

Hartland Diversion Dam Fish Passage Modification

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Hartland Generated Problems

- Fragments habitat for aquatic wildlife, blocks movement of all fish species and causes reduced upstream population density of the three targeted species (roundtail chub, flannelmouth sucker, and bluehead sucker)
- Contributes to river instability and exposes adjacent landowner property to excessive erosion that results in a direct threat to electrical service to all of North Delta
- Presents a significant boat passage hazard that threatens human life resulting in private property trespass issues

Target Fish



Current Diversion Dam



**EXTREME
DANGER**
WATERFALL 2 MI.
EXIT RIVER NOW !!!



Project Objectives

- Maintain Hartland Irrigation Company's senior decree while reducing liability and decreasing maintenance costs
- Increasing habitat connectivity and total numbers of the target species upstream of the current dam – potential improved aquatic habitat extends throughout the Black Canyon of the Gunnison National Park, and the Gunnison Gorge National Conservation Area to the dam downstream of the Crystal Reservoir, and throughout the North Fork of the Gunnison to the Paonia Reservoir encompassing approximately 230 river miles
- Increased river system stability by returning the river morphology to a more natural state and stabilization of the downstream river banks
- Reduce trespassing and protect adjacent landowner from liability
- Reducing danger to boaters

Project Benefits

- Maintenance of agricultural water availability by honoring Hartland Irrigation Company's senior water rights
- Access to historic habitat to benefit native fish populations
- Removing blockage of fish caused by the Hartland Dam will reconnect up- and downstream metapopulations, which is beneficial to the target species
- Increased upstream population density for the species of concern and other Colorado native aquatic species
- Increased biodiversity (i.e., healthy fish populations lead to increased raptor and mammal populations that depend on fish)
- Reduced trespassing on private property
- Improved navigation and increased boater safety
- Economic development for local communities related to recreation opportunities (e.g., boating, sport fishing, etc.)

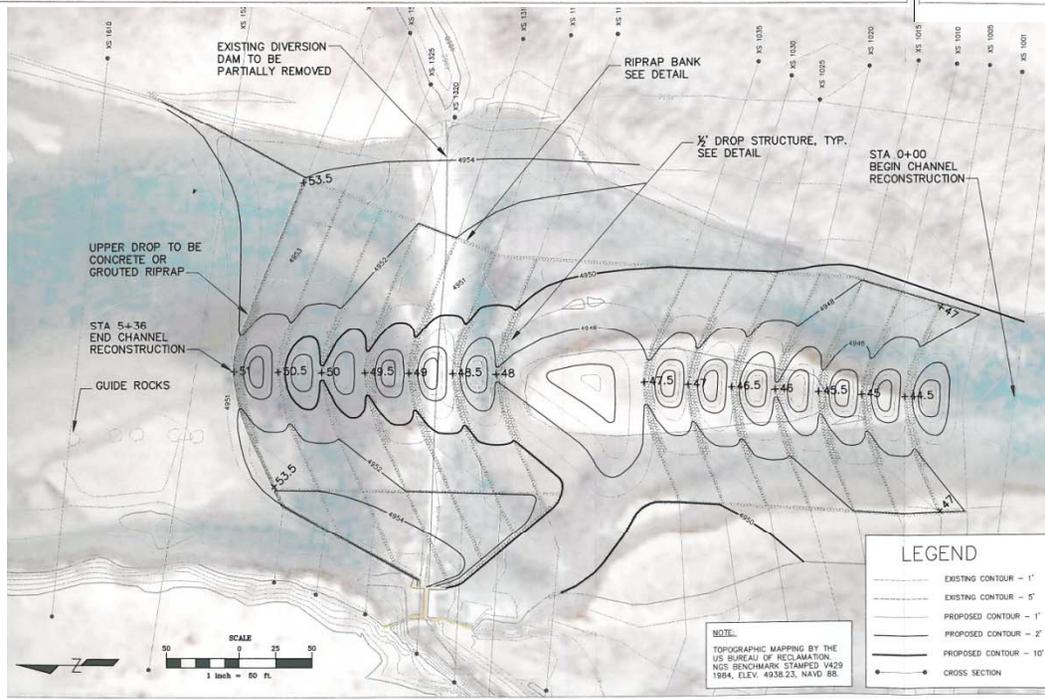
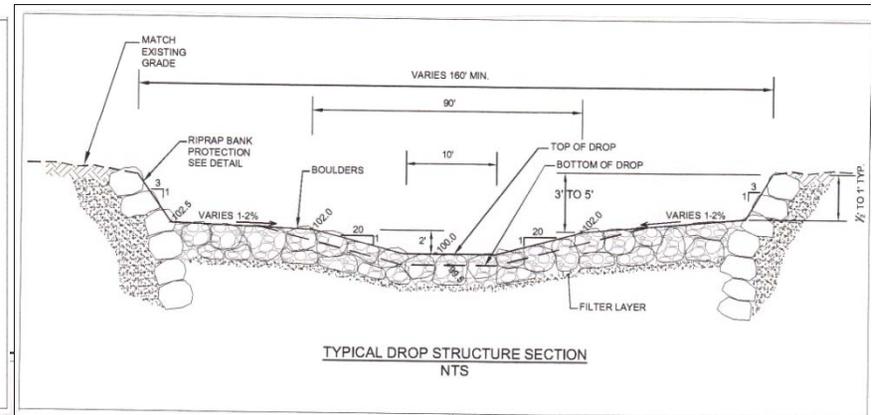
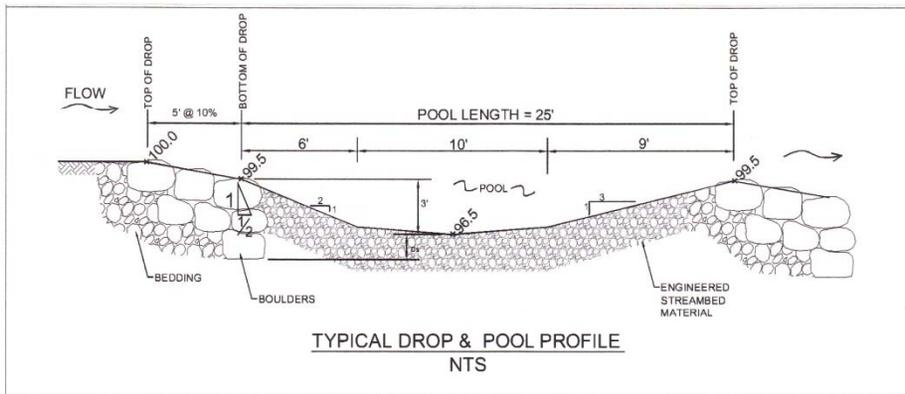
Project Status

- Conceptual design completed December 2009
- Funding to cover Conceptual Design cost estimate secured February 2010
- Final design started late March 2010
- Site preparation started March 2010
- Construction materials source identification and evaluation started March 2010

Fish Specific Design Criteria

- Maximum vertical height drop at the chutes of 0.5 feet
- Maximum velocities at the toe of drops of 4 feet per second
- Maximum burst time in high-velocity areas of 3 to 5 seconds
- Minimum 2 feet water depth
- Maximum velocities in the pools of 2 feet per second
- Typically greater than 2 feet depth in the pools
- 20 feet minimum pool length

Conceptual Design



Future Project Schedule

- Complete initial site preparation early May 2010
- Start staging construction materials May 2010
- Complete final design effort mid-June
- Compete and award construction contract by August 1st
- Complete EA process mid-June
- Complete 404 permitting process early August 2010
- Start construction mid- to late August 2010
- Complete construction by October 2010
- Start rehabilitation of bank area September 2010
- Complete replanting and final project report May 2011