

Twin Tunnels Environmental Assessment



Purpose:	Twin Tunnels EA and Frontage Road Project ALIVE Meeting		
Day:	Friday	Date:	January 20, 2012
Location:	CDOT Region 1 - Golden		

Participants:

Attendee	Representing
Jim Bemelen	CDOT R 1
Allan Brown	Atkins
Lynne Deibel	USFS
Jim Eussen	CDOT R 1
Janet Gerak	CDOT R 1
Wes Goff	Atkins
Tamara Keefe	Michael Baker
Gina McAfee	Jacobs

Attendee	Representing
Alison Michael	USFWS
Pat Noyes	Pat Noyes & Assoc.
Bob Quinlan	Jacobs
David Singer	CDOT
Jo Ann Sorensen	Clear Creek County
Francesca Tordonato	Jacobs
Paul Winkle	CPW

Discussion Items

The purpose of the meeting was to review the initial list of issues and the work plan and to solicit comments on any of these topics.

Review Issues and Approach to Issues

The commitments and recommendations made by this group will be checked for compliance in each life cycle phase of both the Twin Tunnel and Frontage Road projects. They will also be documented in the Twin Tunnels FONSI and the Frontage Road Decision Document.

The group discussed each topic on the ALIVE Issues Work Plan. Listed below are comments and decisions made.

After receiving updated survey information, the Frontage Road will have a minimum five-foot buffer area between the road and the trail. This buffer area will be permeable for some water collection. The material hasn't been decided upon but the group recommended making it small rocks to make it more attractive to animals.

Because there isn't one map that has the walls from both projects on it, Clear Creek County is concerned what the overall visual impact will be. They are afraid there will be a concrete canyon along Clear Creek. Because the Twin Tunnels is not in the design phase they don't know the exact heights and lengths of the walls. The Frontage Road wall type has been decided but the exact aesthetic treatment hasn't been determined yet. Some of the walls will be rock cut and some may be terraced. The Frontage Road will be completed before the Twin Tunnels is completely designed. CDOT will continue to work with Clear Creek County as the two projects are designed to address the concerns with wall locations, heights and treatments.

Allan Brown will add the lengths and heights of the Twin Tunnels walls to the Frontage Road map and will use the worst case scenario for the Twin Tunnel wall heights and locations. He will also look at opportunities to provide photo renderings of the proposed walls.

CDOT and the design team have had several meetings in the field with Colorado Parks and Wildlife. **Ben Kraft, the new terrestrial biologist for the region will be added to the ALIVE contact list to receive the meeting minutes and be included in any future meetings.**

As a result of the field meetings, recommendations for the pathway for deer and elk under Hidden Valley Bridge over Clear Creek include:

- Softening the approach upstream
- Replacing riprap and boulders under the creek with smaller types
- The pathway on the south side of the bridge will be closed during construction with a barrier to keep wildlife away.

The existing fence on the north side of I-70 at the west portal of the westbound tunnel is made of barbed wire and different types of woven mesh. Animals are getting caught in the barbed wire. CPW recommended the fence be completely removed. The fence is on CDOT right-of-way; however, since this is an open grazing area, the property owner doesn't want the fence completely removed. There have not been any cattle seen down by the road in quite some time but they are up on the hill.

Recommendations include:

- Keep the fence at its current location and replace the existing fence with one that is smooth on the top and bottom with a 16" separation on the bottom and 12" on the top. The fence will be tied into the wing wall of the box culvert.
- Remove the junipers and pines in the grassy area to improve visibility for both motorists and big horn sheep.

The temporary fencing on the north side of old US 40 from the west portal to the doghouse rail bridge is needed to keep wildlife away from the detour. Recommendations include:

- Colorado Division of Wildlife will put salt blocks up on the hill to keep the deer away from the salt and deicing fluids on the detour.
- The vegetation on the north edge of I-70 west of the tunnel that reduces visibility of wildlife along the side of the road should be removed for the safety of the sheep and vehicles on I-70.

- The vegetation on the north side of road by the game check area should be removed to improve stopping sight distance for motorists and visibility for big horn sheep.
- **Clear Creek County will need to be consulted about proposed vegetation removal in the game check station area to address visibility and safety concerns for the detour.** CDOT could give Clear Creek a credit for the trees removed. Clear Creek could select the type of trees and plant them where they want.

Recommendations for improvements to the culvert on the south side west of the Twin Tunnels include:

- Tie the fence to the existing wing walls to leave the drainage open.
- Retrofit the base of the culvert with more natural bottom. The suggestion was made to use 4"-4" baffles and fill with base course to the top of the baffles. There may need to be a check dam for flood events.
- Improve the drop-off in the outflow area to accommodate wildlife.
- The cameras were installed but were too high. They have been relocated and CDOT expects to have a more accurate inventory of what is using the culvert.

The group would like a plan view to indicate where the work is being proposed and wildlife movement is.

The group received the Draft Aquatic Habitat Conceptual Design as a handout. The enhancements are a separate action for permitting from either the Twin Tunnels or Frontage Road projects. The enhancements to Clear Creek will be done during construction to reduce the costs provided they can be done outside of brown trout spawning season (October-June). A baseline fish sampling will be done before and after the enhancements.

Decreasing the channel width will increase the depth of the creek which will improve conditions for the rafting community. **The Frontage Road Team has started contacting rafting companies who use Clear Creek. It was agreed they should be asked if they agree that adding boulders to the creek will improve the rafting.**

Construction waste is usually given to the contractor to dispose of. **It was suggested this would be an excellent opportunity to give CPW some of the larger size rocks for stream enhancements. Jim Bemelen agreed this could be written into the construction specifications.**

There will be no permanent lighting on the Frontage Road. There is a need for temporary lighting on old US 40 to the dog house rail bridge during the detour because of the sharp curves and possibly at the trail crossing west of Hidden Valley. CDOT and the County will consider the need for push-button activated, flashing beacons or other lighting at that crossing. The group is concerned about potential conflicts between the lighting and wildlife. **The ALIVE group will meet during Twin Tunnels final design to discuss lighting issues.**

Coordination between both projects is ongoing. The SWEEP, ALIVE, Section 106, the Greenway Issues Task Force, and PLTs have representatives from both projects.

As reports and tech memos are finalized they will be uploaded to the CSS website. It would be better to include links instead of PDFs to minimize the amount of document management needed.

CDOT will use their standard Environmental Commitment Tracking Spreadsheet to document the commitments made and any changes to CDOT's normal standards for both the Twin Tunnels and Frontage Road projects.



Twin Tunnels EA and Frontage Road Project

AGENDA

Purpose:	ALIVE Meeting		
Day:	Friday	Date:	January 20, 2012 10:00 am
Location:	CDOT Region 1 - Golden		

Introductions

Review Issues

- Initial list of issues

Review Approach to Issues

- Work plan

Review and Finalize Recommendations



Twin Tunnels EA and Frontage Road Project ALIVE Issues Work Plan

Wildlife Connectivity and Habitat			
<i>Issue</i>	<i>How it will be addressed/ Recommendation</i>	<i>Information and data needs</i>	<i>CDOT Lead</i>
Barrier separation along Clear Creek Greenway	Identify location for breaks and consider various designs and types	Drainage locations	David Singer
Need to provide pathway for deer and elk under Hidden Valley bridge over Clear Creek	Will include deer passage under bridge and improve bench in project design		
Sheep get stuck in the fence along north side of I-70 at the west portal of the westbound tunnel	Minimal fencing. If needed, must meet CPW guidelines	Identify existing fence ownership	Jim Eussen
Fencing needed on south side of the tunnel during I-70 construction to redirect wildlife downstream away from the detour	Temporary fencing will be installed on the north side of old US 40 from the west portal to the doghouse bridge. Temporary lighting will be used during detour.		

Wildlife Connectivity and Habitat			
<i>Issue</i>	<i>How it will be addressed/ Recommendation</i>	<i>Information and data needs</i>	<i>CDOT Lead</i>
Consider opportunities to accommodate wildlife in culvert west of the Twin Tunnels near Clear Creek Rafting	Maintain access on the south end to allow animals to move up and down Clear Creek. Improve drop from outlet.	Set cameras to inventory use.	Jim Eussen
Aquatic and fish permeability and passage	Develop design with CPW and USACE for permitting.	CPW to conduct fish survey in the fall of 2012 as baseline.	Jim Eussen
Limit lighting on the frontage road and at wildlife crossings	Directional light at Hidden Valley bridge. No permanent lighting on the frontage road.	Confirm frontage road lighting.	David Singer
Coordinate between the two projects to enhance connectivity	Ongoing		David Singer
Information Needs and Updates			
<i>Issue</i>	<i>How it will be addressed</i>	<i>Information and data needs</i>	<i>CDOT Lead</i>
Need project specific and small species data not included in the recent I-70 inventory	Add to CSS inventory on website	<ul style="list-style-type: none"> - CPW aquatic survey - Camera inventory in culvert - Landowner observation documentation - Migratory bird survey 	Janet Gerak/David Singer

Twin Tunnels Environmental Assessment and Frontage Road Project ALIVE Meeting*

January 20, 2012
CDOT Region 1

** Habitat concepts and improvements recommended in this presentation are conceptual and subject to revision*



Issue: Hidden Valley Bridge over Clear Creek





**View of existing bench under the
Hidden Valley Bridge**



Hidden Valley Bridge over Clear Creek

View of habitat on the upstream side of the bridge- note steep banks and large riprap.



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Idaho Springs/Clear Creek County



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Recommendations at Hidden Valley Bridge

- When the bridge at this location is extended it is recommended to extend and maintain the existing bench.
- The approach on the upstream side of Clear Creek should be improved and “softened” to allow animals to move more freely (the approach on the upstream side of the creek is steep and there is large riprap).
- Replace large boulders and riprap with substrate that is more wildlife friendly.



Issue: Existing Fence on North Side of I-70



Existing Fence on North Side of I-70

Issues with existing fence:

- **Sheep have been tangled in fence.**
- **Fence has several different types of woven wire.**
- **Barbed wire is very loose and is on both the top and bottom strands, which is the most lethal fence to wildlife.**



Woven-wire fence, especially if topped with barbed wire is the most lethal fence to wildlife.



» *Picture from Colorado Division of Wildlife:
Fencing with Wildlife in Mind, 2009 (Page 4).*

Existing fence on north side of I-70:

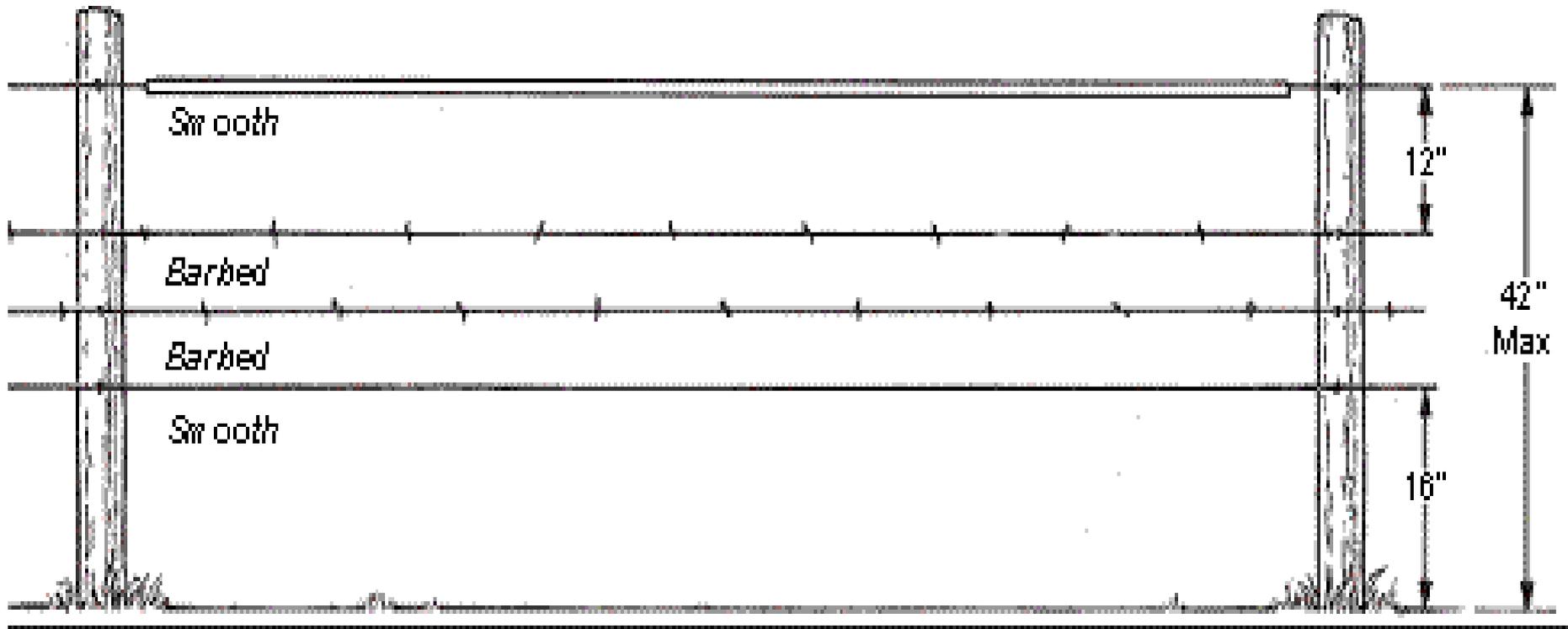


Existing fence on north side of I-70:

- Initial recommendation from CPW was complete removal of the fence.
- CDOT Region 1 contacted the landowner, Richard Young
- Landowner requested the fence remain in place because it is only fence that keeps his livestock of I-70



Colorado Parks and Wildlife Fencing Recommendation:

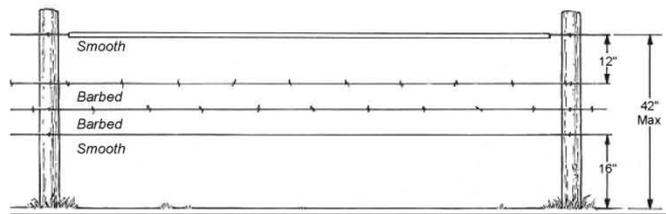


Graphic from Colorado Division of Wildlife: Fencing with Wildlife in Mind, 2009 (Page 7).

Recommended Wildlife Improvements on North Side of I-70

- **Replace existing fence in the same location with more wildlife friendly fence per CPW recommendations.**
- **Fence should be replaced from the west portal to Clear Creek.**
- **Remove pines and junipers on north side of I-70 to improve motorists' ability to detect sheep as they exit the tunnel.**





- Barbwire Fence
- Wingwall*
- Box Culvert
- Vegetation Removal

*Fence will be tied into the wingwalls of the CBC to encourage wildlife usage.



Existing fence: Combination woven-wire fence topped with barbed wire.

Schematic of Wildlife Friendly Fence

Data Source: Colorado DOT (2011-Interstate, and County Bounds)
 Clear Creek County (2011-Streams, City Limits, County Roads, Aerial
 Photography), Atkins (2010)

Date: 1/19/2012

Recommended Wildlife Mitigation Strategies During the Detour

- **Concern: deicing liquids and salt placed on the road during the detour may attract bighorn sheep down to the roadway.**
- **Several fencing strategies were discussed and it was recommended that a 10 foot fence be placed only on the north side of old US 40.**
- **The fence would be placed on the south side of the ditch and would run approximately from the west side of the tunnel to the Dog House Bridge.**



Wildlife Mitigation Strategies During the Detour (Continued)

- **The ten foot fence that will be placed on US 40 is temporary and will be removed after traffic is no longer being diverted onto the detour.**
- **It is recommended that the existing vegetation at the edge of pavement on the north side of US 40 be removed to improve visibility and detection of wildlife for drivers. In addition, temporary lighting should be used on the detour to improve safety and detection of wildlife on the roadway.**



Recommended Wildlife Mitigation Strategies During the Detour- Remove Vegetation



Recommended Wildlife Mitigation Strategies During the Detour- Remove Vegetation



Consider Opportunities to Enhance Wildlife Movement in Concrete Box Culvert near Mile Marker 242

- **The existing barbed wire fence crosses one intermittent drainage just west of the west portal near MM 242. There is a concrete box culvert (CBC) at this location that carries flows from this drainage under I-70 and discharges to Clear Creek.**
- **Enhancement opportunities at this location are being recommended to enhance wildlife movement/connectivity. The CBC currently has a concrete bottom and the discharge point at Clear Creek has a steep drop-off.**



Consider Opportunities to Enhance Wildlife Movement in Concrete Box Culvert near Mile Marker 242



View of intermittent drainage- facing north **(note existing barbed wire fence across drainage)**



Concrete Box Culvert- view from north side of I-70



Concrete Box Culvert-

Concrete Bottom



Steep Drop-Off



Concrete Box Culvert- Opportunities for Enhancement

- If the fence is replaced, it is recommended that the drainage be left open- and instead of fencing across the drainage (like the existing condition) the fence should be tied in to the wing-walls of the CBC to encourage wildlife usage.
- It is recommended that the CBC be retrofitted to provide a more natural substrate on the bottom. Baffles could be installed to retain sediment and prevent scour. A natural substrate on the bottom is recommended to promote usage by wildlife.





CBC Wildlife Monitoring

Motion detection wildlife cameras have been in place since January 4, 2012....



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Aquatic Habitat Improvement Concepts to Consider in Project Area

- There are two dominant stream channel types in the project area
- 1) A straight channel with relatively high gradient, high water velocity and confined by steep banks.
- 2) Lower gradient sections that are over 70 feet wide or greater with uniform depths with little instream cover from velocity and very little winter refuge habitat.



Aquatic Habitat Improvement Concepts to Consider in Project Area

- Objective: Increase juvenile refuge in swift sections and overwinter trout habitat in sections where widths exceed 70 feet





Reference Habitat Section upstream of I-70 Bridge Near Idaho Springs



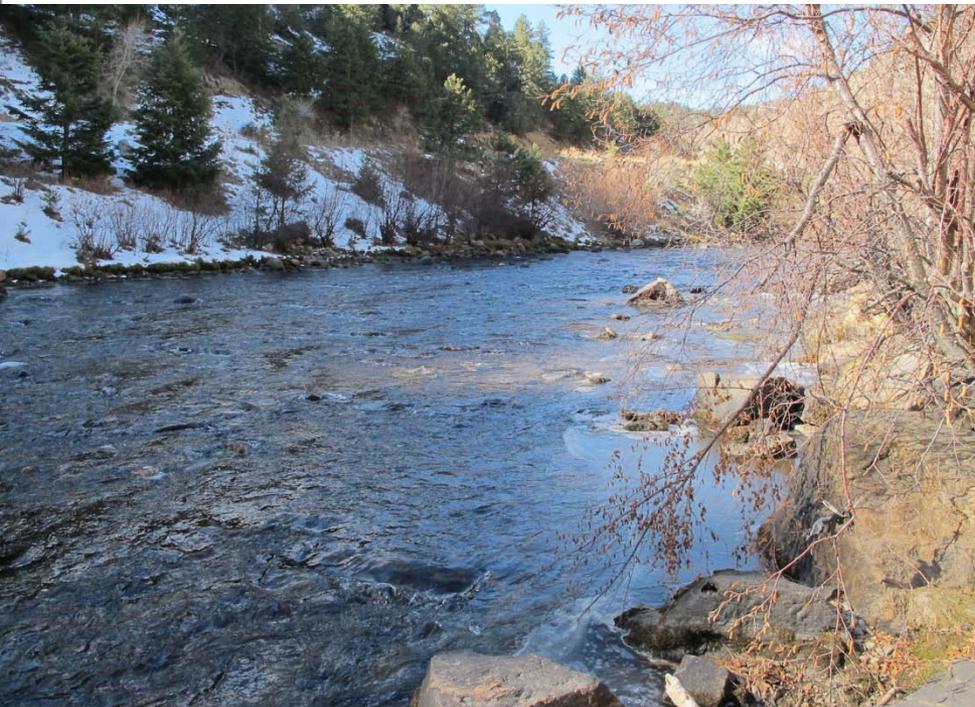
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Aquatic Habitat Improvement Concepts to Consider in Project Area

**Potential habitat improvement site
upstream of Dog House Bridge**



**Potential habitat improvement site
upstream from Central City
Parkway**



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DOT
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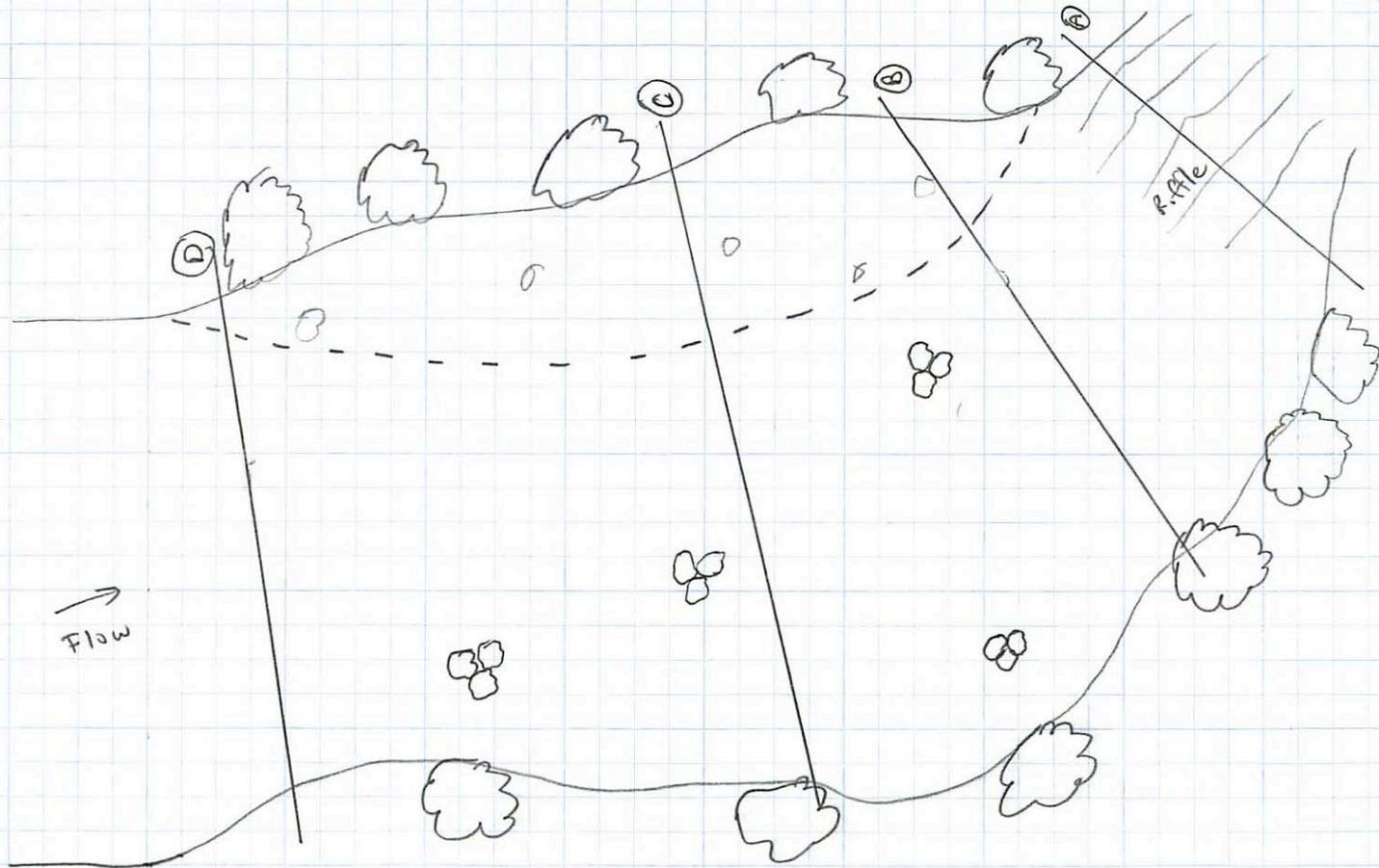
Potential habitat improvement site downstream from Hidden Valley exit



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Sheet 1 - Example habitat improvement plan view.



Example habitat improvement plan view in wider stream section. Dotted line represents edge of constructed point bar at low flow

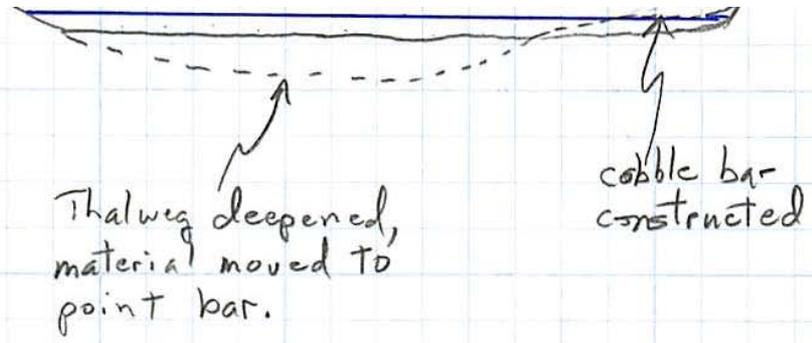
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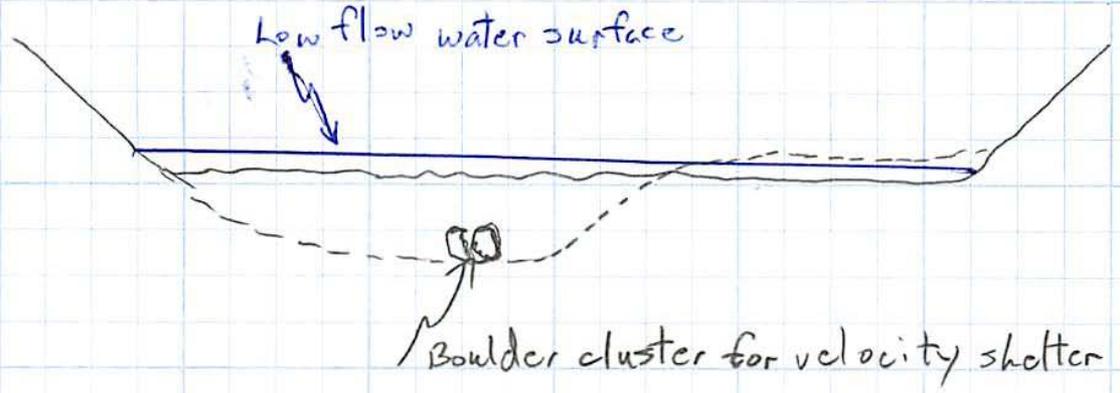
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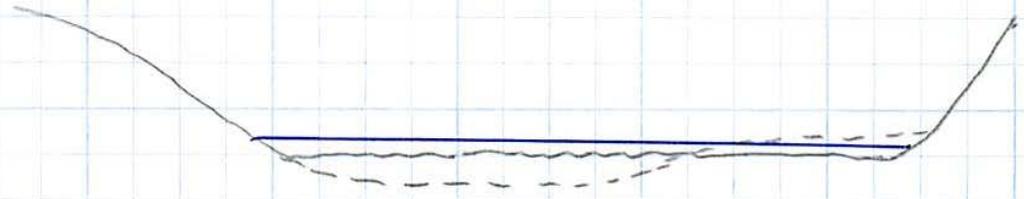
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(D)



(C)



(B)

Example of cross sections in habitat improvement sites. Dotted line represents future bed profile and point bar construction

(Conceptual Design- Subject to Revision)



Habitat Concepts to consider for Clear Creek in Twin Tunnels project area.

This document addresses the potential for habitat enhancements in Clear Creek in the Twin Tunnels Project area. It follows the SWEEP guidelines for CDOT to investigate stream enhancement opportunities in CDOT project areas. It is not intended as mitigation for the Twin Tunnels Project since no impacts to stream habitat are expected from the Twin Tunnels Project.

There are two dominant stream channel types in the project area. 1) a straight channel with relatively high gradient, high water velocity and confined by steep banks. 2) lower gradient sections that are 70 feet wide or greater with uniform depths with little instream cover from velocity and very little winter refuge habitat.

Objective – increase juvenile refuge in swift sections and overwinter trout habitat in sections where widths exceed 70 feet.

A habitat reference for the area is a section of stream upstream of I-70 on the upper end of the study area (Polygon A – Attached Sheet 2). This area is approximately 60 feet wide from grass line to grass line with approximately 40 feet of width at base flow. The stream has a deepened thalweg with boulders which provide velocity shelter. The greater depth, approximately 2-3 feet deep, provides low flow and winter refuge habitat. This stream section has a point bar on one bank that is overtopped at high flow but functions to narrow the stream width at lower flows (Figure 1). This habitat reference could be used as the pattern for stream improvement in the widened lower gradient stream locations. Examples of areas where this concept could be applied are Polygons C and D (Sheet 4, Figure 2), Polygon E and F (Sheet 7, Figure 3, Figure 4) and Polygon G (Sheet 10). There may be other locations as well. The examples are included to illustrate potential improvement areas. A full inventory of the study area is recommended prior to making the selection for habitat improvement sites.

The improvement site would ideally have a downstream riffle that provides a hydraulic control (Figure 5). The objective for this habitat concept is to create a deepened thalweg and use the material to create a shallow point bar on the side of the channel (Figure 6). The improvement should not alter the cross section to a point where the downstream water surface changes at lower flows. The improvements should include gradual bed surface changes in stream contours without hard breaks. The changes to depth would be excavation that creates a maximum low flow depth of approximately 2-3 feet at the deepest location and tapering to existing grade on the upstream and downstream section lines. After the bed is contoured, boulder clusters could be placed to create velocity shelters.



Figure 1. Reference habitat section upstream of I-70 bridge near Idaho Springs (Polygon A). Note the point bar on the opposite bank and deepened thalweg with boulders.



Figure 2. Potential habitat improvement site upstream of Dog House Bridge (Polygon C).

Subject to Revision



Figure 3. Potential habitat improvement site upstream from Central City parkway (Polygon E).

Subject to Revision



Figure 4. Potential habitat improvement site downstream from Hidden Valley exit (Polygon F).

Subject to Revision

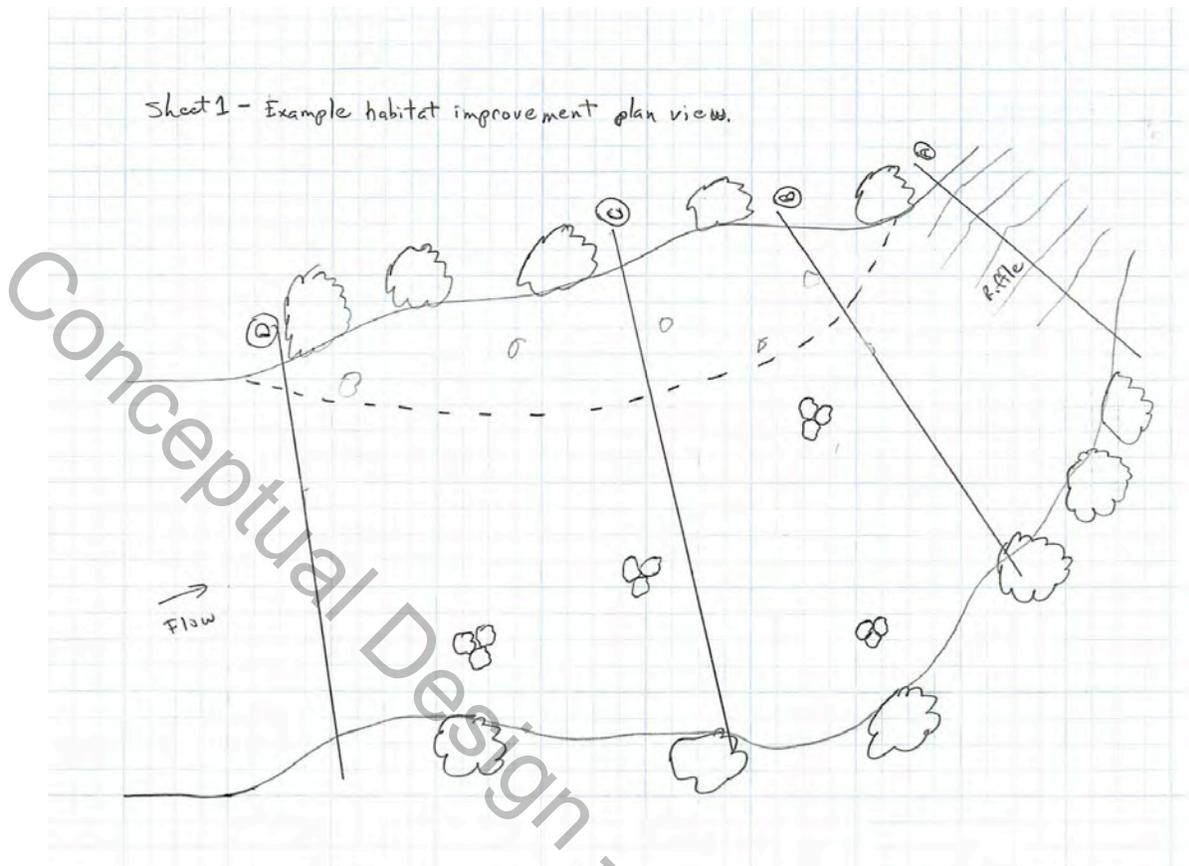


Figure 5. Example habitat improvement plan view in wider stream section. Dotted line represents edge of constructed point bar at low flow.

Sheet 2 - Example habitat improvement - cross section view. Solid line = existing grade, dotted line = future

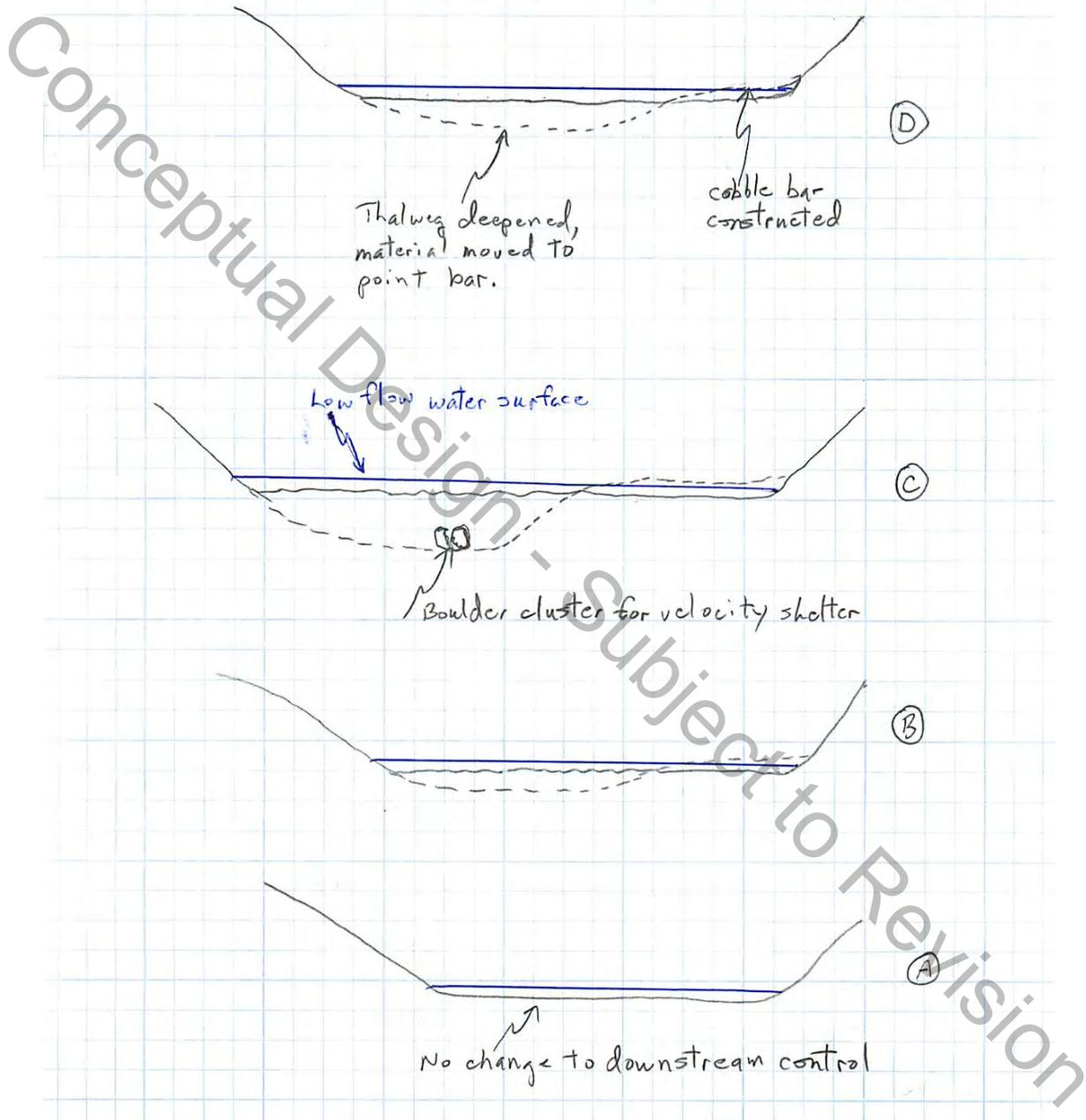
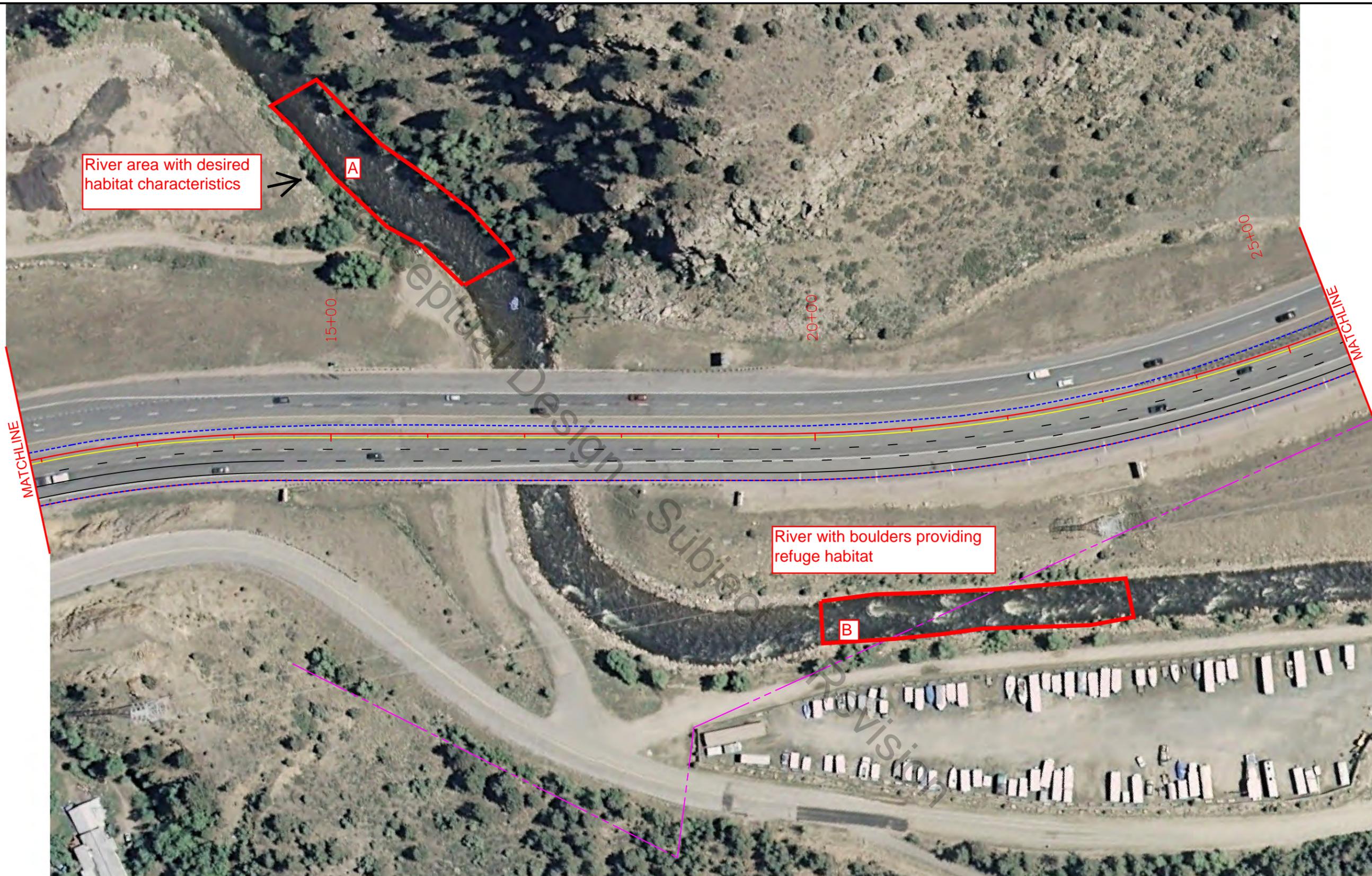


Figure 6. Example of cross sections in habitat improvement sites. Dotted line represents future bed profile and point bar construction.



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Vert. Scale:	
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Unit Leader Initials:	
ATKINS	4601 DTC Boulevard, Suite 700 Denver, CO 80237 Phone: (303) 221-7275 Fax: (303) 221-7276

LEGEND	
- - - - -	Proposed Disturbance Limits
- - - - -	Right-of-Way

PRELIMINARY SUBJECT TO REVISION	
CONCEPT PACKAGE 2	
Subset Sheets: Plan	Sheet Number: 2

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Potential habitat improvement areas

C

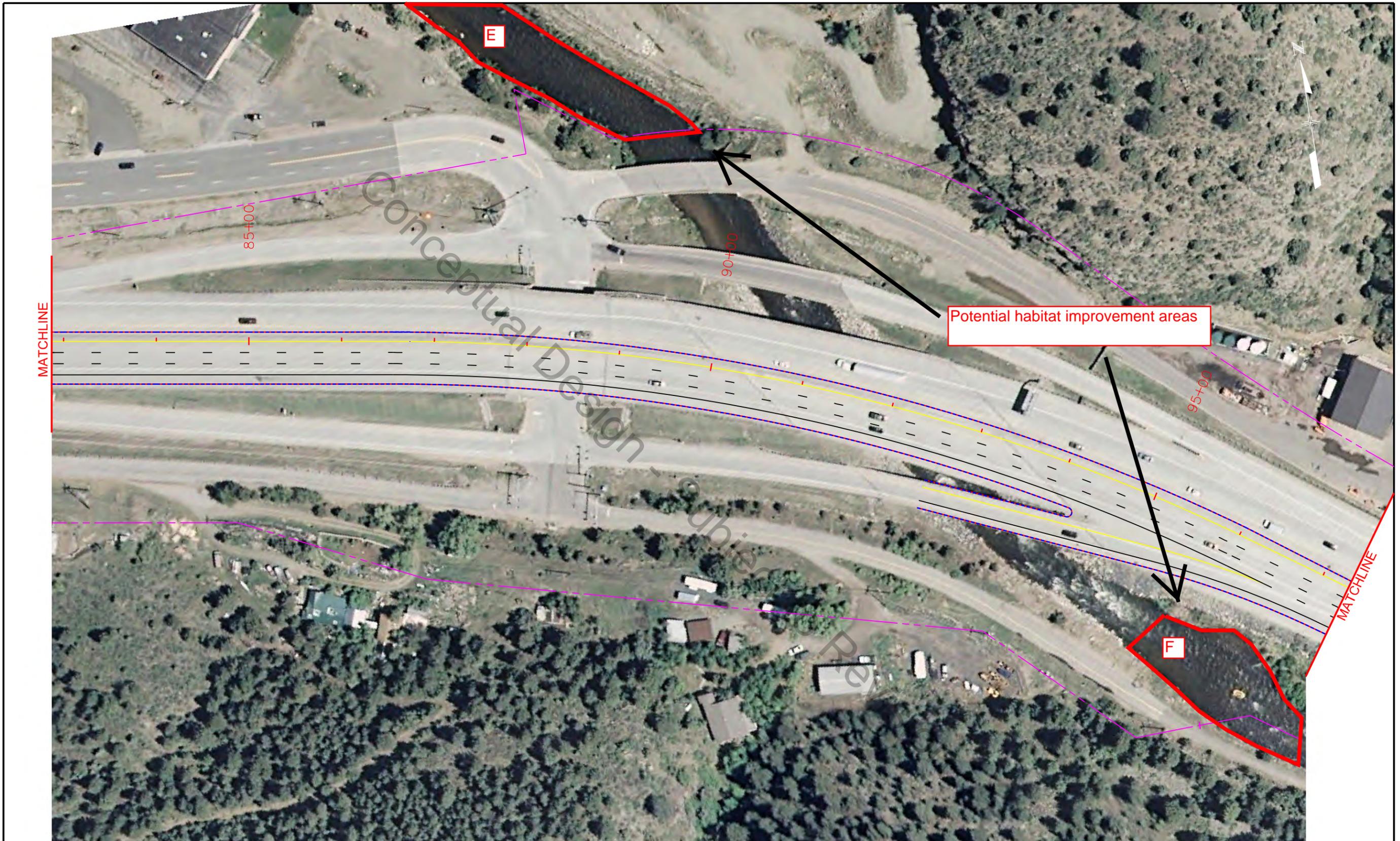
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Unit Leader Initials:	
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-----	Right-of-Way

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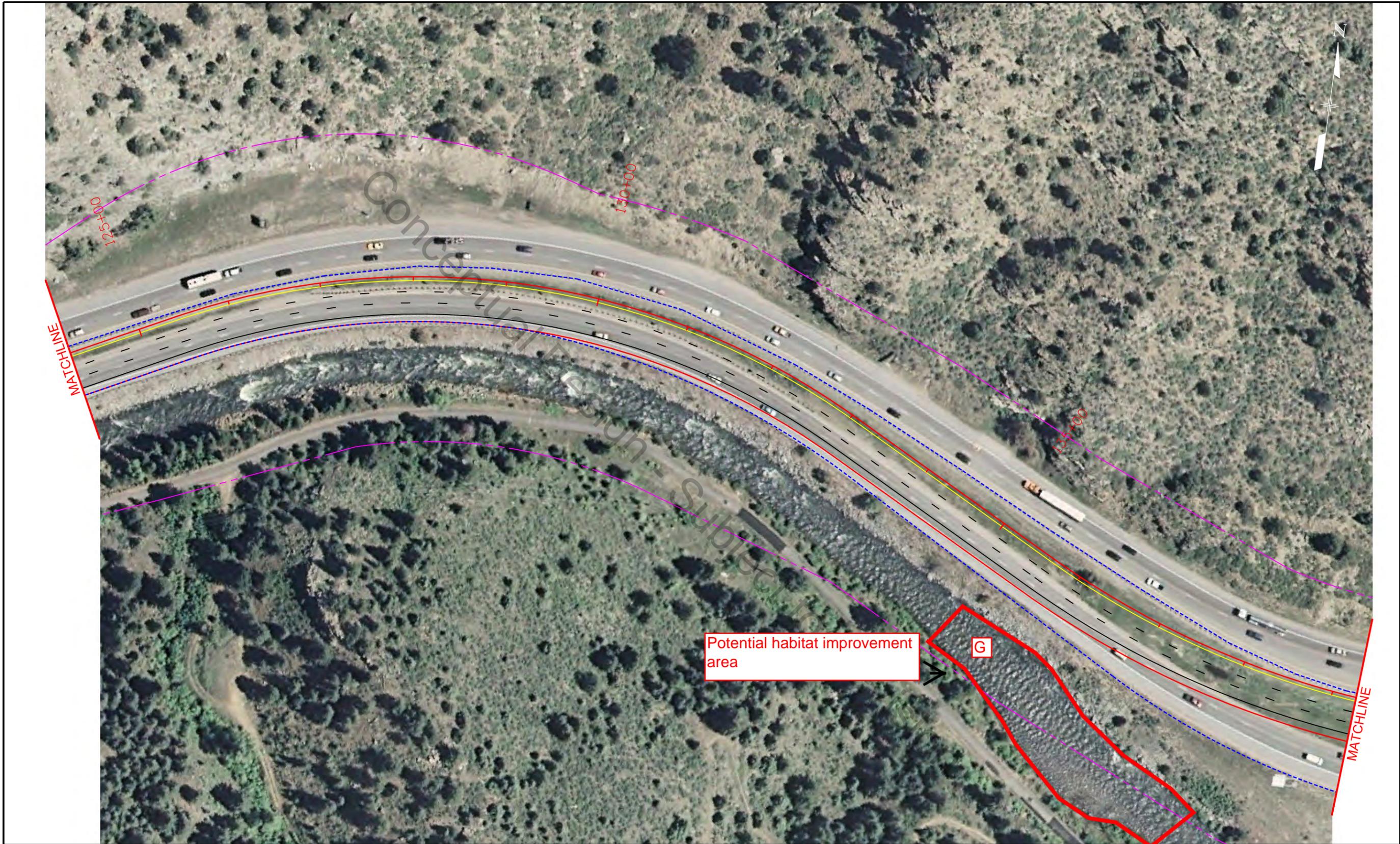


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- - - - -	Right-of-Way

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LEGEND	
---	Proposed Disturbance Limits
---	Right-of-Way

PRELIMINARY SUBJECT TO REVISION	
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Potential habitat improvement area

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