

Summary submitted for WIRE March 2008

Lower Henrys Fork Fish Passage Assessment

The Lower Henrys Fork subwatershed contains the majority of the dams and diversions in the Henrys Fork drainage (Figure 1 attached). A complete fish passage inventory of irrigation and hydropower diversions and canals has never been completed for the mainstems of the Lower Henrys Fork, Fall River, or Conant and Squirrel creeks. Previous studies of fish passage have focused only on a few canals on the Lower Henrys Fork and Fall River, making it impossible to assess all 19 irrigation canals and related infrastructures on these rivers. Furthermore, there has never been a fish passage assessment of irrigation diversions on Conant Creek (the major tributary of the lower Fall River) or its primary tributary, Squirrel Creek.

The passage of fish either upstream or downstream can be affected by infrastructures, i.e., dams, diversions, and canals along streams and rivers. Fishes in mainstem rivers can be highly migratory, capable of moving long distances within waterways to find the habitat they need for spawning, summer rearing, and winter refuge. Connection of fish to these different types of habitat plays a large role in determining how many fish will be found in a given part of a stream or river.

Fish passage has been the primary emphasis of a couple of ongoing projects within the lower Henrys Fork subwatershed. First, an HFF and IDFG radio telemetry study of adult rainbow trout and brown trout has been underway since 2006. This study is evaluating how these trout move within the Henrys Fork from Chester Dam to St. Anthony in relation to small diversion dams. A small percentage of adult fish have moved either upstream, downstream, or both in relation to the smaller dams, but no trout moved upstream past Chester Dam. However, a hydropower project proposed on the Chester Dam, and as modified in a settlement agreement, would improve both upstream and downstream fish passage at the dam. This hydropower project, including the fish passage improvements, is dependent upon the Federal Energy Regulatory Commission issuing a hydropower license, which should be forthcoming soon.

The proposed Fish Passage Assessment is the next step in determining the presence and extent of fish barriers within the Lower Henrys Fork subwatershed. This basic information will be used to formulate a design for more intensive study of how fish may be affected by fish barriers and the potential cumulative effects upon fish populations. The assessment will also be used to identify opportunities to restore connectivity between the mainstem rivers and streams and headwater habitat and fish. Long-term solutions that provide for both supplying irrigation water and supporting fish passage will benefit river and stream users and the local economy.

Objectives:

1. Comprehensively assess all potential fish passage impediments in the Henrys Fork and Fall River (and its tributaries).
2. Evaluate the individual and cumulative effects of fish passage impediments.
3. Provide a framework for future research related to understanding the effects of fish passage on fish populations.
4. Evaluate options for fish passage improvements.
5. Develop working relationships with canal companies and landowners.

Methods: HFF & IDFG will present the Fish Passage Assessment project, ask for input and advice, and seek approval to proceed at a meeting with canal company representatives that will be organized by the Fremont-Madison Irrigation District in April. If canal companies approve of the on-the-ground

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inventory of their infrastructure, then they will be invited to assist with data collections during the summer.

The Fish Passage Assessment will utilize three types of information: 1) an analysis of water flow data for the Henrys Fork and Fall River and the canals that originate there; 2) an on-the-ground inventory of infrastructure; and 3) fish collected from a subsample of canals.

The water flow analysis utilizes river and canal flow data from 1972 to 2005 for the Henrys Fork and Fall River. This analysis includes the flow magnitude, proportion of stream flow diverted, and timing of diversions and subsequent theoretical effects upon fish entrainment into canals. A draft report has been produced by a HFF intern that will be reviewed, edited, and completed in 2008.

The on-the-ground inventory of infrastructure will take place in 2008. The first round of the inventories will occur in May (period of low water diverted into canals and high water in rivers) and then again in July (period of high water diverted into the canals and low water in the rivers). Data collected will be similar to inventories of the Upper Snake Drainage (IDFG 1997), Teton River tributaries (Friends of the Teton River 2005), and Bear River (Caribou-Targhee National Forest and Trout Unlimited 2007). Data collected may include quantitative variables such as: dam height, length, and span; jump pool depths; headgate size and number of openings; canal approach velocities, width, depth, gradient; and water velocities. Qualitative variables may include: dam materials and condition; headgate location and type; presence of flow measuring devices (Conant and Squirrel Creeks), presence of fishways and fish screens; and photos.

The water flow and inventory data will be used to place dams and canals into upstream and downstream fish passage categories: low, moderate, and high. Validation of downstream fish passage categories will be attempted by selecting one to two canals from each of the three categories for fish collection (fish collection is already conducted on the Egin Canal and therefore this canal will be excluded from sampling for this assessment). Canal companies will be contacted if their canals are selected for fish collection and asked for their permission to collect fish at the end of the irrigation season in October or November. A one- to three-pass population estimate of fishes in the canals will be made using backpack electrofishing equipment. Canal length sampled will be from the headgate downstream for a specified distance. Fish will be identified to species, measured, and then returned to river.

Products: This fish passage assessment will provide:

1. A categorization and ranking of upstream and downstream fish passage into canals based upon the inventory and the ongoing canal and river flow assessment.
2. A preliminary validation of the potential fish entrainment rankings from the end-of-season fish sampling in selected canals.
3. A knowledge framework and stratification of canals for future intensive study of fish entrainment in canals.
4. Identification and determination of priorities for fish passage improvement options within the drainages.
5. Development of a collaborative process and working relationships with canal companies that are interested in managing their diversion structures and canals to limit fish passage problems.

Dissemination of results: A final report will be completed by April 1, 2009. A presentation will be made to the canal companies to present findings, seek comments and suggestions, and identify future research or restoration options. A presentation will also be made to the Henry's Fork Watershed Council.