Appendix A.
Darby Trailhead Relocation Project

Recommended Best management Practice’s (BMPs)

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Compliance with the Clean Water Act is achieved through the proper site-specific design, implementation, and monitoring of BMPs\(^1\). **BMPs have been found effective at protecting water quality and minimizing erosion on this Forest and other areas.** The BMPs for this project include:

- Targhee RFP direction (USDA FS 1997)
- National BMPs for Water Quality Management on NFS Lands (USDA FS 2012)

The proposed action itself is actually a BMP with an objective to improve streamside conditions by relocating the trailhead. **The BMPs listed below emphasize the applicable direction and also provide project-specific information that expands on the RFP and FSH direction.**

**BMP#1 – Aquatic Influence Zone (AIZ) Considerations**
The AIZ is shown in Table 1 and Figure 1 (USDA FS 1997). The GIS coverage of this layer is located at: GIS dataserver:\ref\library\gis\r04_ctf\CTNF_CorpData.gdb\FLRMP_TargAIZ.

\(^1\) 40CFR130.2(m): Methods, measures, or practices selected by an agency to meet its nonpoint source control needs. BMPs include, but are not limited to, structural & nonstructural controls & operation & maintenance procedures. BMPs can be applied before, during, & after activities to reduce or eliminate the delivery of pollutants into waters.
Figure 1: AIZ near the Darby Creek Trailhead.

Table 1: Relevant AIZ boundary widths (from high water mark).

<table>
<thead>
<tr>
<th>Water Type</th>
<th>AIZ Width (feet): Teton Range Subsection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish-bearing stream reaches &amp; lakes</td>
<td>300 feet, each side</td>
</tr>
<tr>
<td>Perennial non-fish bearing stream reaches</td>
<td>150 feet, each side</td>
</tr>
<tr>
<td>Reservoirs, ponds, and wetlands greater than one acre</td>
<td>150 feet</td>
</tr>
<tr>
<td>Intermittent streams and wetlands less than one acre</td>
<td>100 feet, each side</td>
</tr>
</tbody>
</table>

**Site-Specific AIZ Measures:**

Trail bridges: Replace the two trail bridges located near the existing trailhead: one on Darby Creek (Photo 1) and the second on a tributary stream located between the existing trailhead and Darby Creek Bridge (Photo 2).

- **Darby Creek Bridge:** The existing bridge is 23 feet. Span of 45 to 50 feet to accommodate the expected flow and debris.
- **Tributary Bridge:** A hydrologist or fisheries biologist, and an engineer, shall field-verify the most suitable crossing location and type. The bridge span needs to be field verified, but a 15 foot span should be close to what is needed. Evaluate relocating the crossing upstream on the tributary in order to increase the vegetative buffer between the trail and Darby Creek.
Bank Stabilization: Approximately 100 feet of streambank at the existing trailhead is eroding due to the lack of vegetation. There is adequate vegetation immediately upstream and downstream of the trailhead (see Figure 1). Use heavy equipment to reshape the streambank. Build a 10-15 foot wide floodplain bench. Armor the bench with logs, root wads, and whole willow transplants gather nearby. Relocate trail away from Darby Creek in between this bank and the Darby Creek trail bridge (see Figure 2).
**Figure 2:** Evaluate the possible trail reroute to increase the buffer between the trail and Darby Creek.

**BMP#2 – Trail Construction Measures**

- Follow the methods in FSH 2309.18 (Chap. 3) for trail preconstruction and construction. Proper design measures for the location, alignment, grade, switchback & climbing turns, stream crossings, and drainage features are extremely important for minimizing erosion.

- The “frequency of cross drains” exhibit from FSH 2309.18 (chap. 3) is made site-specific based on soil types in the area. The maximum spacing of drainage structures (e.g. waterbars, grade sags/reversals,) are shown below. Trail Grades should not exceed 10%:

<table>
<thead>
<tr>
<th>Trail Grade (%)</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Drainage spacing (feet)</td>
<td>350</td>
<td>150</td>
<td>100</td>
<td>75</td>
<td>50</td>
</tr>
</tbody>
</table>

- Do not place drainage features where they discharge onto erodible slopes or into streams.

- Construction shall occur during times when precipitation events are unlikely to occur.

**Trailhead Measures:**

A hydrologist or soil scientist should be consulted for site-specific erosion and water control designs prior to construction. Objectives for stormwater management include:

- Grade the parking area(s) to direct runoff away from sensitive areas (e.g. Darby Creek).
- Stabilize disturbed areas with wood-straw or other immediate ground cover.
- Revegetation efforts should occur immediately after construction.
- Construction shall occur during times when precipitation events are unlikely to occur.

**BMP#3 – Obliteration of Unnecessary Roads and Trails**

Fully obliterate all unnecessary routes. Obliterate means to un-build, decommission, deactivate, or dismantle a route; the denial of use, elimination of the travel way functionality, and removal of the route from the forest transportation system; return of the route corridor to resource production (USDA FS 1996). A hydrologist, Fisheries Biologist, or Soil Scientist will assist in this work to identify specific measures. A track hoe with a live hydraulic thumb typically works best. Obliteration work would include, but may not be limited to:

- Deep ripping and roughening of the surface to reduce soil compaction (2-3 feet).
- Remove the route footprint. Re-contour disturbed areas to restore the natural drainage patterns and contour of the surrounding land as much as practical. This includes pulling material from the fill slope and brow of the cut-slope onto the running surface. Where full re-contouring is not practicable, out-slope the route, pullback side-cast material, and scarify the route.
- Remove all culverts and other drainage structures. Remove fill at stream crossings.
- Provide for erosion protection by establishing ground cover that mimics background vegetation levels. This includes the placement of slash, woody debris, stumps, logs, trees, or other organic material onto the disturbed surface. Trees may be tipped over and placed on the disturbed areas. Scatter small and large woody debris on the road surface to.

**Examples of road obliteration from Merril & Casaday (2001):**

![Diagram of road obliteration](https://www.parks.ca.gov/pages/23071/files/field%20techniques%20for%20road%20removal%20app.pdf)

**Helpful Obliteration Resources:**

- Field techniques for forest and range road removal (Merrill & Casaday 2001).
- A guide for road closure and obliteration in the Forest Service (USDA FS 1996).
- Road closure and obliteration techniques, Uinta NF. (Davidson & Page).
BMP#3 – Watershed Improvement Inventory
The proposed action is a watershed improvement project. The project would provide up to 3 acres towards the Forest’s annual watershed improvement target: 1 acre for road obliteration; 1 acre for streambank stabilization, and 1 acre for trail bridge replacements.

Applicable RFP Guidelines for the AIZ (pg. III-110 & 111):
• No new roads, trails… will be constructed within the AIZ until appropriate standards for construction, maintenance, and operations are in place.

• Improve, seasonally close, close, relocate and stabilize, or obliterate roads and trails that have been identified as posing a high risk of causing unnaturally high levels of sediment input or are known to be doing so. Action to be taken will be determined based on travel management needs, terrain, the need for the road or trail, the potential environmental impacts, and resource priorities.

• Roads and trails or sections of them that have been identified as inhibiting riparian, wetland or aquatic ecosystem processes and/or functions… will be improved, relocated, or obliterated. The decision to improve, relocate, or obliterate will be based on the potential environmental impact, the ecological condition of the riparian, wetland and aquatic resources affected, and the need for the road or trail.

• Stream crossings found to pose a risk to riparian, wetland or aquatic conditions will be improved to accommodate at least a 50-year flood, including associated bedload and debris.

• New stream crossings will be constructed and maintained to prevent diversion of streamflow out of the channel and down the road in case of failure. In locations found to have high potential for failure, the roadway will be hardened to further lessen the chance of roadway failure or severe erosion should the crossing over-top.

• Construct, reconstruct, and maintain all… trail crossings of streams which currently or historically bear fish to provide for fish passage. Exceptions are allowed where it is necessary to restrict fish movements in order to protect native or desirable nonnative fish populations.