger	Wildlife Consulting Resources
Shannon Schwab	CDOW	Alex Pulley	Felsburg Holt & Ullevig
Tom Kroening	CDOW	Laura Archerd	Felsburg Holt & Ullevig
Melanie Woolever	USDA Forest Service	Evan Kirby	Felsburg Holt & Ullevig
Keith Giezentanner	USDA Forest Service	Linda Gann	Felsburg Holt & Ullevig
Vernon Phinney	USDA Forest Service	Steve Dole	Felsburg Holt & Ullevig
Pete Fralick	Eagle County		

Preparer: Felsburg Holt & Ullevig, Linda Gann

The members of the Panel introduced themselves, which included representatives from the USDA Forest Service, USFWS, CDOW, SREP, Eagle County, CDOT, Colorado State University, and consulting firms.

Other Concurrent Projects and Process

Peter Kozinski identified and briefly discussed the other projects as they relate to the West Vail Pass Habitat Linkage & Wildlife Overpass Project area. This includes:

- I-70 Programmatic Environmental Impact Statement (PEIS) Collaborative Effort (CE). The CE Process provides a forum to discuss and resolve issues associated with improvements on I-70. There is a commitment on the part of CDOT that what comes out of the CE Process will be the Preferred Alternative in the I-70 PEIS.
- The reconvening of the ALIVE Committee to determine if the recommendations currently in the PEIS are still correct or need to be revised.
- A brief description of the I-70 Mountain Context Sensitive Solutions (CSS) Project was also given.
- An update regarding the West Vail Pass Climbing Lanes Environmental Assessment (EA) included that it is on hold until the CE Process is completed. Peter stated that the West Vail Pass Habitat Linkage Project may be delayed until the improvements on I-70 have been identified, which is dependent on the CE Process recommendations that are expected to be completed by May/June 2008.
- There was a short discussion about new chain-up areas on WVP. These areas will be cleared under a Categorical Exclusion.

Project Background and Goals

The West Vail Pass Habitat Linkage & Wildlife Overpass Project is funded through a federal grant from the Public Lands Discretionary Funds to analyze a vegetative wildlife overpass on West Vail Pass. CDOT determined that the project limits would include the stretch of I-70 from mile marker 190 to mile marker185. These mile markers represent the top of the pass (MM 190) and the first span bridge (MM 185). This project includes reviewing collected reports and other information to identify wildlife activity and habitat preferences to determine a location for the overpass structure and to design as much of the structure as possible. The grant money will likely be able to pay for the much of the design of the structure, but at the current time, money for construction of the structure has not been identified.

Goal of the Panel

Alex Pulley encouraged the Panel to provide input on target species and the location of the overpass during the first meeting. In other meetings, design elements will be discussed.

West Vail Pass Site Description (see project area maps)

Alex discussed the general description of the project area:

- relatively dense vegetation on both sides of I-70
- Black Gore Creek parallels I-70 on the south side
- generally slopes north to south
- large span bridges on the lower portion of the Pass
- area surrounded by USFS lands (Eagles Nest Wilderness Area and management areas for Landscape Linkage and Recreation)
- higher human activity including a summer and winter (i.e. snowmobile) recreation on the upper portions of the pass.

Within the project area, a preliminary site was identified at mile marker 187.4 based on engineering feasibility. This site provides characteristics that allow for the construction of a structure with fewer difficulties than other areas of the pass because of the surrounding topography. Characteristics of this site include:

- favorable grade and elevation for bridge landing and simple approach on the north side, allowing for an easier tie in to existing land features
- a flat zone on the south side of I-70 that allows for conventional abutment, approaches, and minimizes fill slopes on the south side. The remainder of the project area on the south side has very steep slopes and would require significant earthwork to achieve natural contours from the structure.
- this flat zone also allows for the more options for the movement of the bike/pedestrian travel path
- provides a natural construction staging area that minimally disturbs resources

These features result in a structure that has a lower cost because it uses conventional structural elements, earthwork associated with tying into existing landscape features, and minimizing construction disturbances.

Information Collected and Analyzed

Several published reports and other information specific to West Vail Pass was reviewed to identify a potential site location for the overpass. These publications include:

- *A Landscape Level Inventory of Valued Ecosystem Components* (ALIVE) Report (2007)
  - Identified West Vail Pass as a linkage interference zone because of USDA Forest Service lynx linkage and landscape linkage management areas.
- *Linking Colorado's Landscapes-A Statewide Assessment of Wildlife Linkages Phase I* (2005)

- *Identifying the Best Locations Along Highways to Provide Safe Crossing Opportunities for Wildlife* (2003)
  - Performed summer and winter wildlife tracking analysis, identified crossing zones, determined landscape characteristics associated with crossing zones
- *Roads and Connectivity in Colorado: Animal-Vehicle Collisions, Wildlife Mitigation Structures, and Lynx-Roadway Interactions* (a.k.a. WUMPS) (2008)
  - Lynx roadway interaction and determined the project area is "moderate" for potential lynx highway crossing

Other information includes:

- Animal Vehicle Collision (AVC) Data (1992-2006)
  - Overall AVC data on West Vail Pass did not provide a definitive location for a structure.
  - Two lynx have been hit by vehicles on West Vail Pass. CDOW identified that the 2005 lynx roadkill was actually hit at mile marker 187.4. (*See attached revised map*).
- SREP Photo Database (2006-2007)
  - 2006 and some of 2007 data (database will be updated early 2008)
  - Generally, more photos of wildlife occurred on the north side of the I-70.
  - Mule deer and elk represented the greatest number of photos in the database.

Panel discussion items and questions regarding the SREP photo database included:

The information presented from the SREP database analysis showed 105 photos of humans. A SREP representative mentioned that a lot of human activity is associated with the transect located near mile post 184, which corresponds with a hiking trail. However, our analysis did not include this transect, and the photos of human activity were recorded at lines 1 through 6, which are located in our project area.

Mule deer activity was the greatest when compared to other species within the project area. Chris Haas asked the team about the proportion of mule deer in the upper four lines; however this type of analysis was not performed by the team. A SREP representative mentioned that they would be doing a complete analysis of the data in the spring 2008 and will share the results with the team.

A CSU representative clarified that the camera lines are site-specific and that they are not set-up to generalize activity by ½ mile increments, as was displayed in the Photo Database handout (*Grouped Tenth-Mile Zones by Photo Transect, Wildlife Photos Per Monitoring Days by Transect, and Number of Wildlife Photos by Photo Transect*).

- GIS Information

A zonal analysis for characteristics of the project area every 0.1 miles was performed using GIS. The following measures were briefly described to give the panel a basis for the discussion of the data:

- Physical and habitat characteristics (distance to vegetative cover, slope, visual cues, presence of drainages perpendicular to Black Gore Creek, and presence of other water features)
- Roadway characteristics (accident information, median barriers, guard rails, retaining walls)
- Human usage (human activity, summer recreation trails, winter recreation trails)

A SREP representative asked the team about the meaning of the *Visual Cues* map analysis. The team explained that the analysis helps identify safety issues in the corridor.

Panel Discussion

General information:

- Should consider driver expectancy as a factor—a driver should be able to see through the overpass to the other side of the structure. In other words, having a structure on a curve, the driver's sight distance is reduced.
- Should consider shade issues as a factor—as it relates to safety by increasing icing effects.
- Should consider areas that minimize conflicts with recreational activities
- Should consider the ridgeline to the south as a landscape feature that creates a natural funnel for wildlife movement.
- Should consider the I-70 improvements associated with the I-70 PEIS and West Vail Pass Climbing Lanes.

Discussion Item: Target Species

After a discussion of wildlife species located on Vail Pass, 11 target species were identified. The target species were identified for their habitat/crossing characteristics that might affect the characteristics of structure, but also for the pre- and post-construction monitoring. Target Species for project area:

- Elk
- Mule Deer
- Bighorn Sheep
- Mountain Goat
- Moose
- Black Bear
- Lynx
- Coyote
- American Marten
- Marmot
- Snowshoe Hare

A USDA Forest Service representative mentioned to the team that including Bighorn sheep and mountain goat as target species affects the placement of the overpass structure. A CDOW representative mentioned that both of these species cross throughout the project area, but are usually found near the cliffs/narrows, closer to mile marker 186.4. Discussion followed about fencing design to accommodate this broader array of species.

Discussion Item: Location

The site at mile marker 187.4 was discussed as a potential structure location. A USDA Forest Service representative recommended another possible alternative location at mile marker 188.5, which is closer to the top of the pass.

- A CSU Representative asked if any other locations were identified. It was also cautioned about including excessive fencing because this could create a greater barrier if animals are already successfully crossing in the area. Consider a phased approach with fencing (i.e. adaptive management).
- SREP cautioned about constructing a structure narrower in width than Banff.
- The Forest Service expressed concerns about maintenance and construction of fencing. The Forest Service would like to have an agreement with CDOT about maintenance needs and responsibility of the fences.
- CDOW recommended fencing closer to the highway because of easier access and maintenance.

The following characteristics about mile marker 187.4 were discussed and considered:

Supportive considerations:

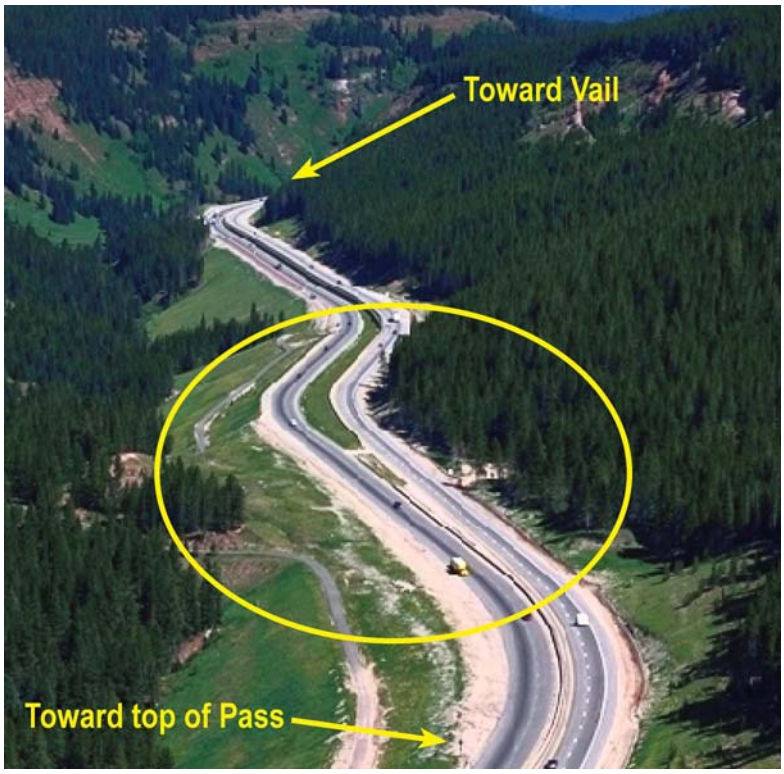
- The management of the area as a landscape linkage
- The lack of human use (recreational)
- General terrain features on the south side of the pass lead animals to general area (natural funneling effect)
- A natural drainage to Black Gore Creek occurs in the area

- Site is shown to have relatively high wildlife activity (Sarah Barnum Crossing Zones and high number of wildlife photos).
- Target species use
- Suitable engineering characteristics
- The physical nature of the site allows for engineering adjustments that would not have significant effects to wildlife usage of the structure.

Non-supportive considerations:

- Trail location and use could be an issue

After discussion, the consensus from the panel is mile marker 187.4 is the selected location for the overpass structure because of the engineering characteristics of the site and the wildlife use of the site appears to be high in that area.



**Approximate location for structure.*

Next Phase

The project will move into the design phase which includes the following design criteria that affect the wildlife usage of the structure:

- Width of the structure
- Depth of the structure
- Fencing requirements
- Preliminary layouts

An initial discussion regarding fencing requirements identified that the extent of fencing from the structure, the location of the fencing in relation to the edge of I-70, how the trail will align with the fencing, and the strength of the fencing were the initial issues to be further discussed by the Wildlife Panel. Additionally, the cost and maintenance of the fencing will be critical to resolve.

The Wildlife Panel will reconvene in the same format to discuss identified design criteria suitable for target species. A smaller subgroup was briefly discussed. Further information regarding the next phase will be forthcoming.

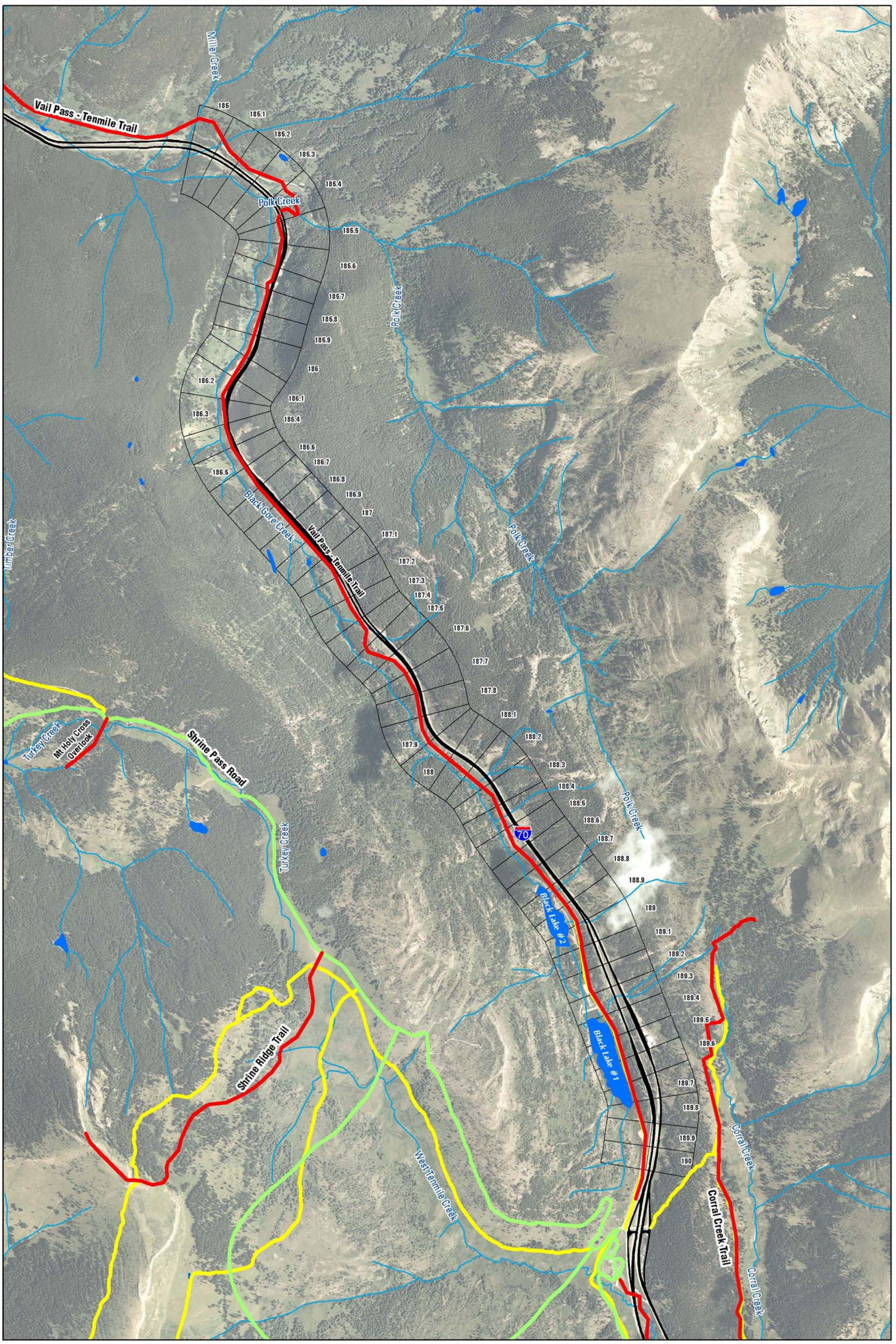
Action Items:

☒ Completed Action Item
- Check for accurate lynx/vehicle collision location

☐ Completed Action Item
-

☐ Completed Action Item
-

This is an understanding of the proceedings of this meeting. If you have any additions or changes, please contact the meeting preparer within two weeks of receipt. After that date, these minutes will be entered into the data system.



Legend

- White River National Forest Trails
- Vail Pass Designated Snowmobile Trails
- Vail Pass Recreation Cross Country Trails
- Streams

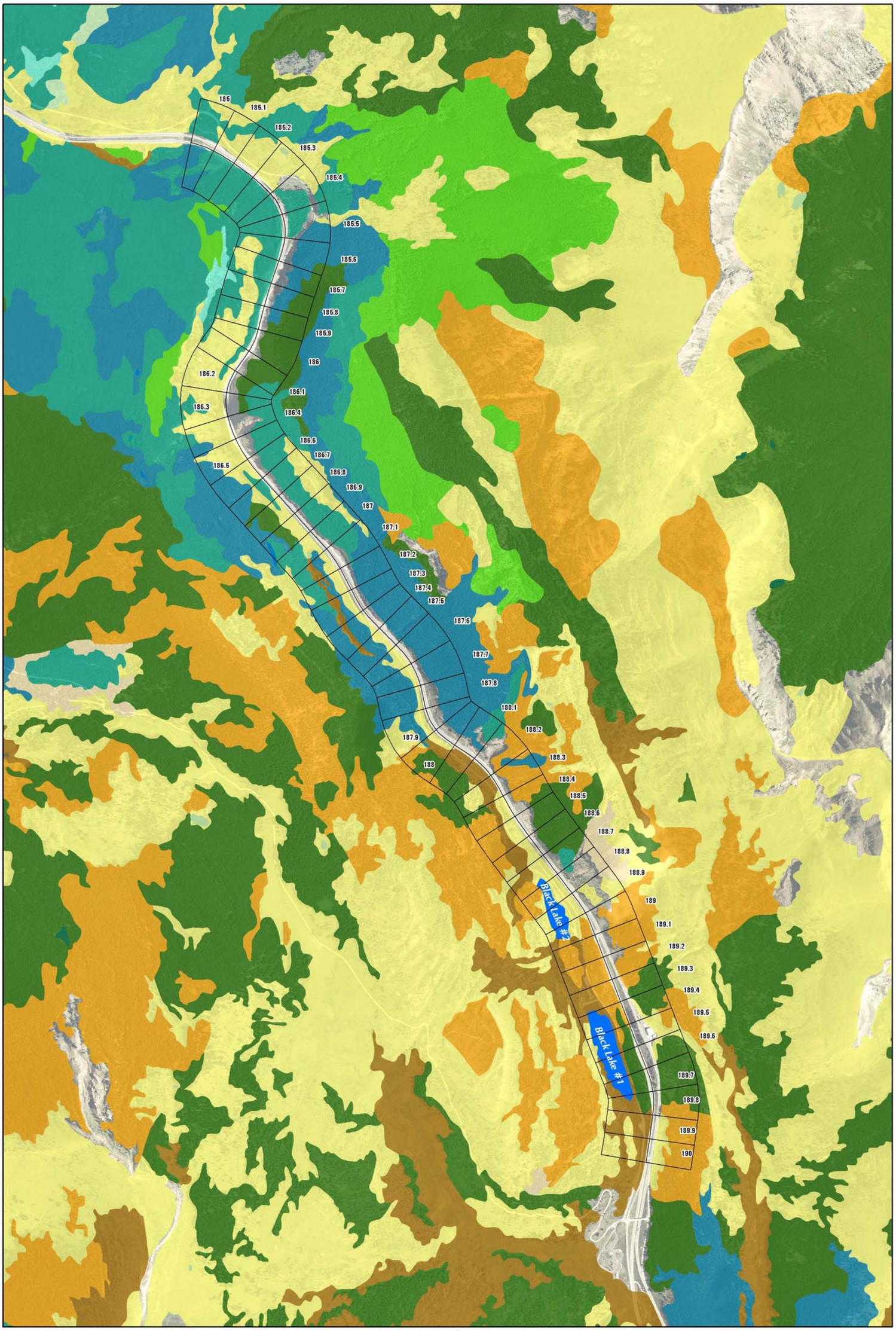
NORTH

2,000 0 2,000 Feet

SCALE - 1:24,000 or 1" = 2,000'

West Vail Pass Habitat Linkage

White River National Forest Trails



LEGEND

- aspen
- aspen with conifer
- engelmann spruce
- engelmann spruce mixed
- grass/forb
- lodgepole pine
- lodgepole pine mixed
- shrub
- spruce/fir
- spruce/fir mixed
- water
- willow

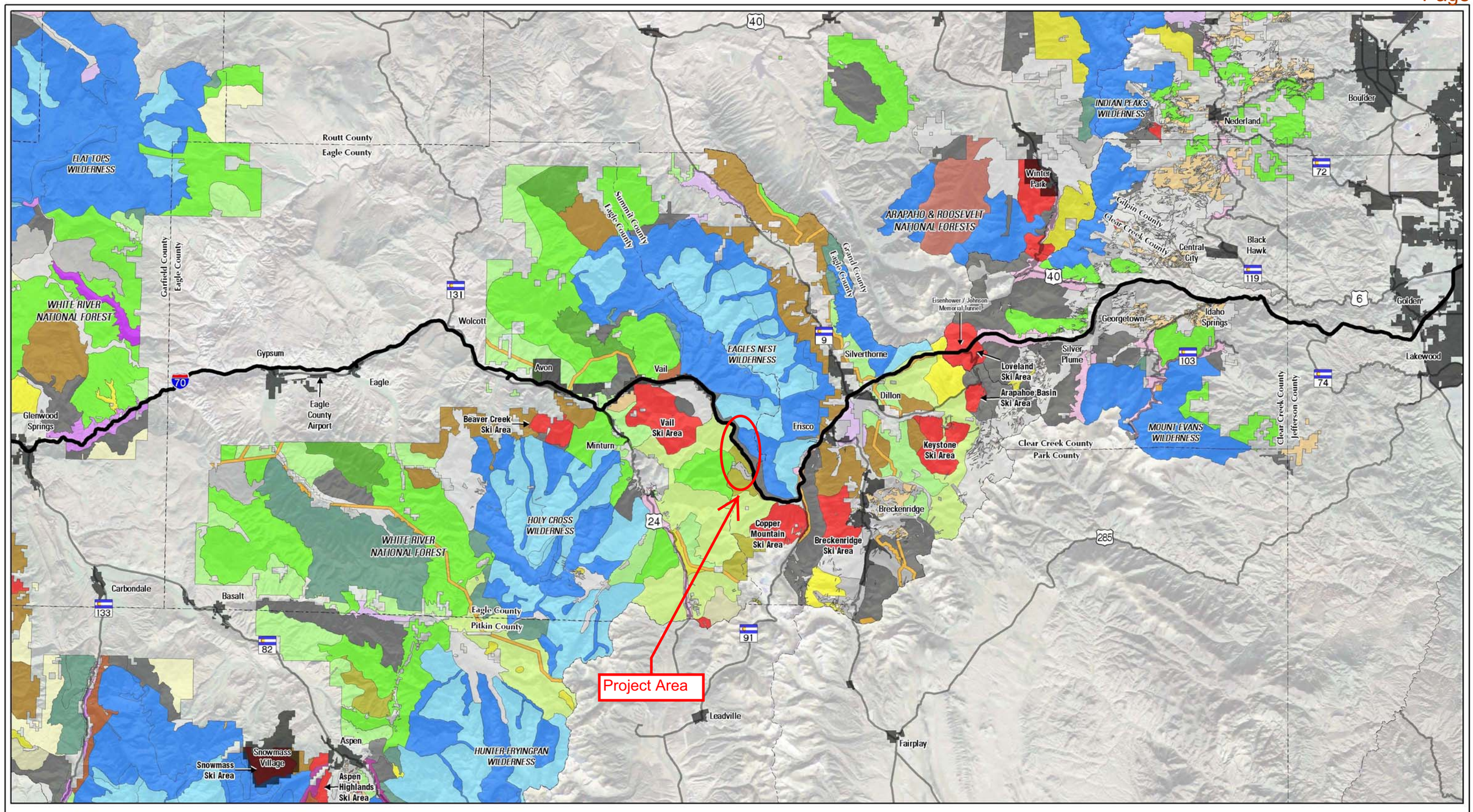
NORTH

2,000 0 2,000 Feet

SCALE - 1:24,000 or 1" = 2,000'

West Vail Pass Habitat Linkage

White River National Forest
Vegetation Classification



LEGEND

Forest Management Prescriptions

- Backcountry Rec (Limited Winter Motorized)
- Backcountry Rec (Non-Motorized w/ Winter Motorized)
- Backcountry Rec (Non-Motorized)
- Backcountry Rec (Year-Round Motorized)
- Bighorn Sheep Habitat
- Deer and Elk Winter Range
- Designated Utility Corridors
- Developed Recreation Complexes
- Dispersed Recreation
- Dispersed Recreation (High Use)
- Elk Habitat
- Forest Carnivores
- Forested Flora and Fauna Habitats
- General Forest and Rangelands
- National Forest-Residential Intermix
- Primitive Wilderness
- Pristine Wilderness
- Recommended Wilderness
- Recreation Rivers (Designated and Eligible)
- Research Natural Areas
- Wild Rivers (designated and eligible)
- Resource Production (Forest Products)
- Scenic Byways (Areas, Vistas or Travel Corridors)
- Scenic Rivers (Designated and Eligible)
- Ski Based Resorts (Existing and Potential)
- Special Interest Areas (Emphasis on Use or Interpretation)
- Special Interest Areas (Minimal Use or Interpretation)

NORTH

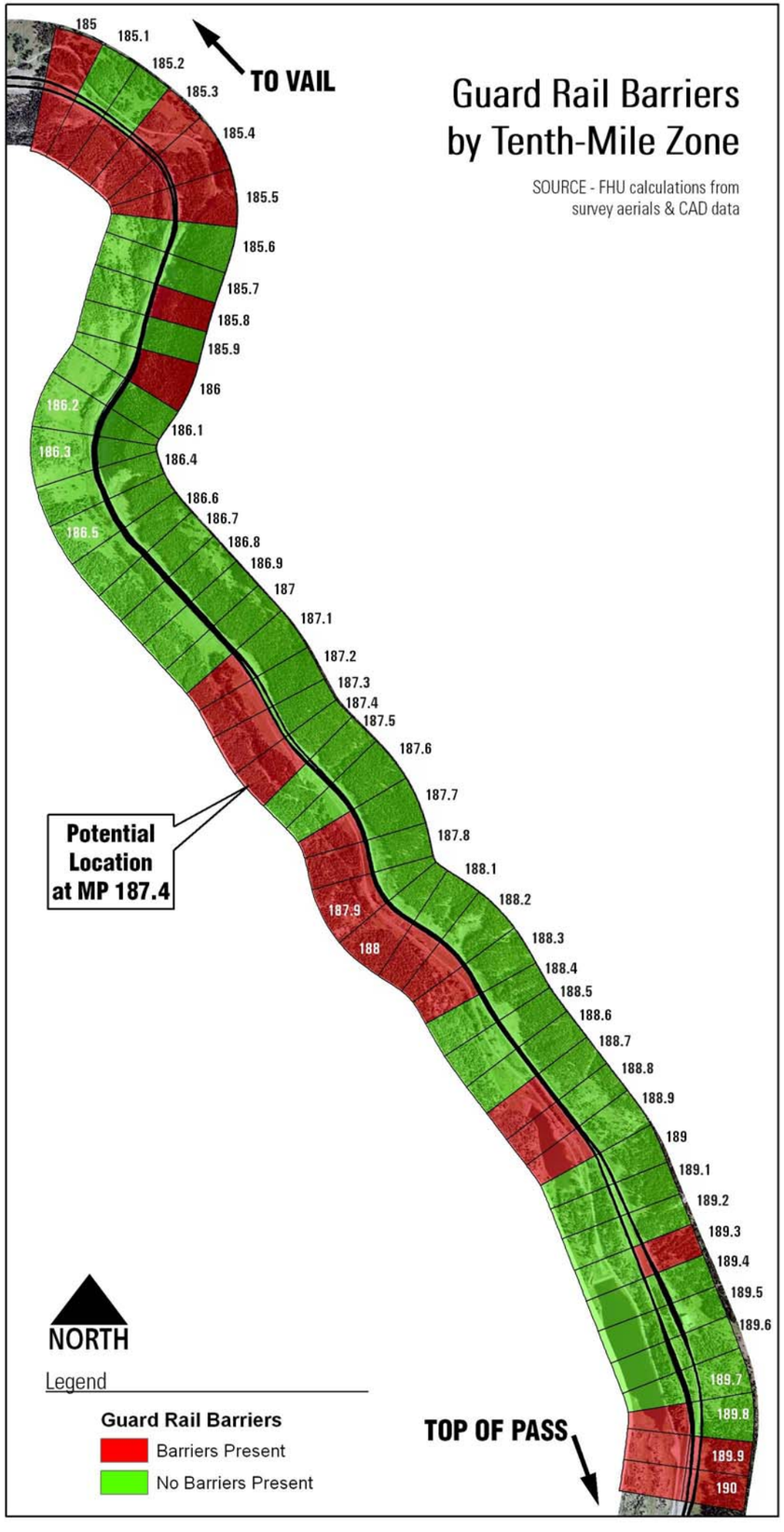
0 5 10 Miles

West Vail Pass Habitat Linkage

Arapaho & Roosevelt and White River National Forest Management Prescriptions

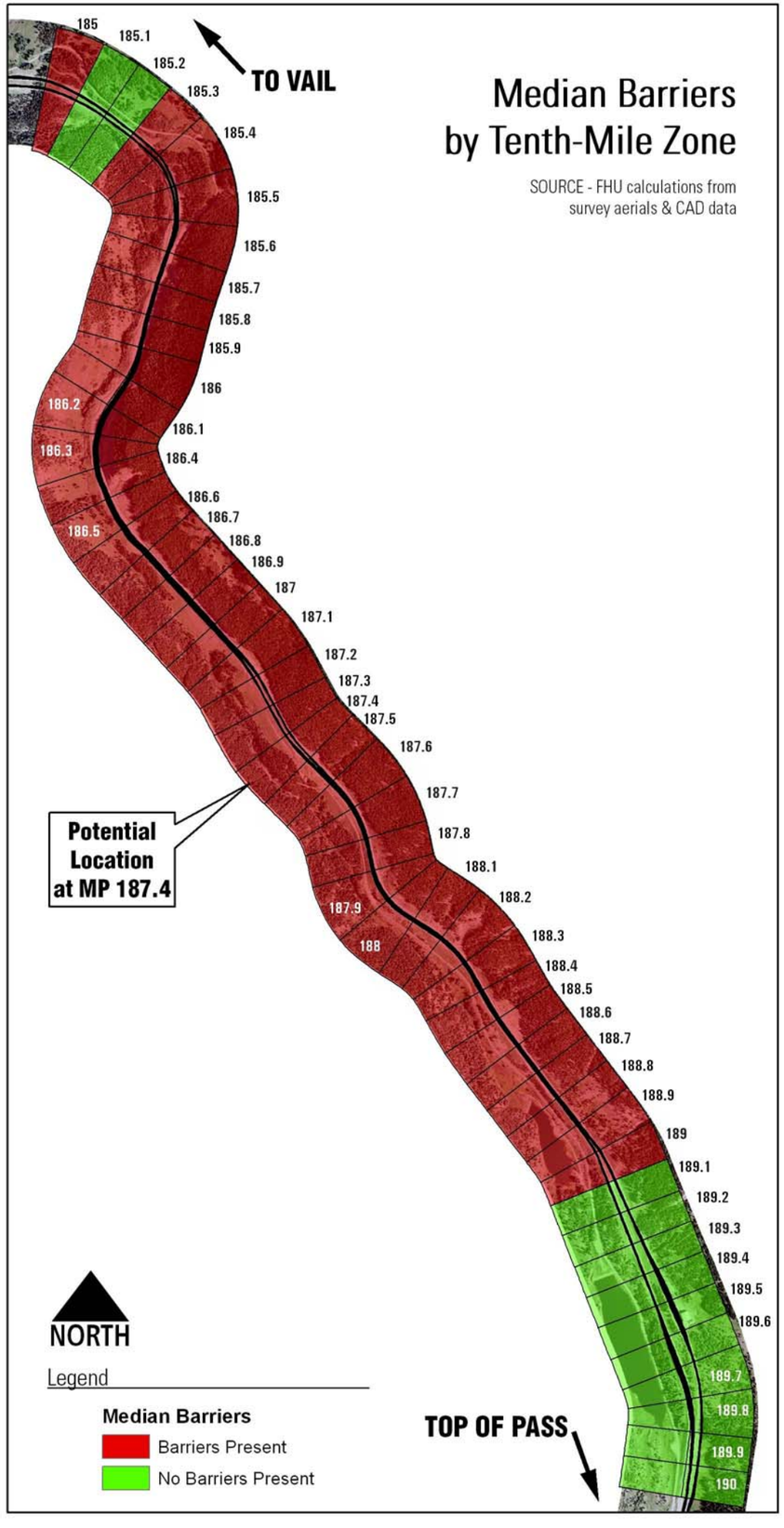
Guard Rail Barriers by Tenth-Mile Zone

SOURCE - FHU calculations from survey aerials & CAD data



Median Barriers by Tenth-Mile Zone

SOURCE - FHU calculations from survey aerials & CAD data

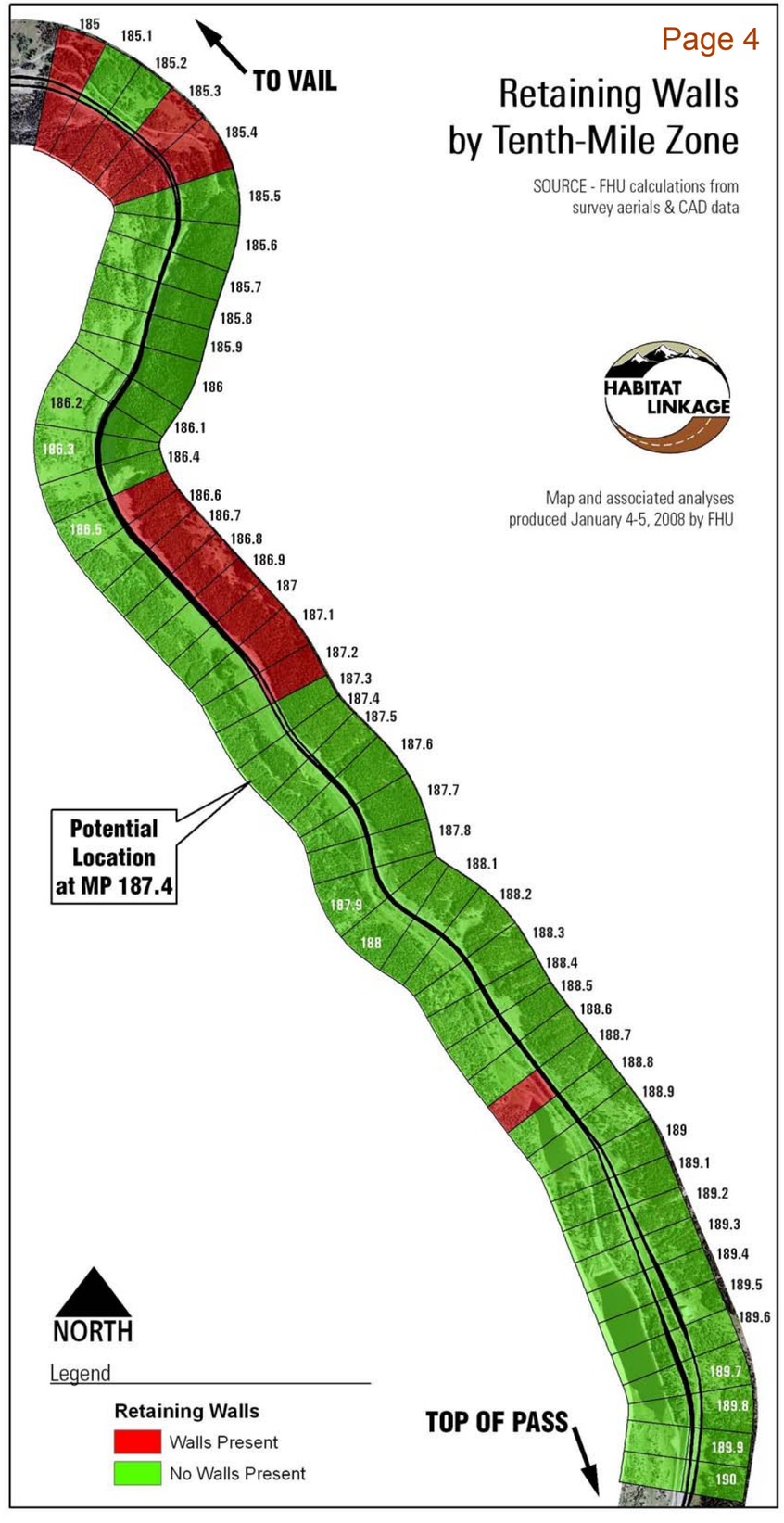


Retaining Walls by Tenth-Mile Zone

SOURCE - FHU calculations from survey aerials & CAD data

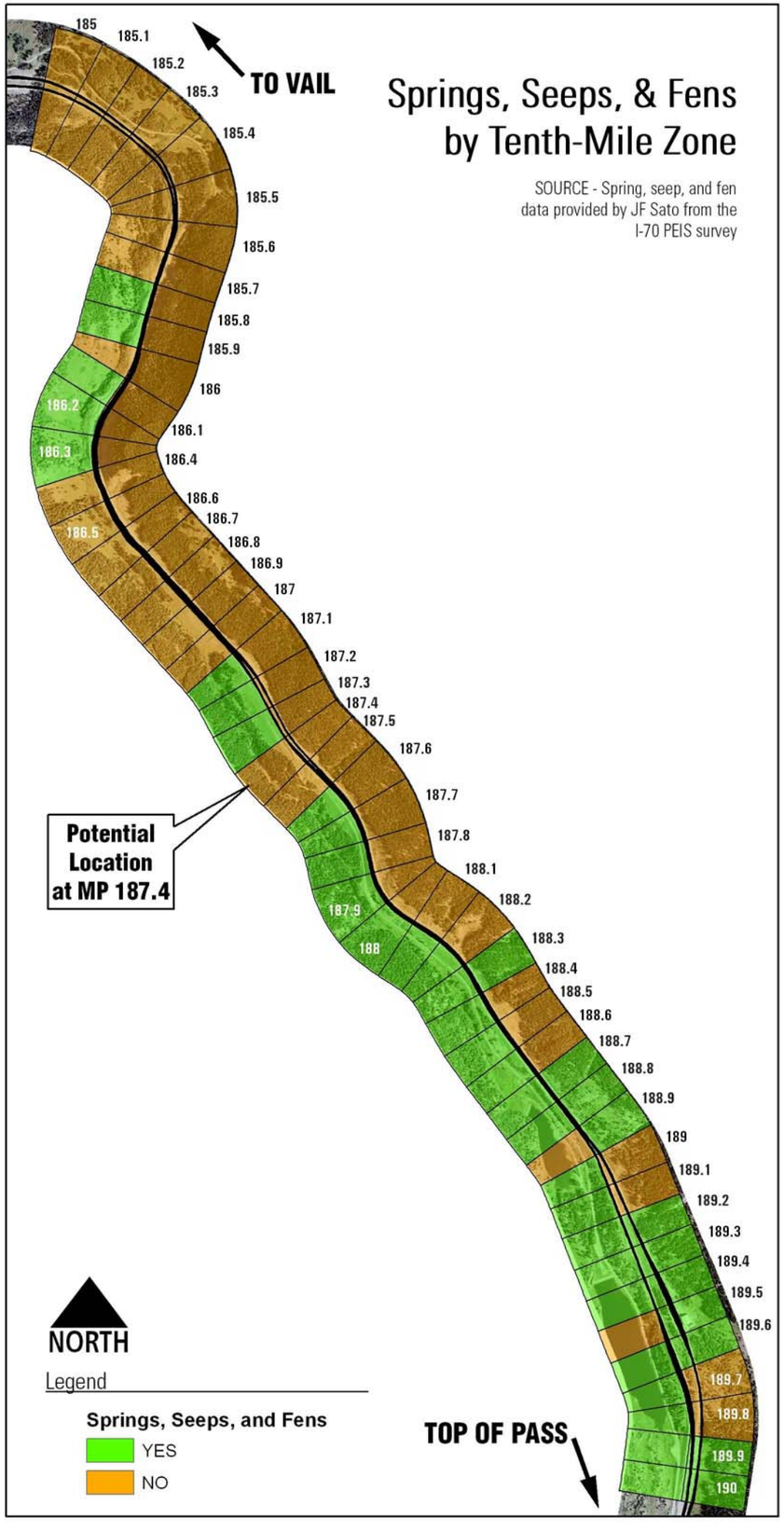
HABITAT LINKAGE

Map and associated analyses produced January 4-5, 2008 by FHU



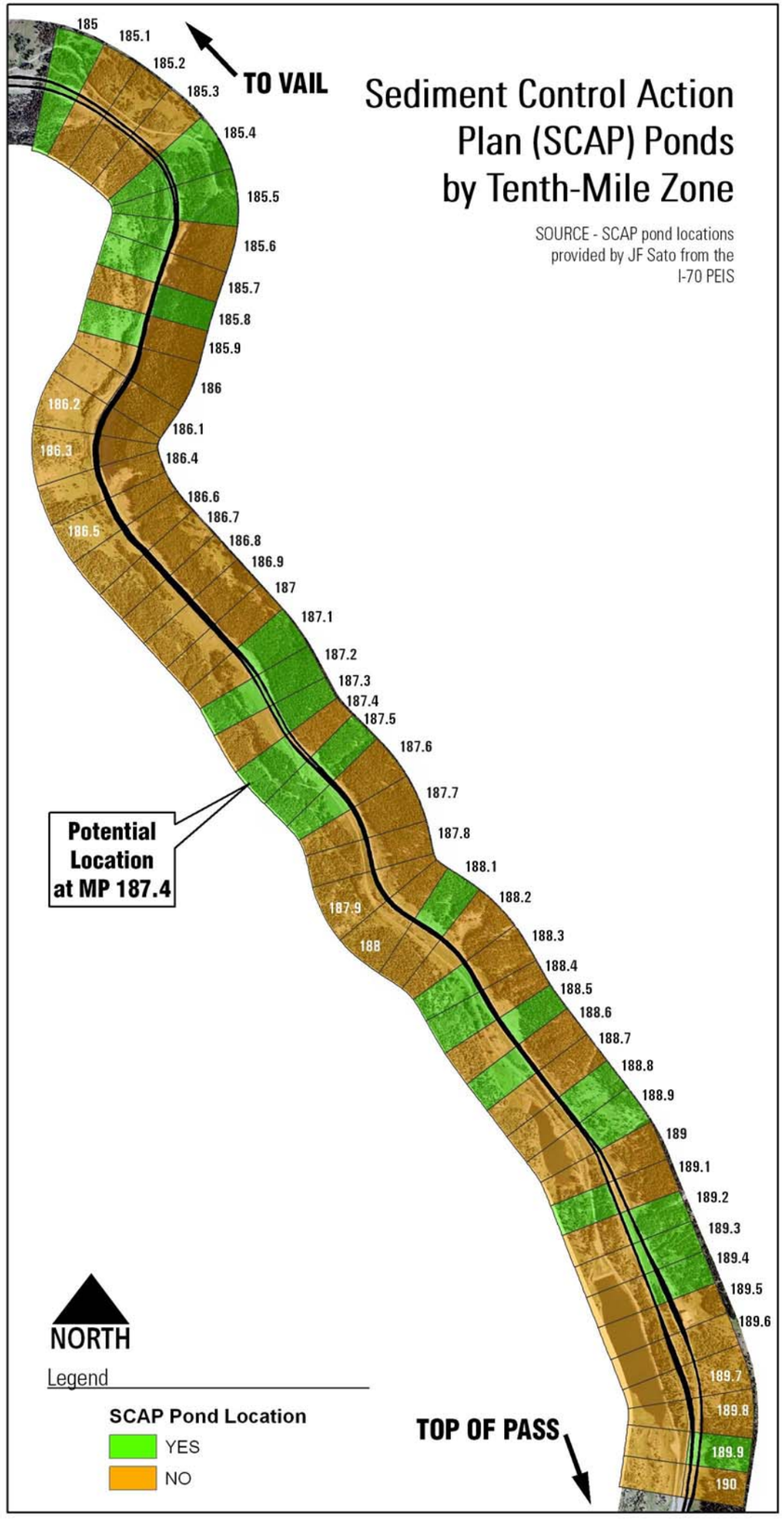
Springs, Seeps, & Fens by Tenth-Mile Zone

SOURCE - Spring, seep, and fen data provided by JF Sato from the I-70 PEIS survey



Sediment Control Action Plan (SCAP) Ponds by Tenth-Mile Zone

SOURCE - SCAP pond locations provided by JF Sato from the I-70 PEIS

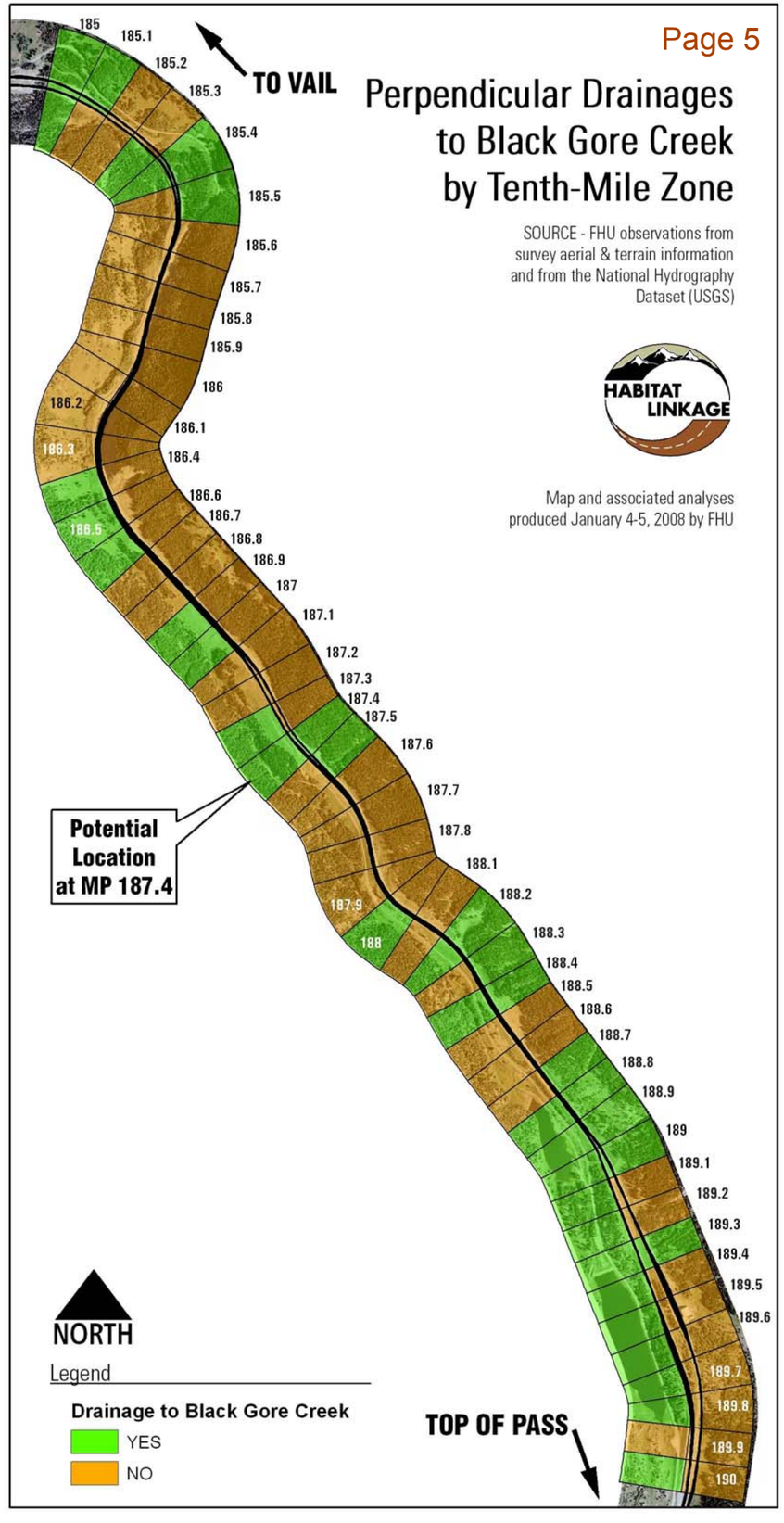


Perpendicular Drainages to Black Gore Creek by Tenth-Mile Zone

SOURCE - FHU observations from survey aerial & terrain information and from the National Hydrography Dataset (USGS)

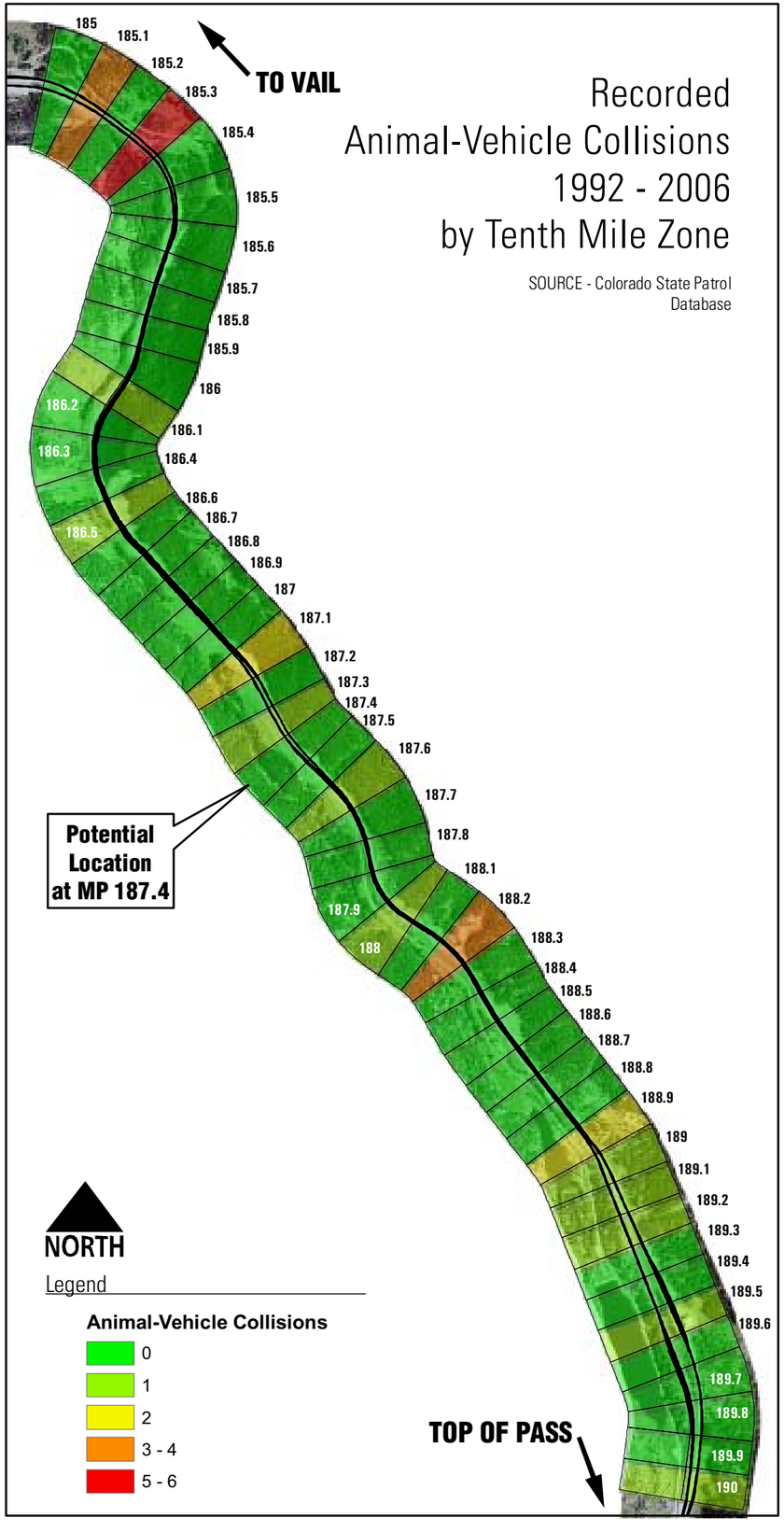
HABITAT LINKAGE

Map and associated analyses produced January 4-5, 2008 by FHU



Recorded Animal-Vehicle Collisions 1992 - 2006 by Tenth Mile Zone

SOURCE - Colorado State Patrol Database



Lynx-Vehicle Collision Locations by Tenth-Mile Zone

SOURCE - Lynx roadkill locations provided by and checked by the CDOW, USDA-Forest Service, SREP and USFWS

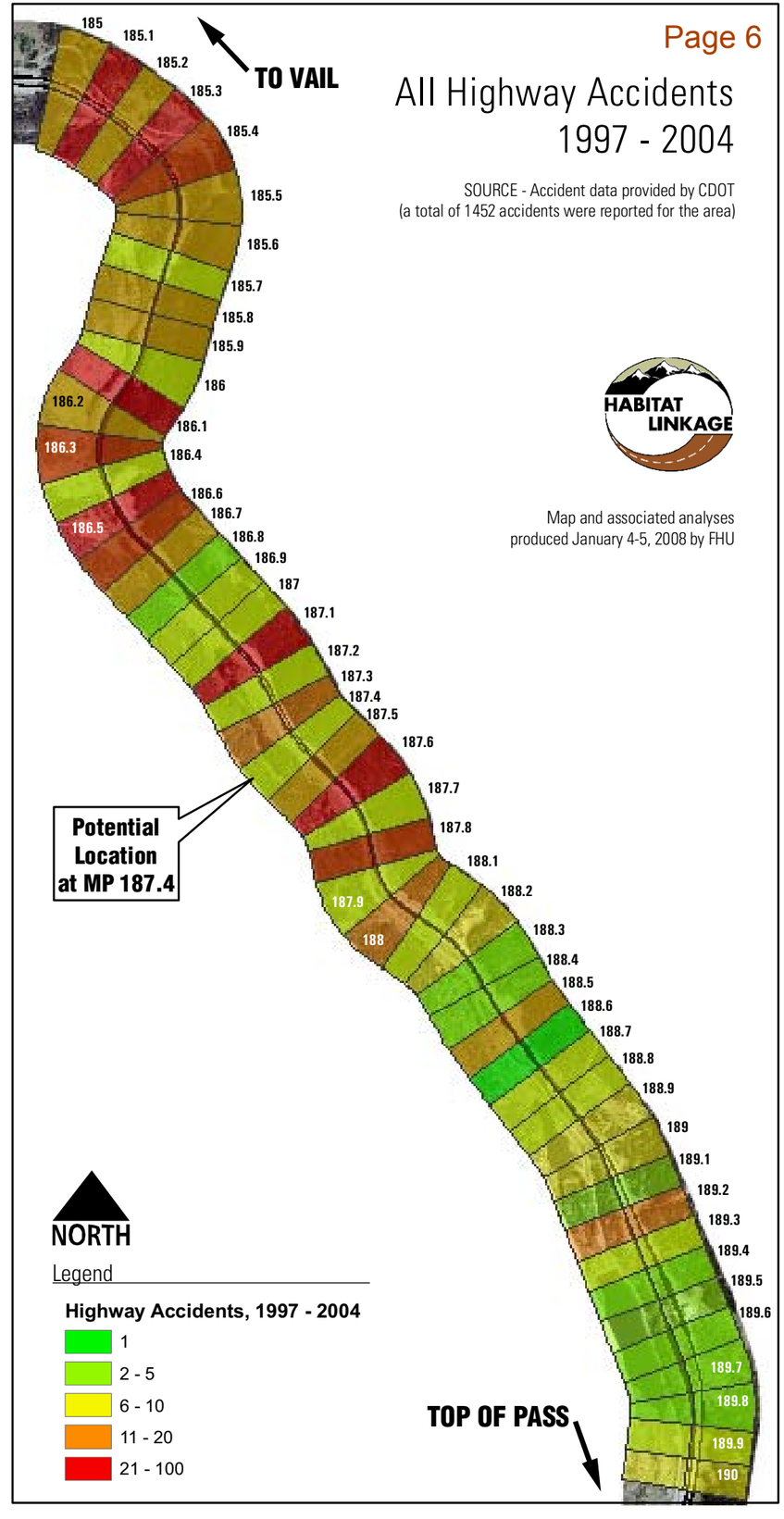
May 17th 2004, Lynx photographed by staff with White River National Forest, Taken on the north side of highway looking south toward berm.

All Highway Accidents 1997 - 2004

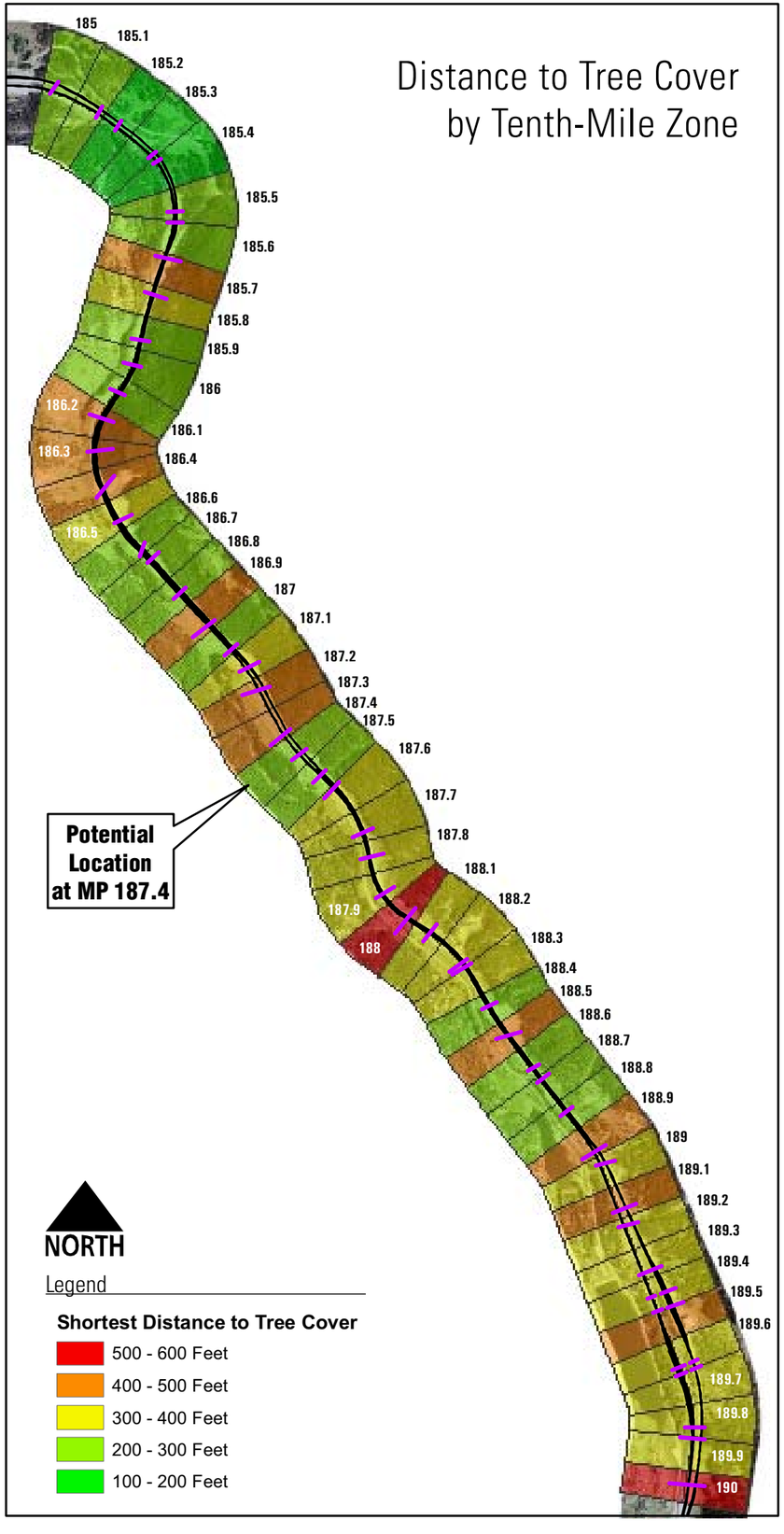
SOURCE - Accident data provided by CDOT (a total of 1452 accidents were reported for the area)

HABITAT LINKAGE

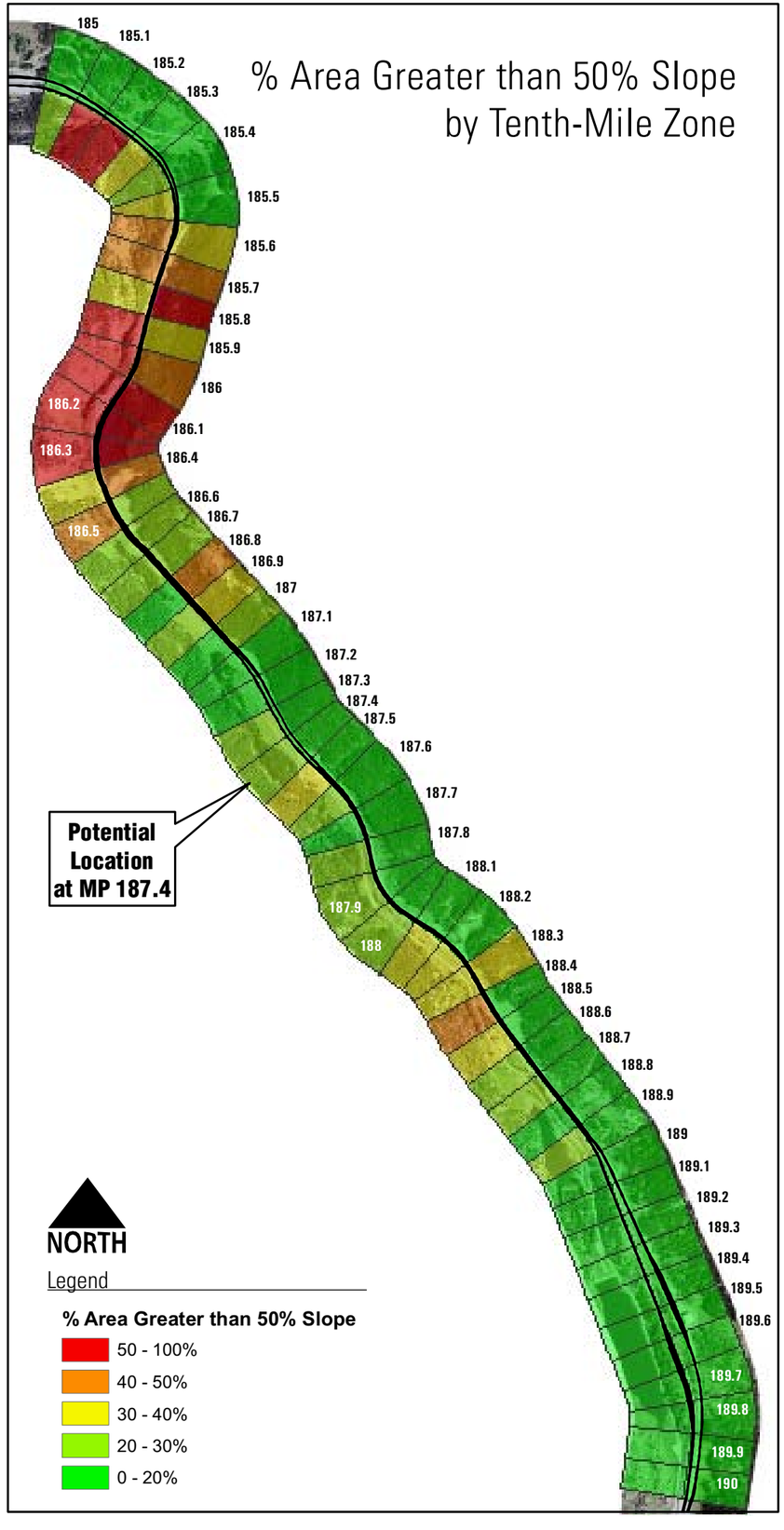
Map and associated analyses produced January 4-5, 2008 by FHU



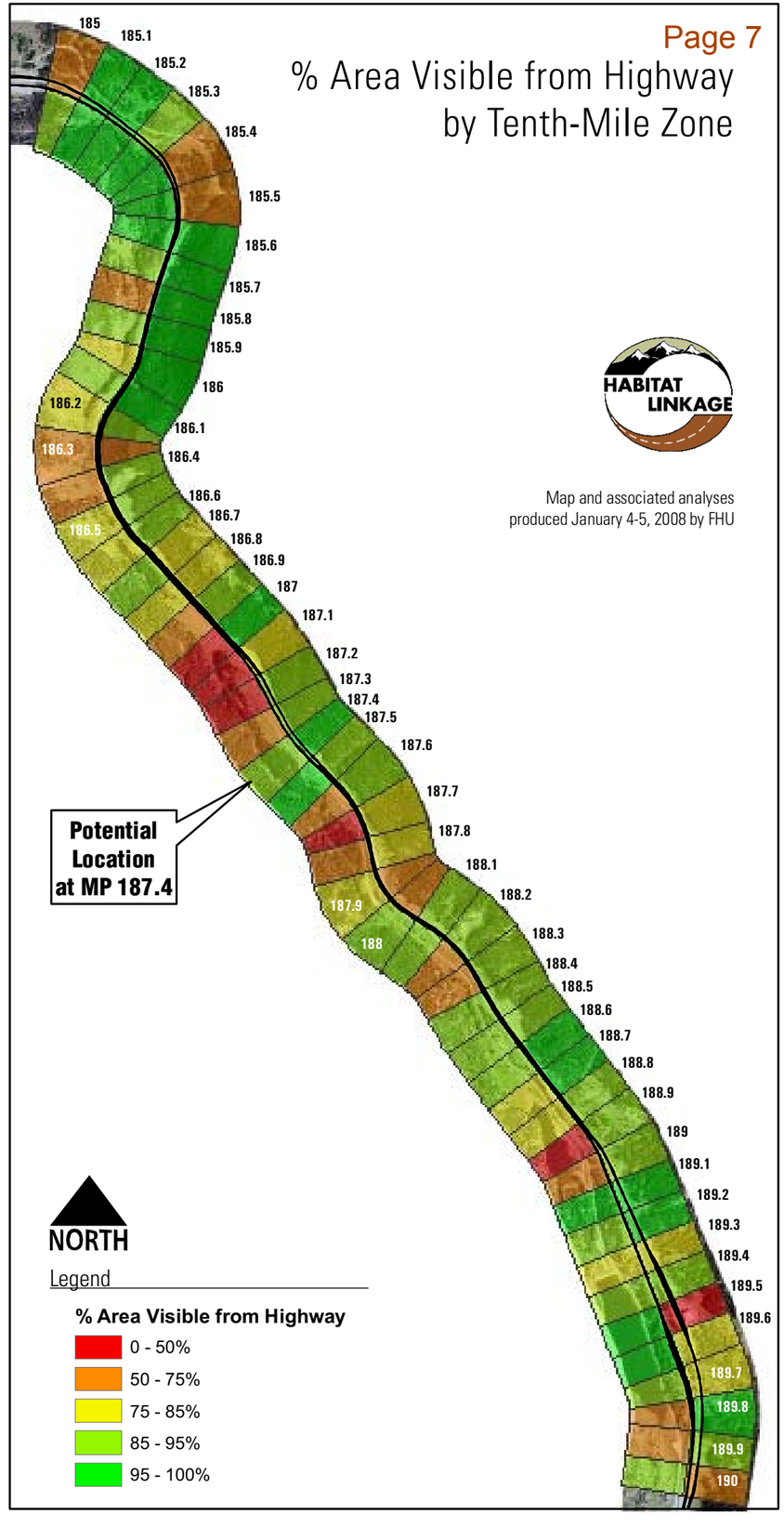
Distance to Tree Cover by Tenth-Mile Zone



% Area Greater than 50% Slope by Tenth-Mile Zone



% Area Visible from Highway by Tenth-Mile Zone

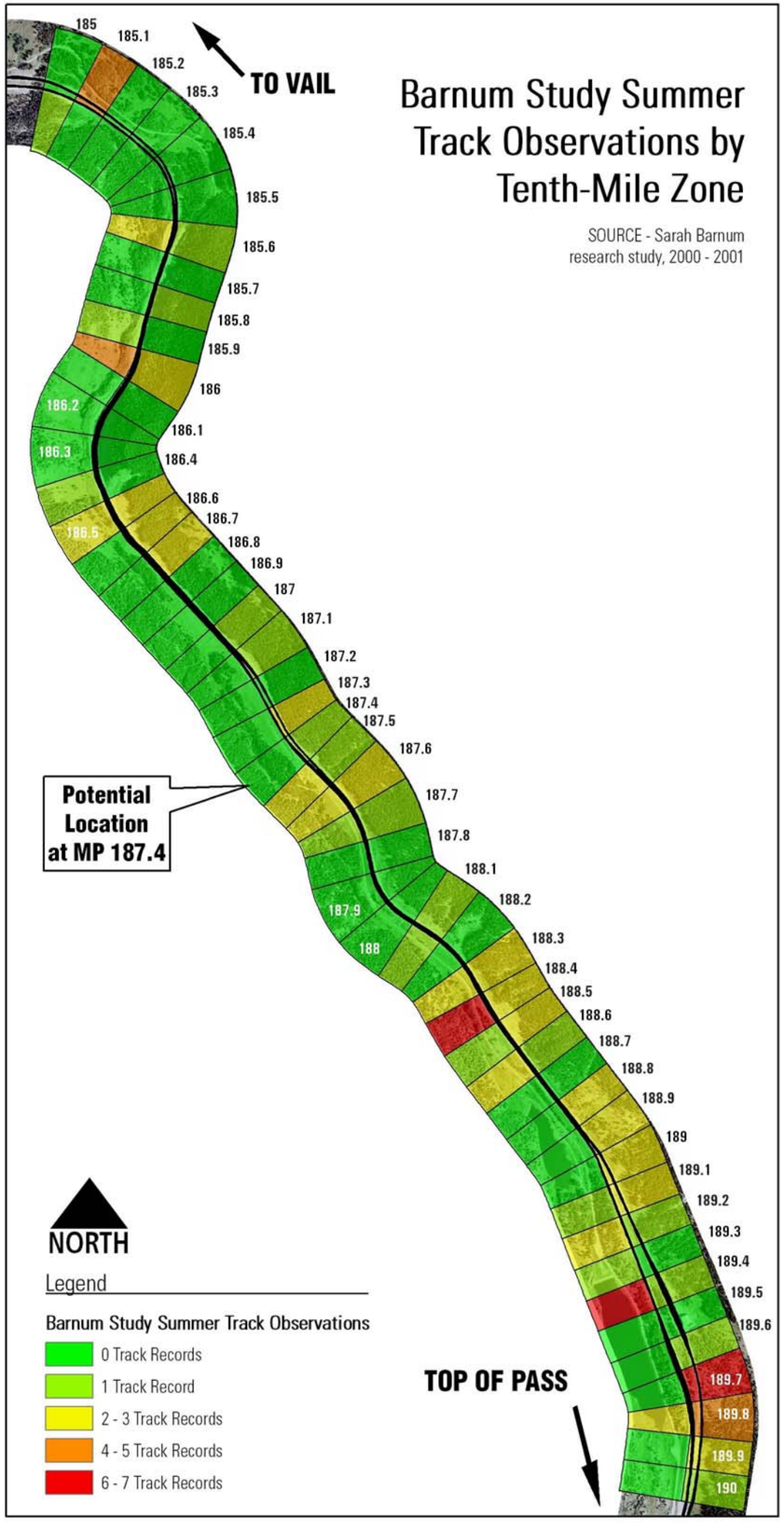


HABITAT LINKAGE

Map and associated analyses produced January 4-5, 2008 by FHU

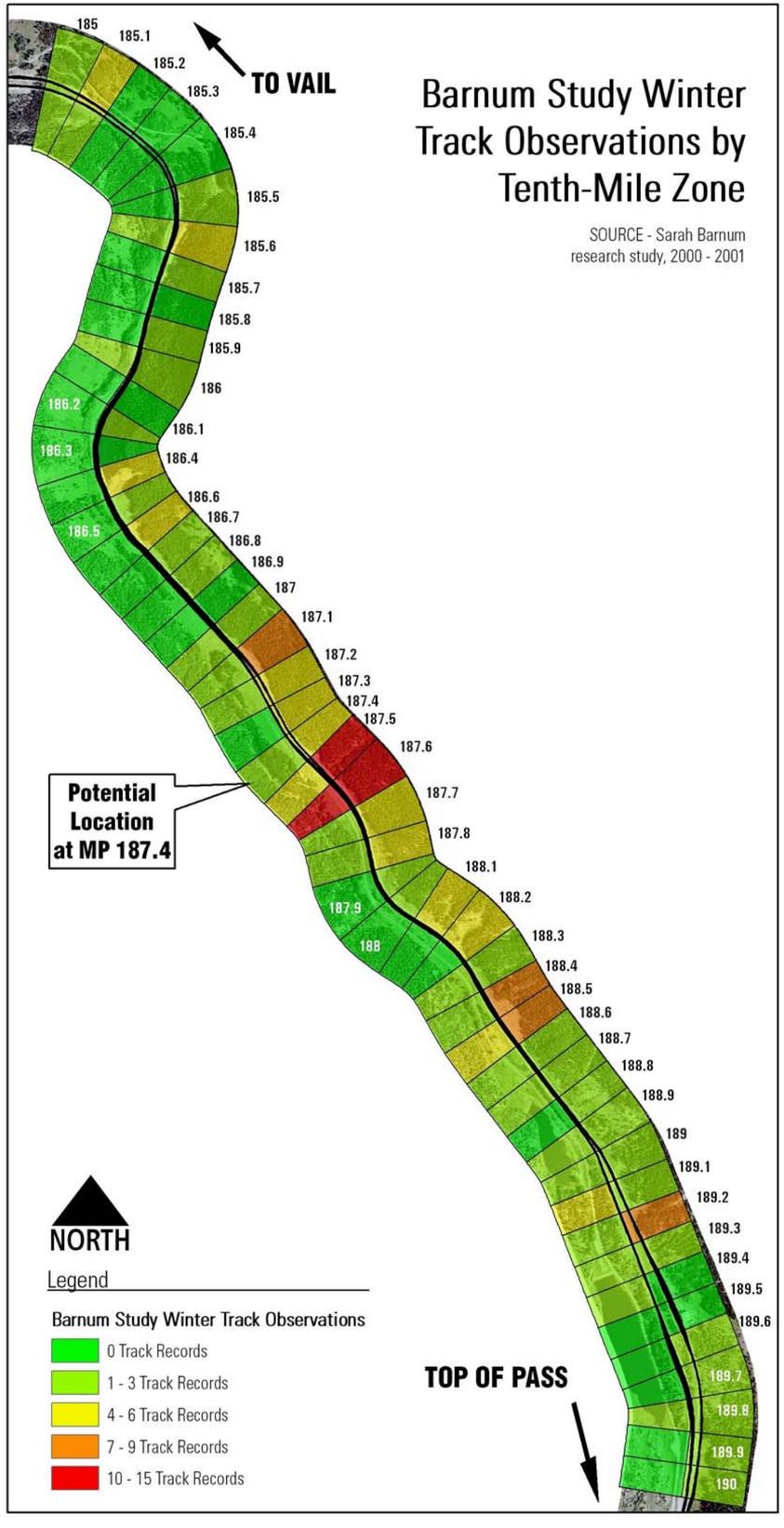
Barnum Study Summer Track Observations by Tenth-Mile Zone

SOURCE - Sarah Barnum
research study, 2000 - 2001



Barnum Study Winter Track Observations by Tenth-Mile Zone

SOURCE - Sarah Barnum
research study, 2000 - 2001

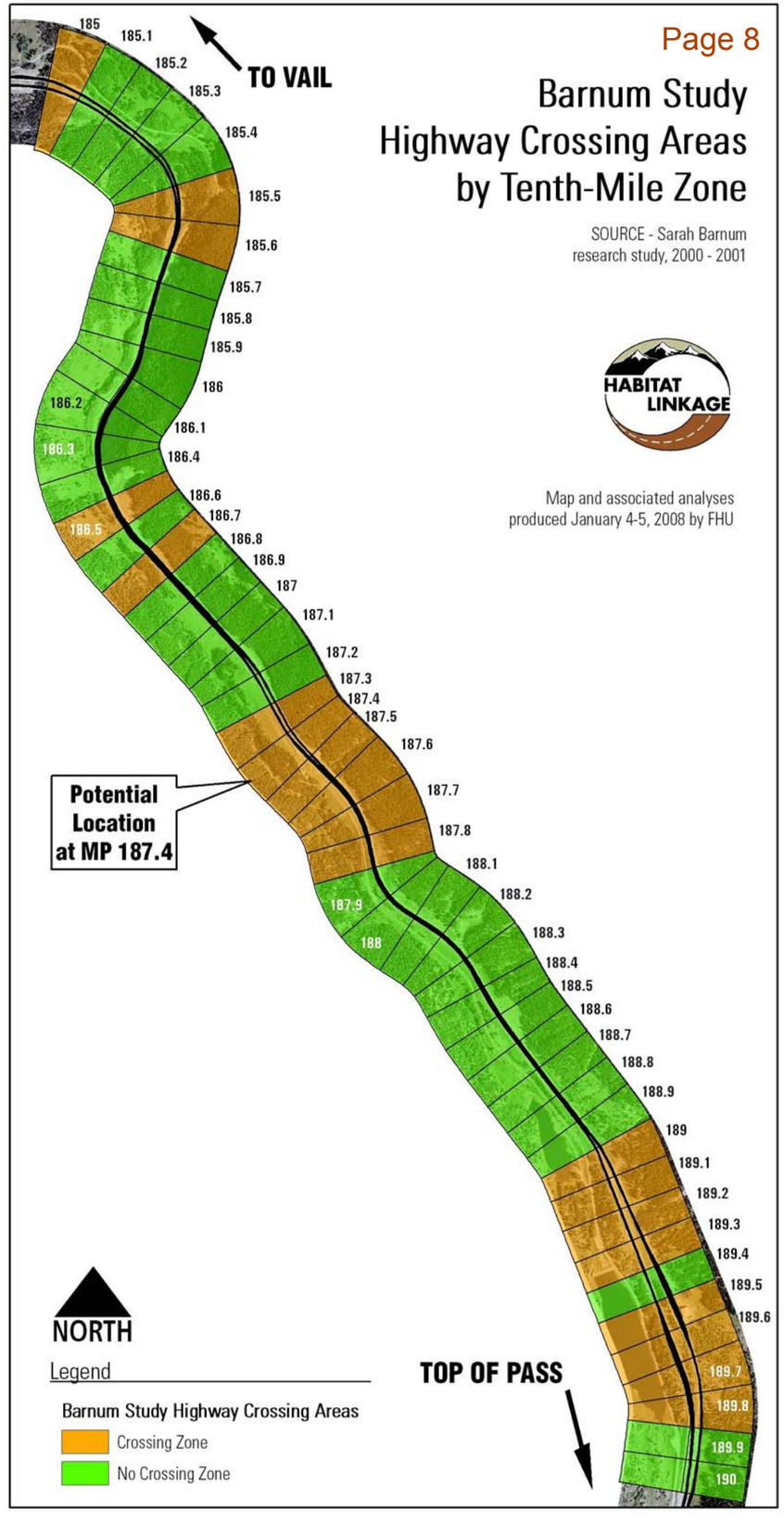


Barnum Study Highway Crossing Areas by Tenth-Mile Zone

SOURCE - Sarah Barnum
research study, 2000 - 2001

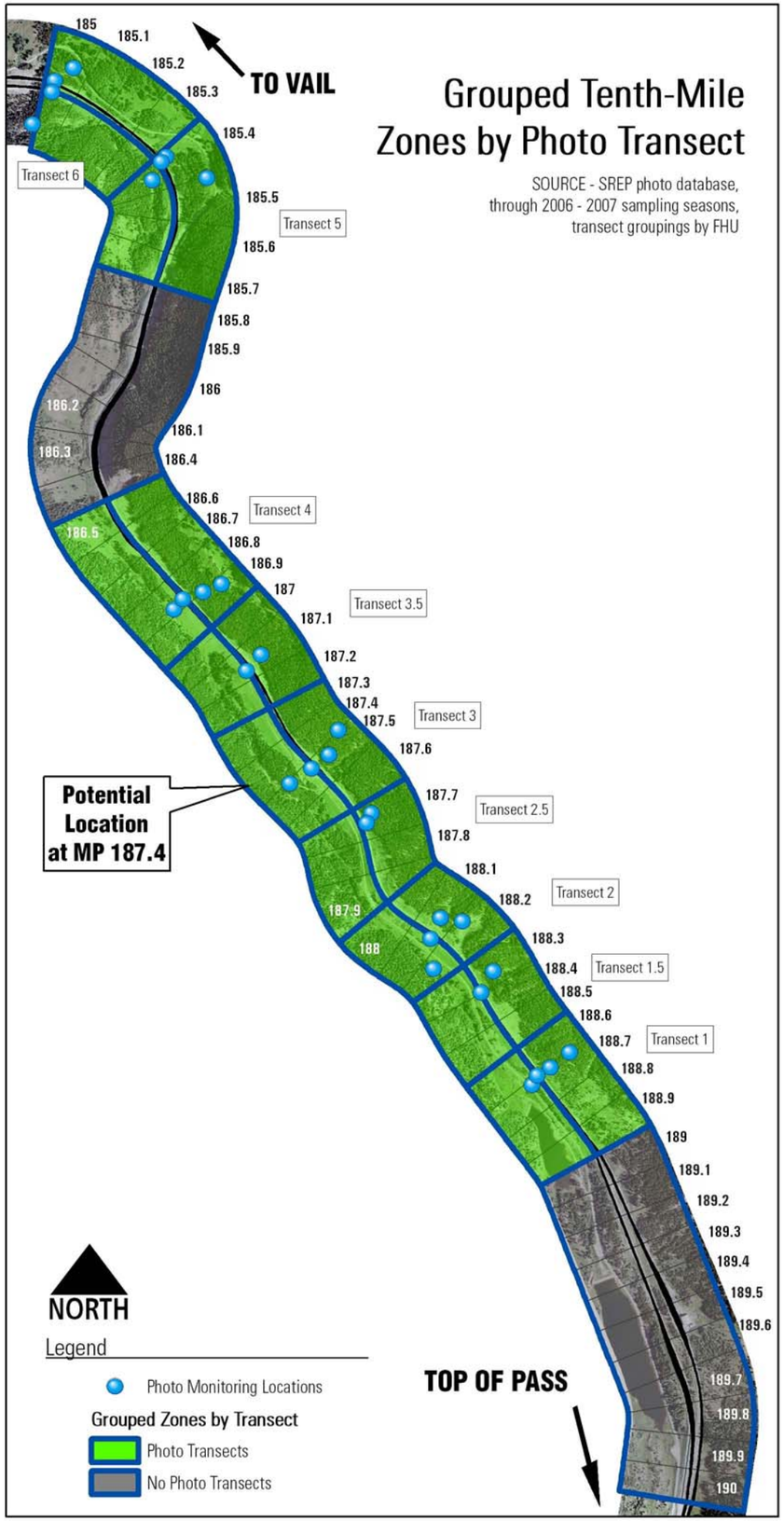
HABITAT LINKAGE

Map and associated analyses
produced January 4-5, 2008 by FHU



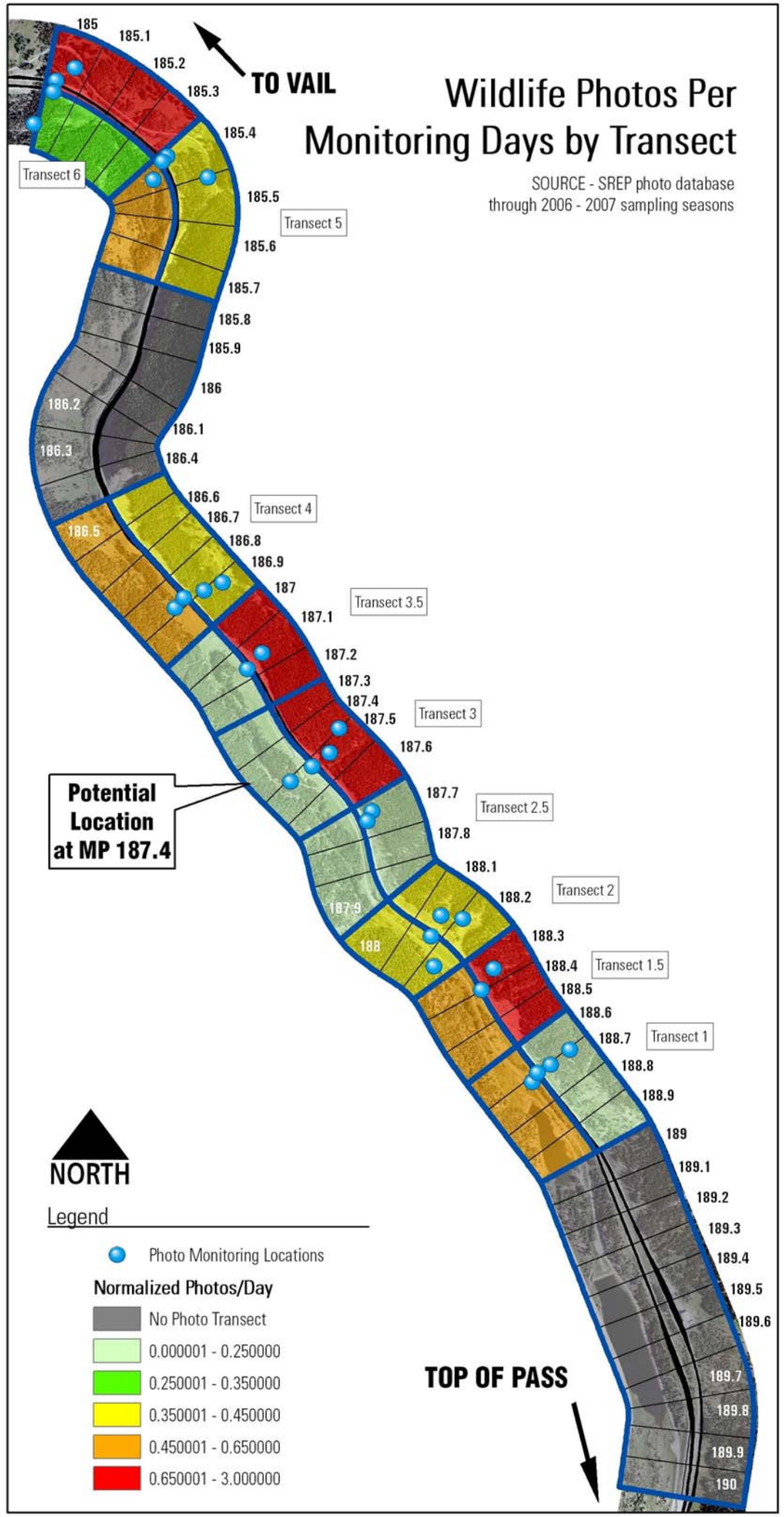
Grouped Tenth-Mile Zones by Photo Transect

SOURCE - SREP photo database, through 2006 - 2007 sampling seasons, transect groupings by FHU



Wildlife Photos Per Monitoring Days by Transect

SOURCE - SREP photo database through 2006 - 2007 sampling seasons

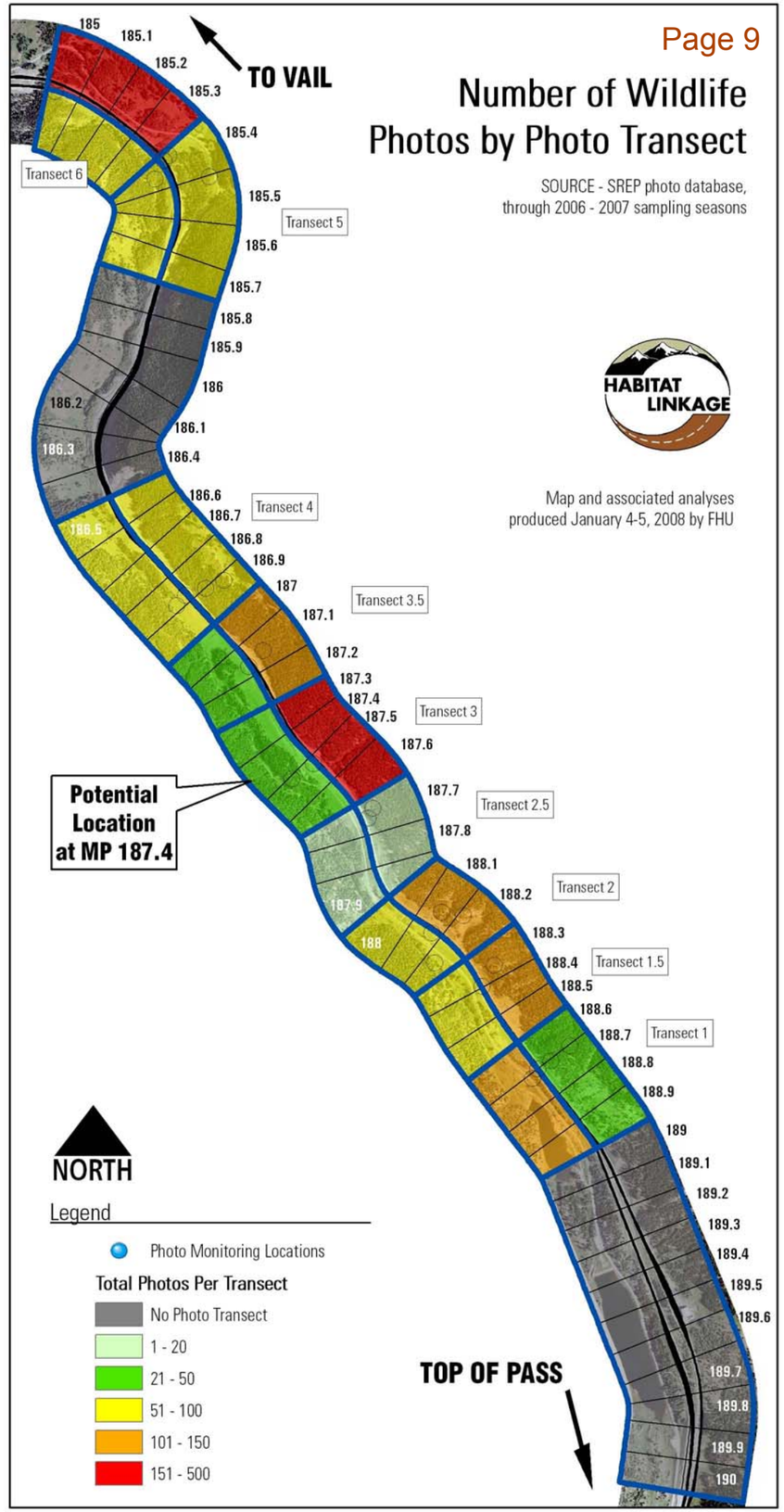


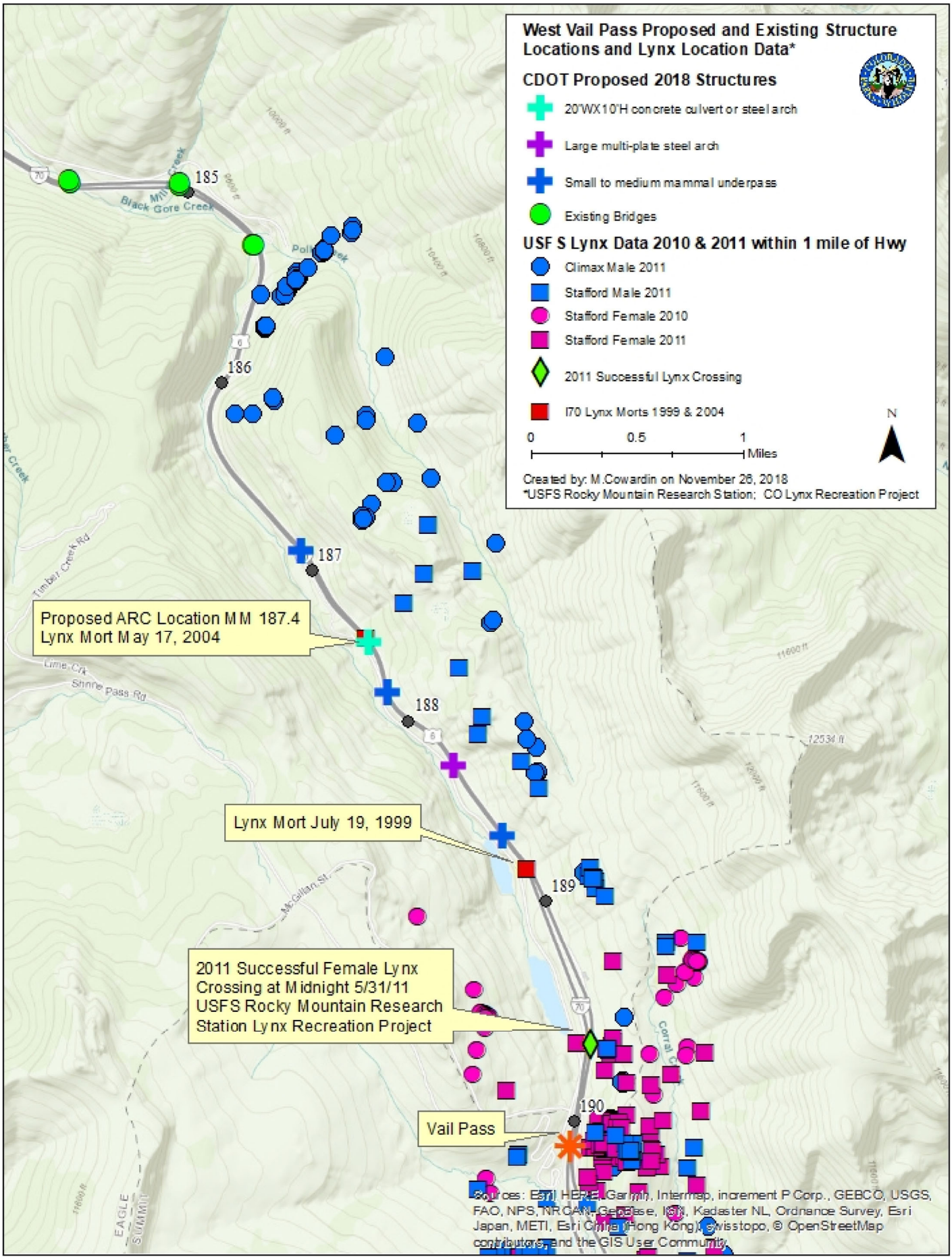
Number of Wildlife Photos by Photo Transect

SOURCE - SREP photo database, through 2006 - 2007 sampling seasons

HABITAT LINKAGE

Map and associated analyses produced January 4-5, 2008 by FHU




West Vail Pass Proposed and Existing Structure Locations and Lynx Location Data*
CDOT Proposed 2018 Structures
20'WX10'H concrete culvert or steel arch
Large multi-plate steel arch
Small to medium mammal underpass
Existing Bridges
USFS Lynx Data 2010 & 2011 within 1 mile of Hwy
Climax Male 2011
Stafford Male 2011
Stafford Female 2010
Stafford Female 2011
2011 Successful Lynx Crossing
I70 Lynx Morts 1999 & 2004
0
0.5
1
Miles
N
Created by: M.Cowardin on November 26, 2018
*USFS Rocky Mountain Research Station; CO Lynx Recreation Project
185
186
187
188
189
190
Proposed ARC Location MM 187.4
Lynx Mort May 17, 2004
Lynx Mort July 19, 1999
2011 Successful Female Lynx Crossing at Midnight 5/31/11 USFS Rocky Mountain Research Station Lynx Recreation Project
Vail Pass
Black Gore Creek
Timber Creek Rd
Lime Crk
Shrine Pass Rd
McCollum St
Corral Creek
EAGLE SUMMIT
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community