

Carbondale to Crested Butte Trail Study

Re: Public Comments from Pitkin County Healthy Rivers

On September 28, 2017, Lisa Tasker on behalf of the Pitkin County Healthy Rivers and Streams Board, submitted a letter to Pitkin County Open Space and Trails (OST), requesting additional information regarding potential impacts to aquatic resources from the Carbondale to Crested Butte trail. Below is a response to the topics identified in the comment letter.

Existing Stream Habitat Condition

Most of the Crystal River through the study area has been constricted by past developments, including the historic railroad grade, Highway 133, and numerous bridges. Banks are hardened and stabilized by riprap, retaining walls, and vegetated fill material. These past impacts have left the Crystal River in an impaired ecological condition through much of the study area (Roaring Fork Conservancy 2016, Beardsley and Johnson 2014).

Based on this existing stream condition, the potential impacts of trail implementation within and along the Crystal River stream channel and floodplain stem from new structures or hardening (e.g., riprap, walls, bridge abutments, or piers) that further degrade or constrict the stream channel, or result in a significant loss of wetland and riparian habitat.

The 2017 field review focused on wetlands and riparian areas where potential disturbance from the trail alternatives would be most likely: near potential bridge locations, along the actual footprint of the alignment, and in areas where construction in floodplains and stabilization of streambanks would potentially occur.

Potential Impacts of the Trail Alternatives

Thirty-one wetland and riparian areas were identified, including the high-quality areas described in the public environmental report. A modified version of Table 3 from the public report addresses presence of wetlands and riparian areas along the alternatives, and whether potential impacts would occur.

Trail Segment or Bridge Option	Alternative A	Alternative B
Bridge Option 1	<ul style="list-style-type: none"> No wetland, riparian, or in-stream impacts Existing bridge improvements 	
7 Oaks	<ul style="list-style-type: none"> No wetland or riparian impacts Wall, riprap, or piers along or within streambed About 1,300 feet along highway embankment 	<ul style="list-style-type: none"> No wetland, riparian or in-stream impacts
Crystal River Parcel	<ul style="list-style-type: none"> Wall, riprap, or piers along or within streambed About 400 feet along highway embankment 	<ul style="list-style-type: none"> Potential for moderate impact to riparian and wetland vegetation up to 0.25 acres, but can likely be reduced No in-stream impacts
Bridge Option 2	<ul style="list-style-type: none"> Potential for 0.1 acres of impact to riparian vegetation or wetlands on east bank New bridge construction Bridge width and impacts undefined 	

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Trail Segment or Bridge Option	Alternative A	Alternative B
Bridge Option 3	<ul style="list-style-type: none"> • Potential for 0.1 acres of impact to riparian vegetation or wetlands on east bank • Width and impacts of new bridge construction undefined 	
Nettle Creek	<ul style="list-style-type: none"> • No wetland or riparian impacts • Wall, riprap, or piers along or within streambed for about 1,800 feet 	<ul style="list-style-type: none"> • Alignment would follow existing trail/road and riparian vegetation removal could be avoided • No wetland impacts • No in-stream impacts
Bridge Option 4	<ul style="list-style-type: none"> • Potential for less than .01 acres of impact to narrow wetland fringe along east bank • Width and impacts of new bridge construction undefined 	
Red Wind Point	<ul style="list-style-type: none"> • No wetland or riparian impacts • Wall, riprap, or piers along or within streambed for about 1,700 feet along highway embankment 	<ul style="list-style-type: none"> • Alignment would follow existing trail/road and riparian vegetation removal and impacts to wetlands would be avoided or mitigated • No wetland impacts • No in-stream impacts
Crystal River Country Estates	<ul style="list-style-type: none"> • No wetland or riparian impacts • Wall, riprap, or piers along or within streambed for about 2,000 feet along highway embankment 	<ul style="list-style-type: none"> • Alignment would follow existing trail/road and riparian vegetation removal could be avoided • No wetland impacts • No in-stream impacts
Bridge Option 5	<ul style="list-style-type: none"> • No wetland or riparian impacts • Width and impacts of new bridge construction undefined 	
Bridge Option 6	<ul style="list-style-type: none"> • No wetland or riparian impacts • Width and impacts of new bridge construction undefined 	
Andrews	<ul style="list-style-type: none"> • No wetland impacts • Potential impact to 0.07 acres of riparian vegetation • Wall, riprap, or piers along or within streambed for about 1,000 feet along highway embankment 	<ul style="list-style-type: none"> • Potential impacts to less than 0.01 acres of riparian vegetation • No wetland impacts • No in-stream impacts
Bridge Option 7	<ul style="list-style-type: none"> • Potential impact to less than .01 acres of riparian vegetation and possible fringe wetland on east bank • Width and impacts of new bridge construction undefined 	
Perham	<ul style="list-style-type: none"> • No wetland impacts • Wall, riprap, or piers along or within streambed about 1,000 feet along highway embankment 	<ul style="list-style-type: none"> • Potential riparian vegetation disturbance up to 0.05 acres • Alignment would follow existing trail/road and riparian vegetation removal could be avoided • No wetland impacts • No in-stream impacts
Bridge Option 8	<ul style="list-style-type: none"> • No wetland or riparian impacts • Width and impacts of new bridge construction undefined 	
Janeway North	<ul style="list-style-type: none"> • No wetland impacts • Potential riparian disturbance up to 0.04 acres • Wall, riprap, or piers along or within streambed for about 300 feet along highway embankment 	<ul style="list-style-type: none"> • Potential for up to 0.35 acre of disturbance through riparian area • Trail through high quality floodplain riparian area • Trail would minimize impacts to wetlands by remaining on existing trail/grade
Janeway South	<ul style="list-style-type: none"> • No wetland or riparian impacts 	<ul style="list-style-type: none"> • No wetland, riparian, or in-stream impacts

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Trail Segment or Bridge Option	Alternative A	Alternative B
	<ul style="list-style-type: none"> • Wall, riprap, or piers along or within streambed for about 1,500 feet along highway embankment 	
Bridge Option 9	<ul style="list-style-type: none"> • No wetland or riparian impacts • Width and impacts of new bridge construction undefined 	
Bridge Option 10	<ul style="list-style-type: none"> • No wetland or riparian habitat present • Existing bridge • No new impacts 	
Avalanche	<ul style="list-style-type: none"> • No impacts to wetlands • Potential for up to 0.4 acres of disturbance to riparian vegetation • Wall, riprap, or piers along or within streambed for about 1,900 feet along highway embankment 	<ul style="list-style-type: none"> • Potential for up to 0.04 acres of disturbance to riparian habitat from new bridge construction across Avalanche Creek • Bridge width and impacts undefined
Bridge Option 11	<ul style="list-style-type: none"> • No wetland or riparian impacts • Width and impacts of new bridge construction undefined 	
Bridge Option 12	<ul style="list-style-type: none"> • No wetland or riparian impacts • Width and impacts of new bridge construction undefined 	
Narrows	<ul style="list-style-type: none"> • Wall, riprap, or piers along or within streambed for about 2,200 feet along highway embankment 	<ul style="list-style-type: none"> • Alignment would follow existing trail/road and riparian vegetation removal would be avoided • No wetland impacts • No in-stream impacts
Filoha	<ul style="list-style-type: none"> • No wetland or riparian impacts • Wall, riprap, or piers along or within streambed for about 2,100 feet along highway embankment 	<ul style="list-style-type: none"> • Alignment would follow existing trail/road and riparian vegetation removal would be avoided • No wetland impacts • No in-stream impacts
Bridge Option 13	<ul style="list-style-type: none"> • No wetland or riparian impacts • Wall, riprap, or piers along or within streambed • Width and impacts of new bridge construction undefined 	
Wild Rose	<ul style="list-style-type: none"> • No wetland or riparian impacts • Wall, riprap, or piers along or within streambed for about 2,300 feet along highway embankment 	<ul style="list-style-type: none"> • No wetland, riparian, or in-stream impacts
Redstone	<ul style="list-style-type: none"> • No wetland, riparian, or in-stream impacts 	<ul style="list-style-type: none"> • No wetland, riparian, or in-stream impacts
Castle	<ul style="list-style-type: none"> • No wetland, riparian, or in-stream impacts 	<ul style="list-style-type: none"> • No wetland, riparian, or in-stream impacts
Hawk Creek	<ul style="list-style-type: none"> • No wetland, riparian, or in-stream impacts 	<ul style="list-style-type: none"> • No wetland, riparian, or in-stream impacts
Bridge Option 14	<ul style="list-style-type: none"> • Potential for up to 0.1 acres of disturbance to willow scrub-shrub wetland along west bank and patches of willows along east bank • Wall, riprap, or piers along or within streambed • Width and impacts of new bridge construction undefined 	
Hays Falls	<ul style="list-style-type: none"> • No wetland, riparian, or in-stream impacts 	
Bear Creek	<ul style="list-style-type: none"> • No wetland, riparian, or in-stream impacts 	<ul style="list-style-type: none"> • No wetland, riparian, or in-stream impacts
Placita	<ul style="list-style-type: none"> • No wetland, riparian, or in-stream impacts 	<ul style="list-style-type: none"> • No wetland, riparian, or in-stream impacts
McClure Pass	<ul style="list-style-type: none"> • No wetland, riparian, or in-stream impacts 	<ul style="list-style-type: none"> • No wetland, riparian, or in-stream impacts

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Trail Segment or Bridge Option	Alternative A	Alternative B
Top of McClure Pass	<ul style="list-style-type: none"> No wetland, riparian, or in-stream impacts 	<ul style="list-style-type: none"> No wetland, riparian, or in-stream impacts

Note that many of the specific impacts from trail alternatives are uncertain at this time. At this level of planning, the general types of engineered trail and bridge solutions have been identified, but specific locations and designs (i.e., retaining walls, piers, bridge span) have not been identified. These specific design features, and the specific impacts of those features, will be identified later in the process.

Summary of Impacts by Alignment Alternatives

For either trail alternative, the approximate length of the corridor is 17 miles. The impacts of each alternative (if implemented over the entire length of the study area) are summarized below.

Alternative A: Alternative A follows the existing alignment of SH 133 for its entire length. During the field review, limited native vegetation was observed in the highway right-of-way.

Anticipated impacts from Alternative A include the following:

- Existing riparian vegetation would likely be removed to make way for the trail bench, with little opportunity for revegetation and mitigation.
- Assuming a narrow trail disturbance width of up to 15 feet from centerline, the trail would disturb up to about 75 acres of vegetation throughout the corridor, most of which would be adjacent to the Crystal River.
- Challenging trail design solutions along the narrow strip between the highway and the streambank would require about 11,300 feet (2.1 miles) of new riprap, walls, piers, or other hardened structures.
- New hardened structures would further incise and degrade stream function in affected areas.
- New construction and excavation along the Crystal River streambank, and in some cases within the channel, would increase erosion and sedimentation and the potential for impacts to water quality and in-stream habitat. While these impacts would be reduced by construction timing, best management practices (BMPs) and engineered solutions, the location and extent of this impact would elevate the risk of impacts.
- However, since a significant extent of the streambank is already degraded by past development and stabilization, the overall incremental impact would still be minor.

Alternative B: Assuming that a 25-foot area would be the limits of disturbance from the center of the trail, about 50 acres of ground disturbance would occur from construction. This would be an over-estimation for either trail alternative, as both segments follow existing trails and roads for almost their entirety. Anticipated impacts from Alternative A include the following:

- Several small areas of wetland and riparian vegetation would be disturbed during construction.
- A larger extent of wetland and riparian vegetation in the Janeway North area (about 0.35 acre) would be impacted.
- Assuming a wider trail disturbance of up to 25 feet from centerline, the trail would disturb up to about 120 acres of vegetation throughout the corridor, most of which would be in upland locations.

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- Increased drainage and sedimentation would occur along the length of the trail during and immediately following construction, potentially impacting water quality and in-stream habitat. Construction BMPs and the vegetated buffer distance between the trail alignment and the Crystal River in many areas would reduce these impacts.
- Besides the localized wetland impacts described above, the overall incremental impact would be minor.

Bridges: Fourteen potential bridge locations are identified in the study area. Some are new structures, while others are adjacent to or replacements of existing bridges. To the extent that trail alignment options utilize bridges to switch between Alternative A and Alternative B segments, new bridge abutments could result in impacts to wetlands, riparian habitat, or stream function. However, the location, extent, and significance of these impacts is not known at this time, since the exact location and span length of new bridges has not been determined.

Potential Design Measures to Mitigate Impacts and Improve Stream Conditions

In some locations, trail and bridge implementation has the potential to reduce existing impacts or potentially improve stream and habitat conditions. These opportunities include:

- Avoid removal of riparian vegetation whenever possible
- Incorporate riparian and upland vegetation as appropriate into stabilization design to support and increase habitat and hydrologic balance
- Design bridges with the maximum feasible width to minimize floodplain constriction and promote channel migration, hydrological balance, and riparian habitat succession
- Replace existing narrow bridges with wider structures to withstand bankfull flows and minimize flow deflection
- Avoid and minimize the use of impermeable materials along the river bank to support hydrological balance
- Design piers and bridges so that flow deflection from pilings or structures is minimized.

In addition, there is potential to for breaching railroad grade or other confining structures at key locations (such as Red Wind Point), thus re-establishing floodplain connectivity, increasing the potential for channel migration, improving hydrologic balance, and enhancing aquatic and riparian habitat (Roaring Fork Conservancy 2016).

References

Roaring Fork Conservancy. 2016. Crystal River Management Plan. Available at: http://www.roaringfork.org/media/1352/crmp_noappendix_bleeds.pdf.

Beardsley, M. and B. Johnson. A FACStream Primer: An Overview for the Colorado Stream Mitigation Study Team. Appendix D in Roaring Fork Conservancy. 2016. Crystal River Management Plan. Available at: http://www.roaringfork.org/media/1324/appendix-d_facstream-results-for-the-crystal-river.pdf.