



COLORADO

Department of Transportation

Restoring Habitat Connectivity

S I-25 Gap Project- Using Beaver Dam Analogs to Restore Preble's Meadow Jumping Mouse Habitat



Presentation Outline

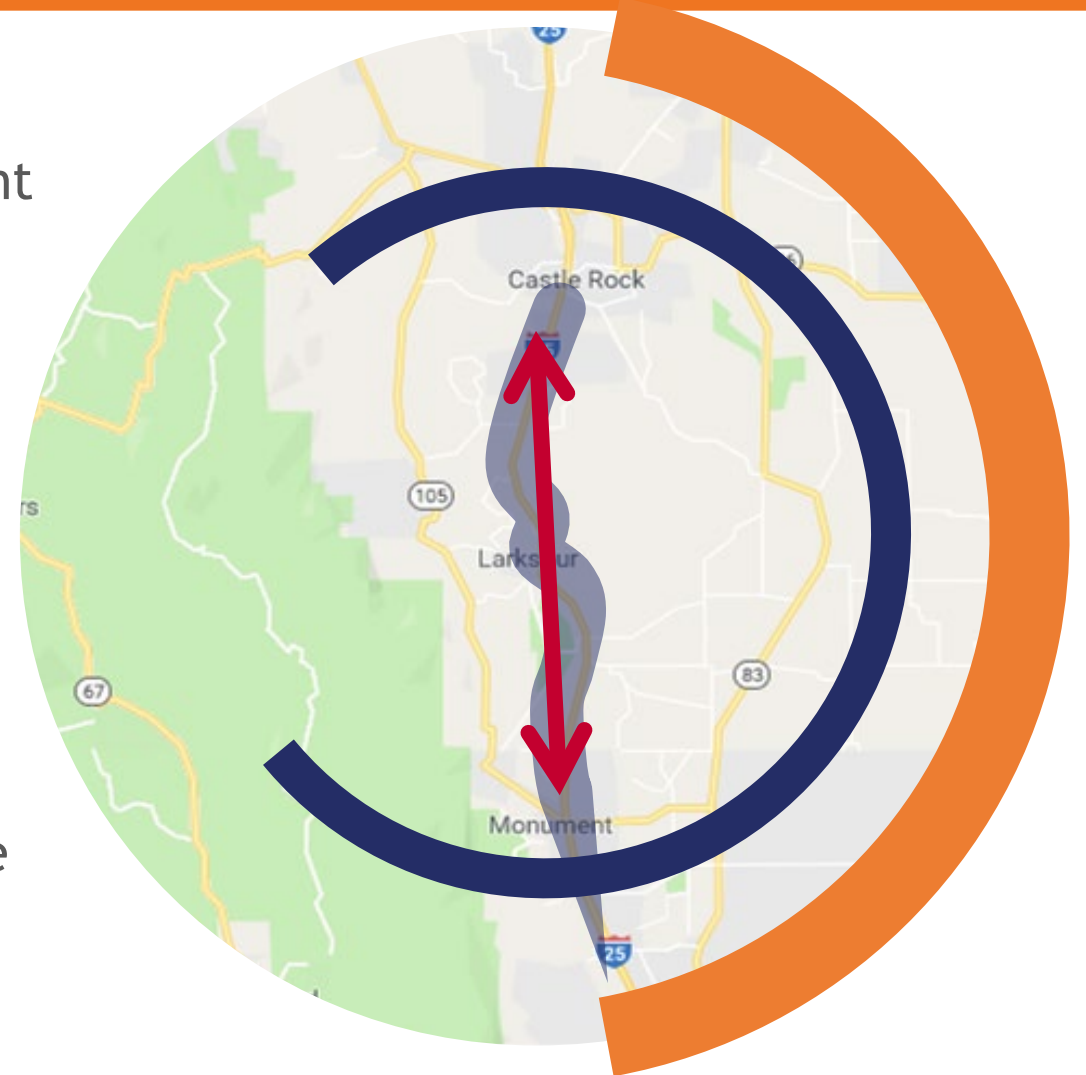
- PROJECT BACKGROUND & PURPOSE
 - Human Connectivity
 - Wildlife Connectivity
- DESIGN & IMPLEMENTATION
 - Wildlife Structures - habitat connectivity
 - Beaver Dam Analogs - hydrologic connectivity
- EARLY RESULTS

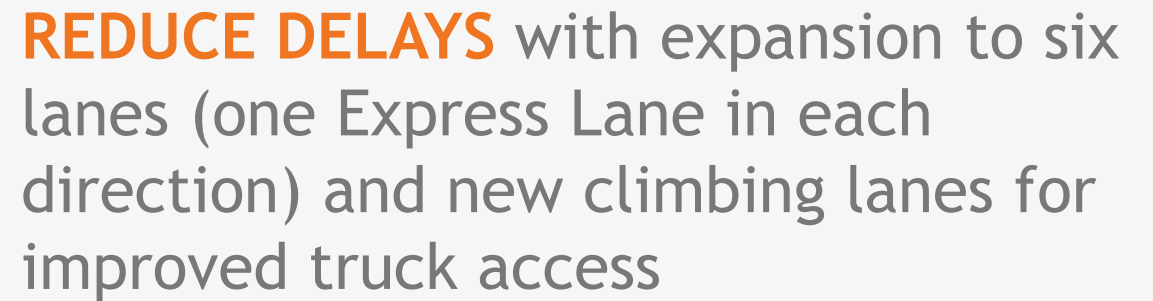


S I-25 Gap Project Background

HUMAN CONNECTIVITY (NORTH to SOUTH)

- 18-miles of I-25 between Castle Rock and Monument
- Only direct connection between Denver and Colo. Springs (**North to South Connection**)
- Higher-than-average weather-related and wildlife/motor vehicle collisions
- Narrow shoulders reduce safety of emergency response
- 1,000 feet in elevation grade
- Growing congestion; not built to handle an average of 87,000-120,000 vehicles per day



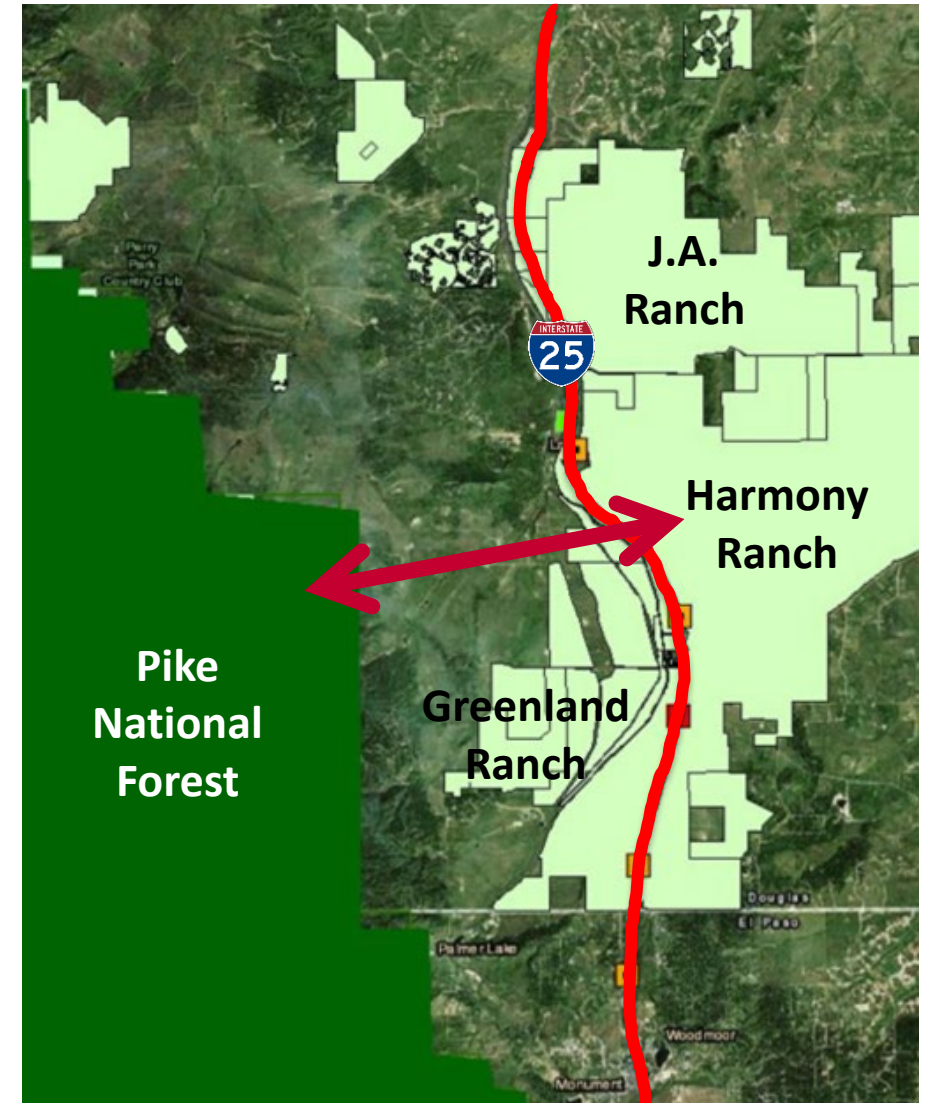




Wildlife Habitat in the Gap

WILDLIFE CONNECTIVITY (EAST to WEST)

- I-25 bisects 55 square miles of conservation easements in Douglas County
- Largest contiguous preserved habitat along the Front Range
- An important wildlife connection between foothills and plains
- Large local elk and deer herds forced to cross I-25 at-grade
- More than one deer/elk hit on I-25 every day in peak season (June and November)
- Occupied habitat for Preble's meadow jumping mouse located adjacent to corridor and at several structures where wildlife improvements were planned.





MP 170.6, Just south of former CDOT rest stop
December 2020

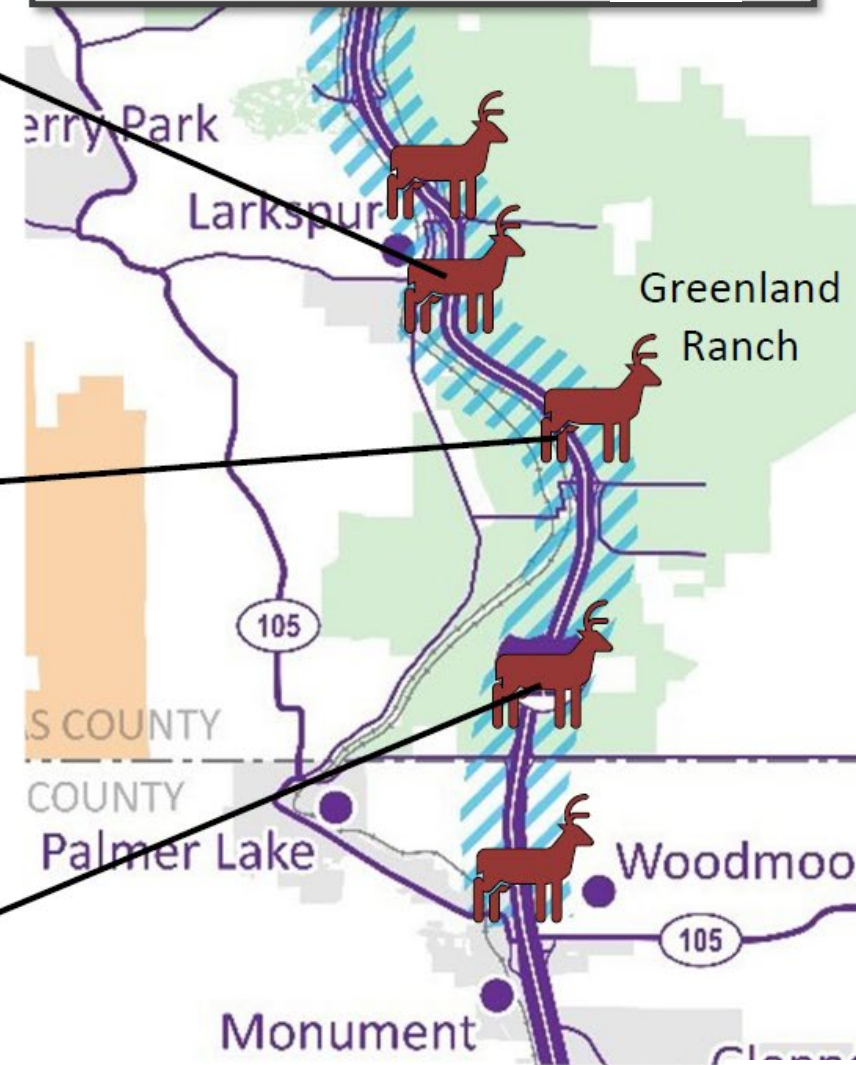


MP 167.7, just north of Greenland Rd
September 2020



MP 164.4, just north of County Line Rd
May 2020

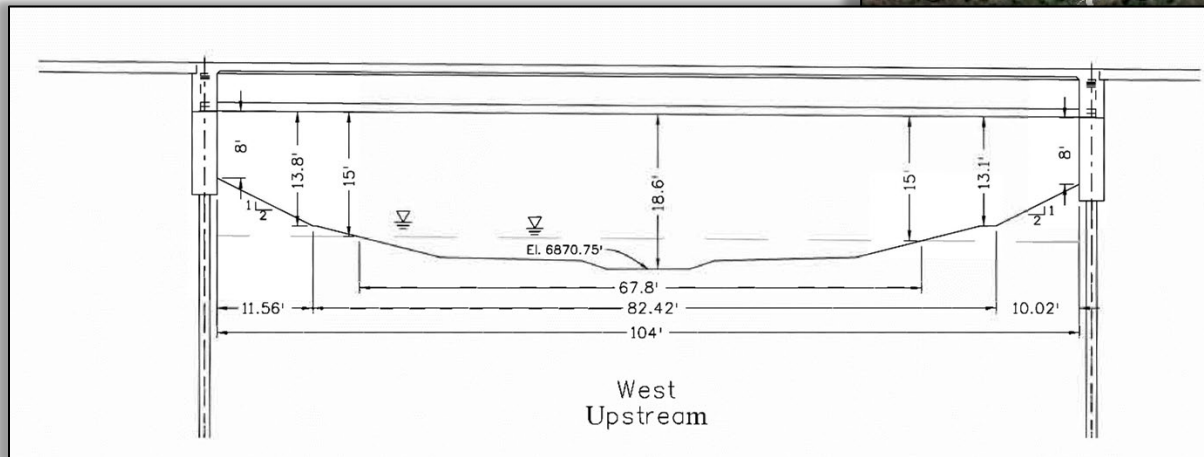
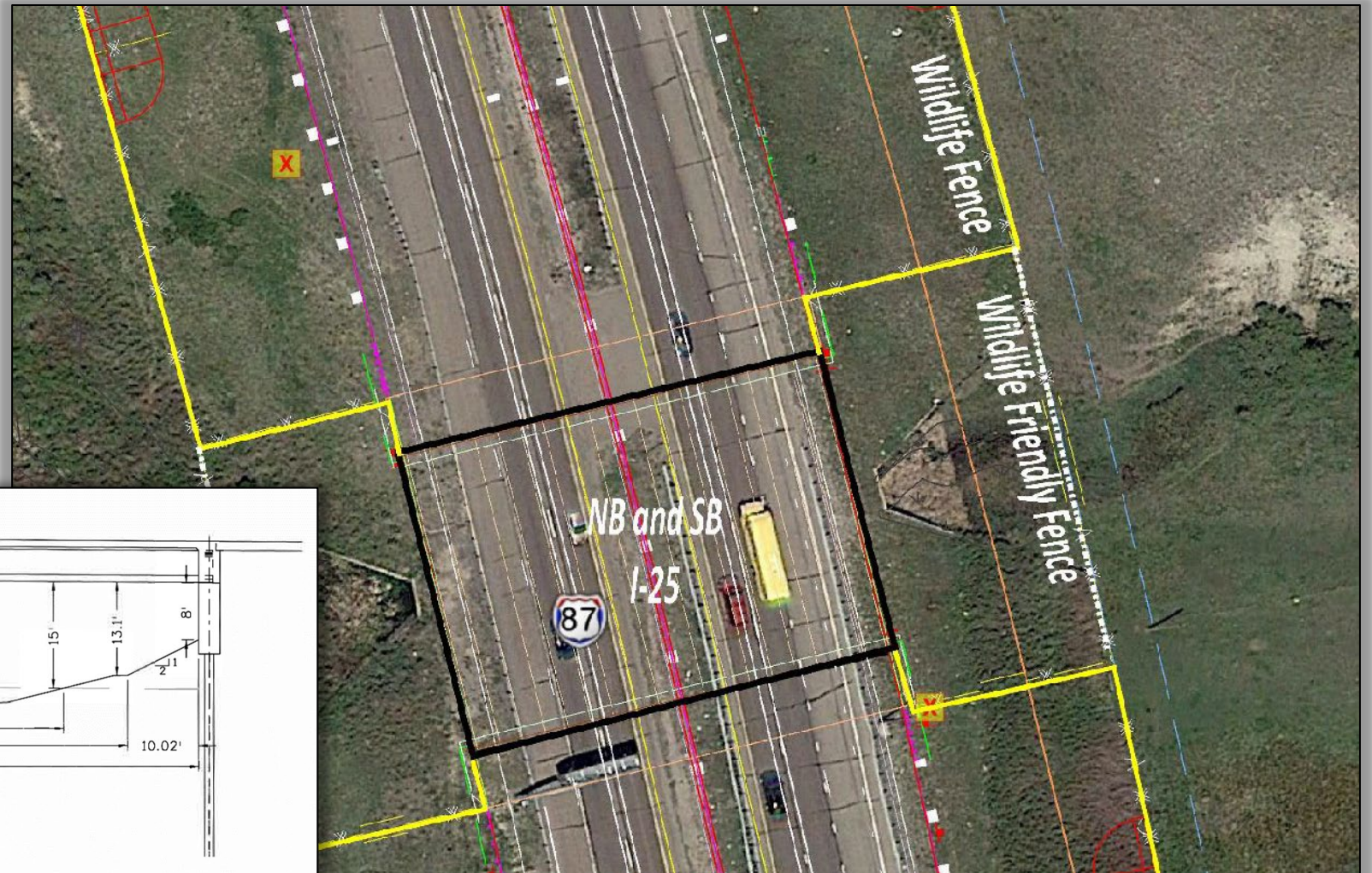
All five of the wildlife underpasses are substantively complete. Final planting will occur through the fall of 2022





Planning Habitat Connectivity Restoration

The wildlife underpass openings measure approximately 18' high by 100' wide, helping to restore wildlife migration between the two largest preserved open space properties that are bisected by I-25







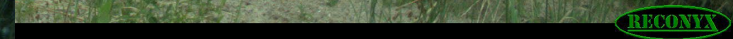
Upgraded to this Wildlife Underpass!

POST- CONSTRUCTION - May 2020





New Underpasses in Action!





Small Fauna Habitat Connectivity Features!



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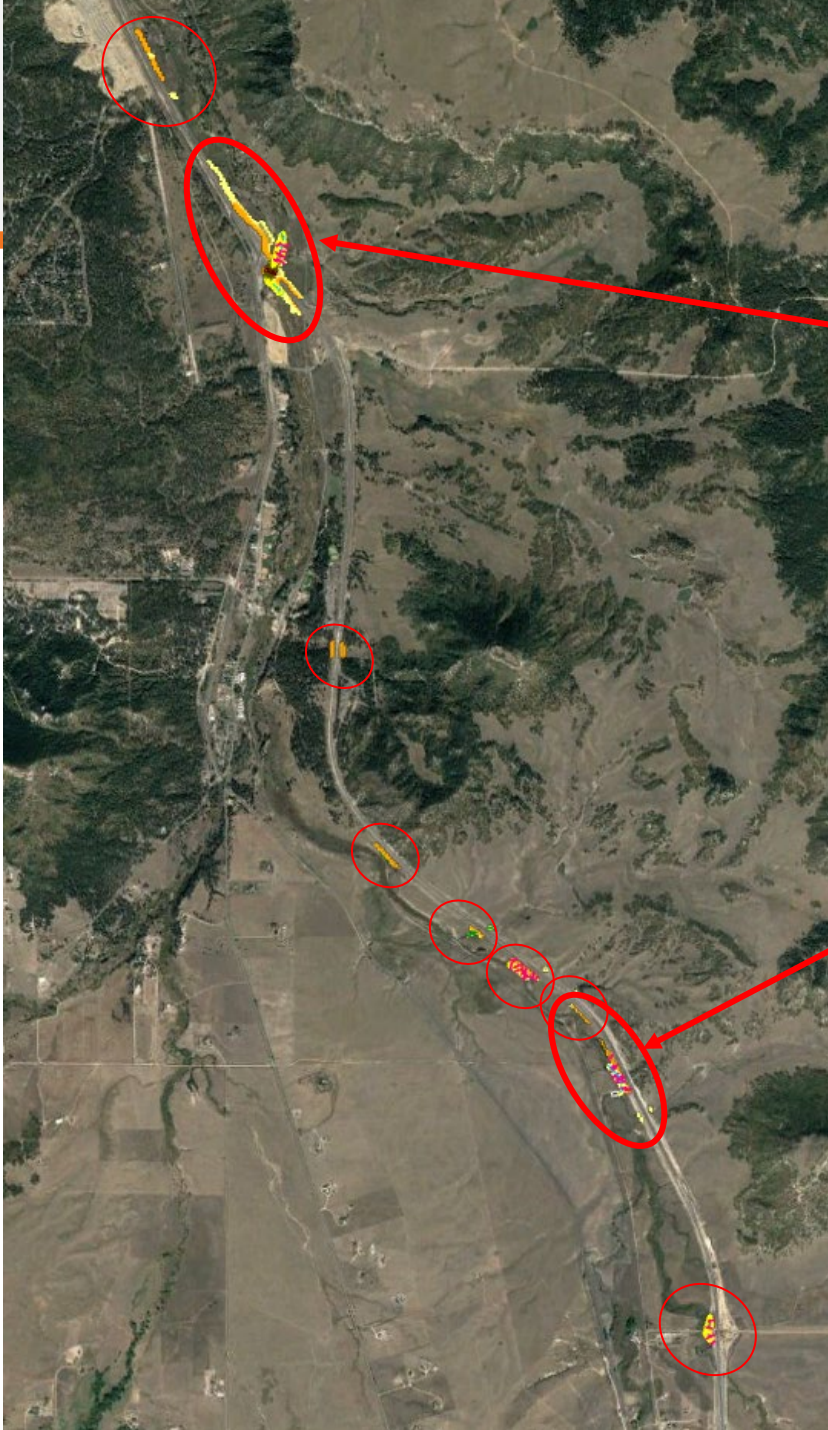
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164-UPSM-S

RECONYX

PMJM HABITAT RESTORATION



Area #3 - BDAs on East Plum Creek

Area #1 - BDAs on Carpenter Creek

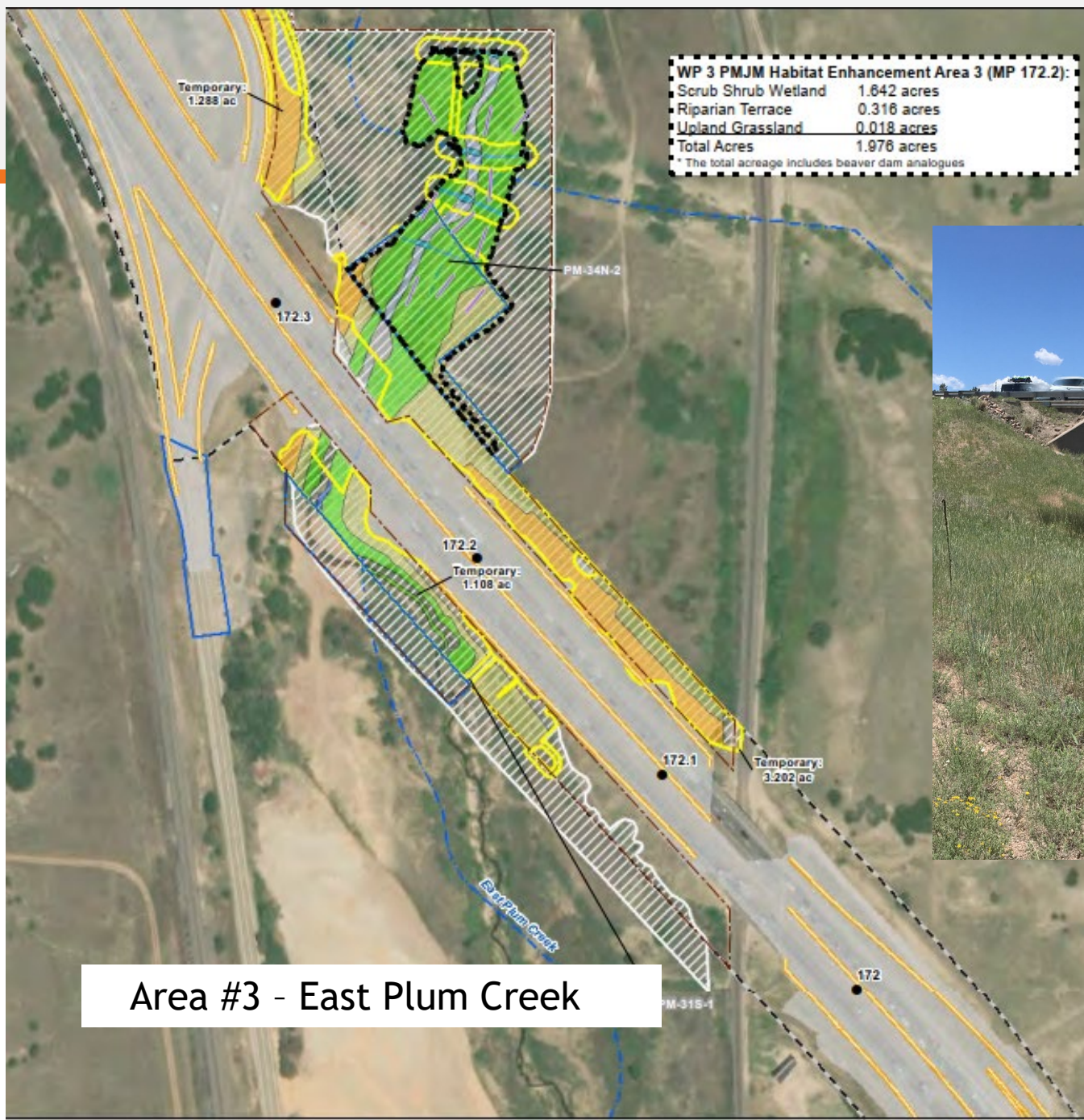
Area #1 - Carpenter Creek



PMJM HABITAT RESTORATION



PMJM HABITAT RESTORATION



PMJM HABITAT RESTORATION





PMJM HABITAT RESTORATION



March 2021 - BDA's completed and functioning on Carpenter Creek

PMJM HABITAT RESTORATION

- May 2021 - East Plum Creek high water BDA “failure”



- July 2021 - beavers to the rescue





PMJM HABITAT RESTORATION

Measured Parameter	Monitoring Method ^a	Success Criteria
Foliar Cover, Canopy Cover & Community Structure & Composition^b	<ul style="list-style-type: none"> Random vegetation transects shall be established and marked with semi-permanent T-posts at rate of roughly one transect per 0.25 acre of assessment area. Transects will be oriented generally parallel to the stream but may be shifted to fit entirely within the target community being assessed. Transects will be 50-feet long with a 1-foot point intercept interval (50 intercepts per transect). Foliar cover shall be recorded for herbaceous stratum (layer). Hits will be recorded at each intercept (species, bare ground, or litter and canopy height), recording one hit per species (include basal leaf hits) at each intercept. This may result in multiple hits per intercept but only one hit per species per intercept, which may result in greater than 100% foliar cover. This data shall also be presented as a relative % for the purpose of BO compliance. Canopy cover shall be recorded for shrub (woody) stratum. Canopy cover considers the shrub to extend to the drip line of the shrub (excludes small opening in the canopy). Multiple species of shrub canopy may be recorded for each intercept, which may result in greater than 100% canopy cover. This data shall also be presented as a relative % for the purpose of BO compliance. Height of vegetation shall be recorded (to the nearest inch) 	<ul style="list-style-type: none"> Herbaceous vegetation along transects in riparian areas must equal or exceed 80% of the foliar cover on undisturbed riparian areas immediately surrounding the project site (expressed as relative cover), and vegetation shall not show signs of stress or continued need for vegetative management (irrigation or herbivory protection, weed management, etc.). Herbaceous vegetation along transects in upland areas must equal or exceed 70 percent of the foliar cover on undisturbed upland areas immediately surrounding the project site (expressed as relative cover), and vegetation shall not show signs of significant stress or continued need for vegetative management. Shrub vegetation along transects in riparian areas must equal or exceed 80% of the canopy cover on undisturbed neighboring riparian areas, and vegetation layer does not show signs of significant stress or continued need for vegetative management. Average canopy height shall increase by a minimum of 20% from baseline condition. (Canopy height shall consider the transect average for woody and herbaceous cover measured separately). Vegetation across all strata shall be dominated by native
Hydrology^d	Groundwater monitoring wells will be installed to record groundwater levels throughout the growing season.	<ul style="list-style-type: none"> In restored PMJM Areas (BDA locations) the depth of groundwater below the surface elevation will be within 30 inches of the soil surface for a minimum of 18 consecutive days, which equals 12.5% of the growing season (May 9 through Oct. 2, 147 days) for a minimum of two years in normal water years^e. Restored PMJM Areas (excluding stream channel) will also not have standing water for greater than 18 consecutive days during the same growing season.

Baseline Conditions Assessment

Vegetation Transects



T3-H

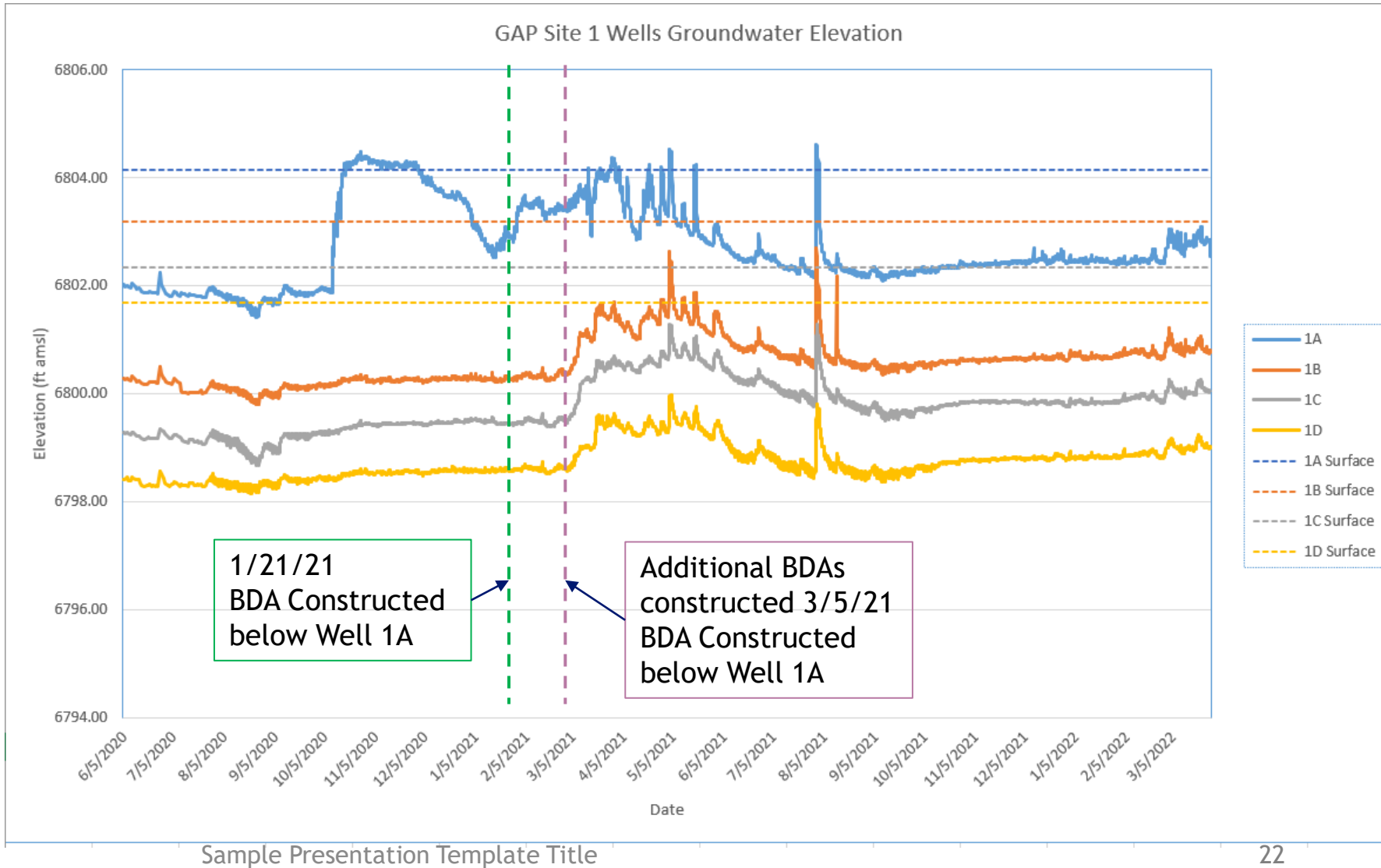


T1-F

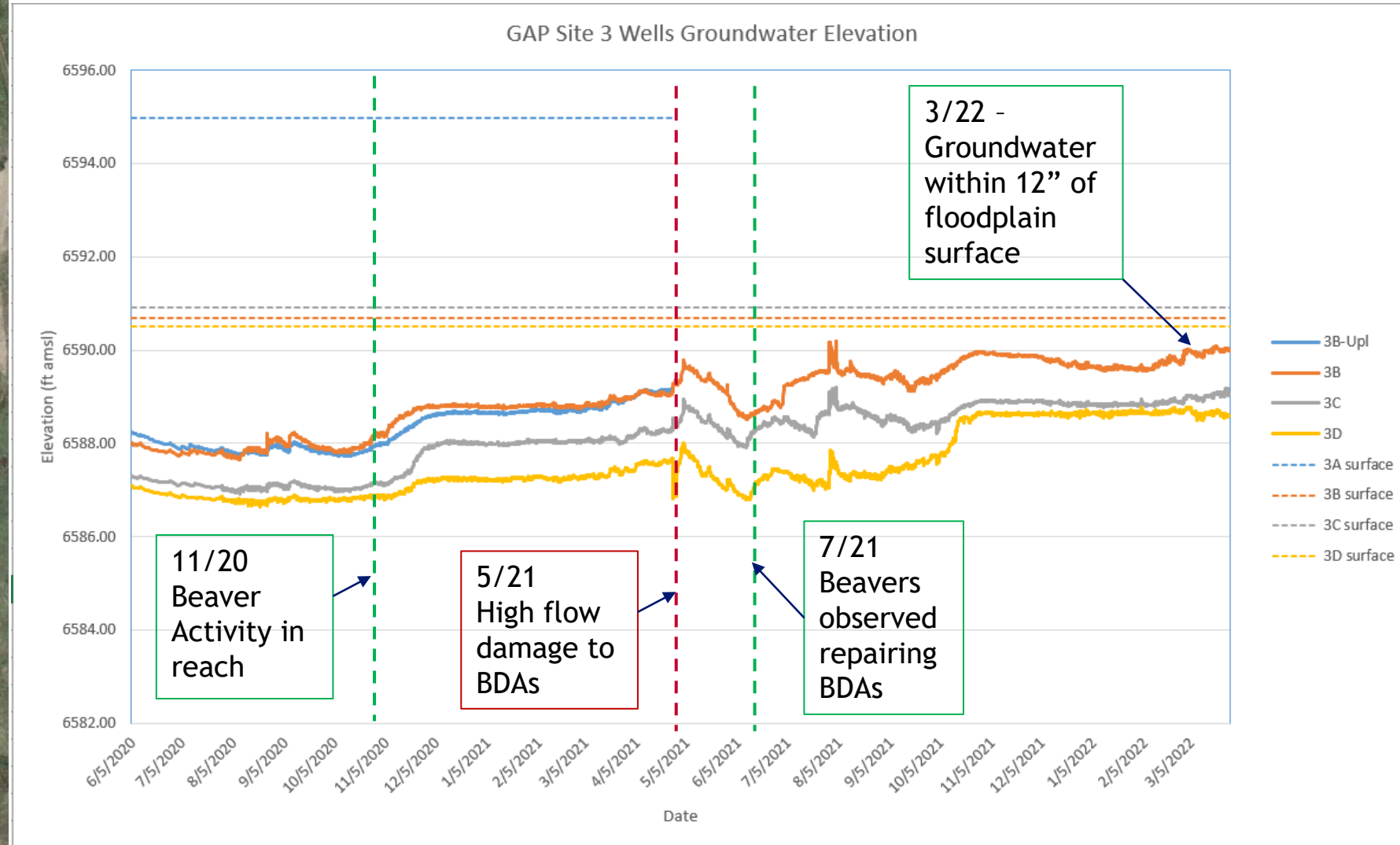
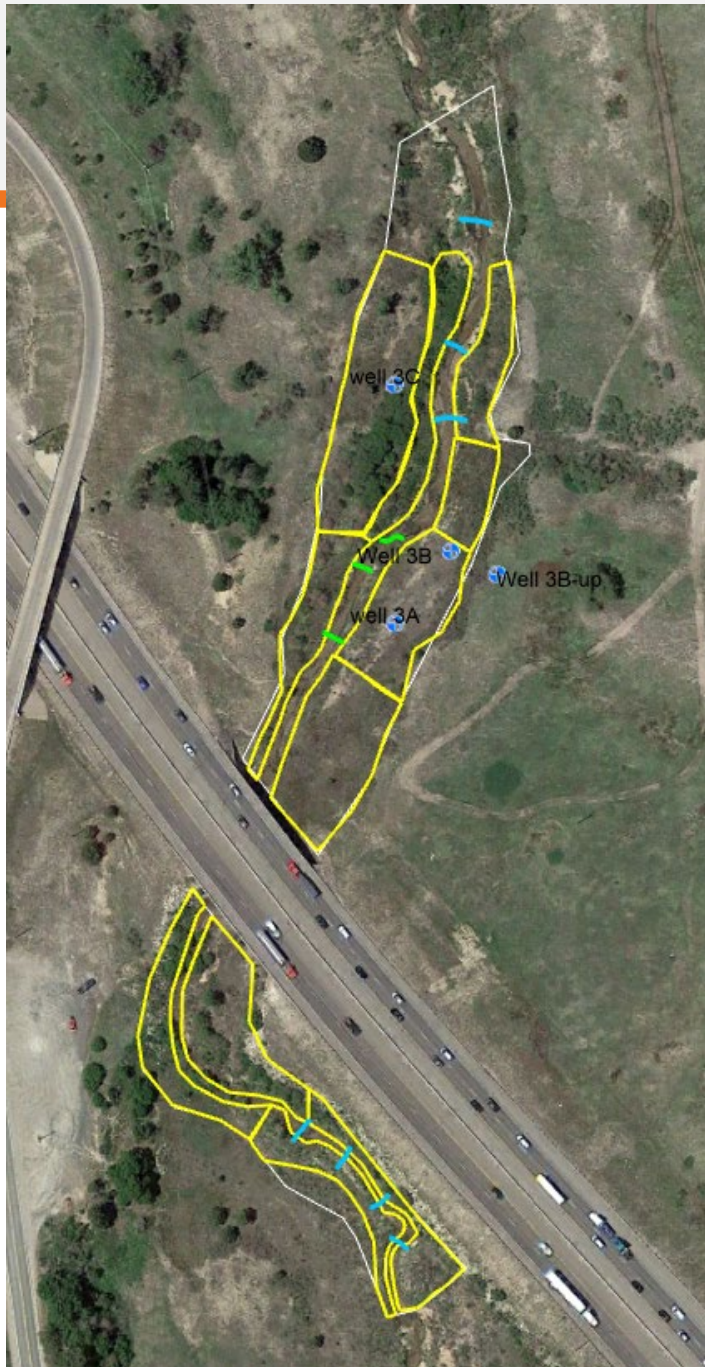
Groundwater Monitoring



Site 1 (Carpenter Creek)



Site 3 (East Plum Creek)





PMJM Baseline Trapping Study

Live Traps (520 trap-nights in August of 2021) CNHP (Schorr):

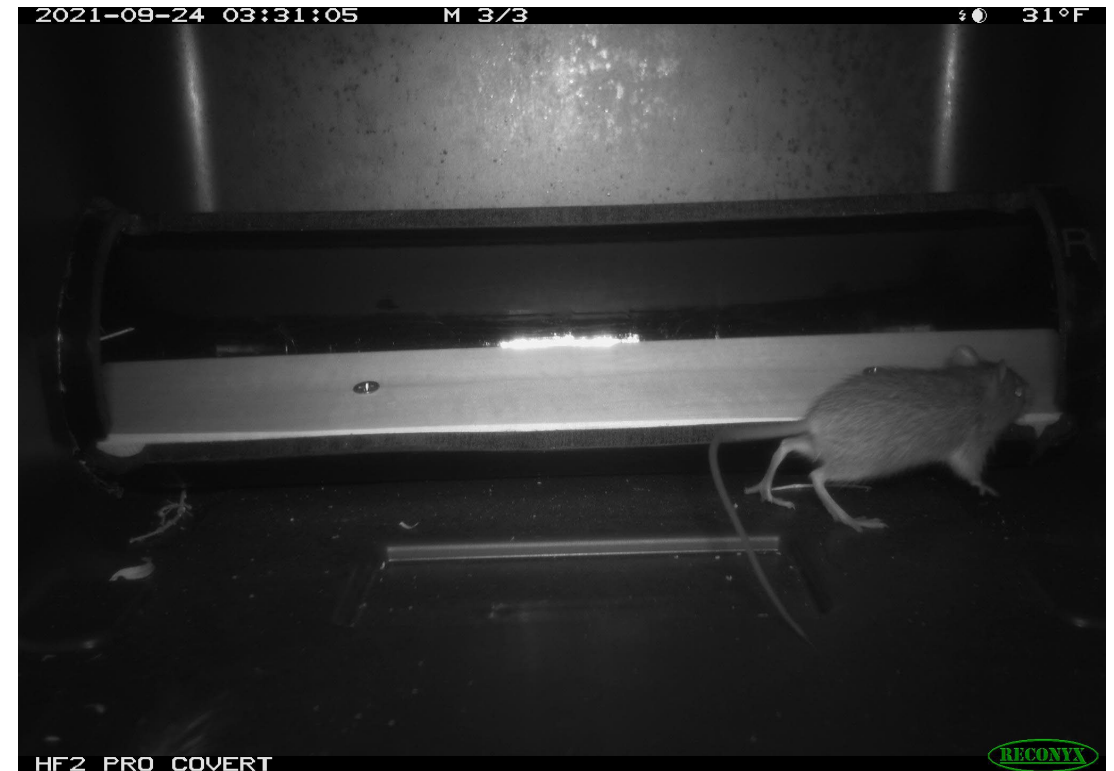
- Carpenter Creek PMJM captures: 10 (2 recaptures)
- East Plum Creek PMJM photos: 5 (3 recaptures)



PMJM Baseline Trapping Study

Camera Boxes (July - October 2021) CORVUS Environmental (Demasters):

- Carpenter Creek PMJM photos: 4
- East Plum Creek PMJM photos: 1





Partnerships Lead to Success!



Colorado Natural
Heritage Program



Colorado
Wildlife &
Transportation
Alliance



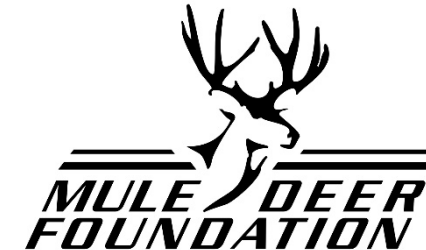
U.S. Department
of Transportation

Federal Highway
Administration



ECO-resolutions, LLC

CORVUS Environmental
Consulting

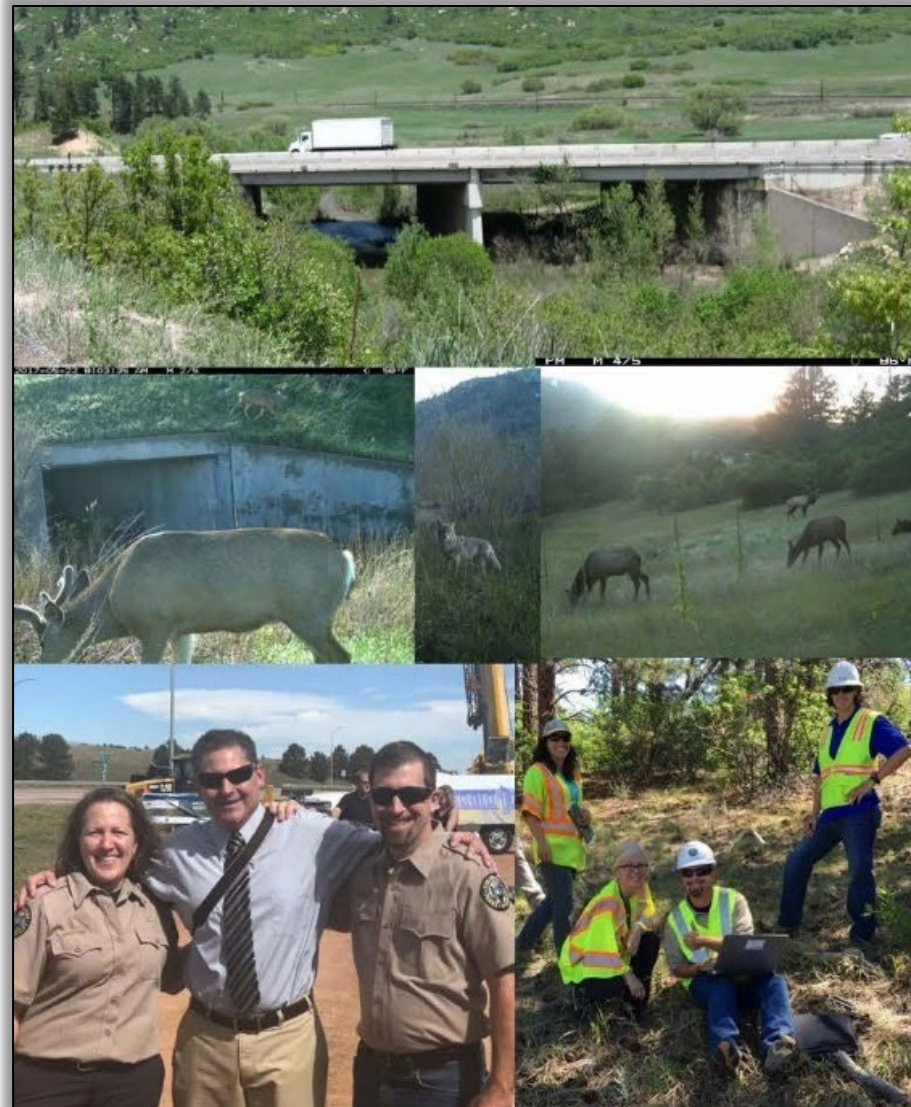


Jacobs





Questions?







August 31, 2018 Groundbreaking





Wildlife Underpass Construction

Span bridge structures were selected as the best structure type. Four new wildlife underpasses and one reconstructed large bridge have been constructed in the project area.





Over the past 5 years, Colorado Department of Transportation (CDOT) and Colorado Parks and Wildlife (CPW) have developed statewide priority planning for wildlife mitigation, and funding has been put in place to address migration and habitat connectivity at both state and national levels. Specific examples include the following:

- Department of the Interior Secretarial Order 3362 (Improving Habitat Quality in Western Big Game Winter Range and Migration Corridors)
- Colorado Governor's Executive Order D 2019 011 (Conserving Colorado's Big Game Winter Range and Migration Corridors)
- Colorado's Western Slope and Eastern Slope and Plains Wildlife Prioritization Studies (Kintsch et al., 2019; Kintsch et al., 2022)
- Recent passage of the 2021 Bipartisan Infrastructure Investment and Jobs Act and its provisions for wildlife mitigation funding

