Hatwai Creek Fisheries and Fish Habitat Assessment

March 2014

Nez Perce Soil and Water Conservation District
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Introduction
This fisheries and fish habitat document follows the five steps outlined in section IX Fish and Fish Habitat Assessment of the Oregon Watershed Assessment Manual (Network, 1999).

This assessment is based on two assumptions:

- Salmonid fish are typically the most sensitive fish species occurring within a stream network. If habitat conditions are suitable for salmonid fish, then they reflect “good” habitat.

- Fish distribution is a function of the quantity and quality of habitat types available in the watershed. Channel Habitat Types (CHTs) have predictable habitat conditions that influence the potential fish use within a stream reach. The distribution of fish species in a watershed is a function of the distribution and condition of the CHTs found there.

Watershed Description
Hatwai Creek is a third-order tributary of the Clearwater River. It is a relatively small subwatershed, encompassing 20,935 acres. The majority of the acreage in the watershed is cropland and rangeland, while the remainder is used for pastureland, suburban dwellings, and industrial warehousing. The main stem of Hatwai Creek originates on the southern breaks of the Palouse prairie, along the east side of Idaho State Highway 95, flowing south into a steep basalt canyon where it is fed by several springs before reaching the Clearwater River three miles east of Lewiston, Idaho. Elevation in the watershed ranges from near 3,000 feet above sea level at the headwaters to below 800 feet at the mouth.

Historically, the Clearwater and Salmon Rivers produced large runs of anadromous fish, accounting for the largest percentage of anadromous fish in the Columbia River system (Kucera et al 1983). Rapid changes in land use, land ownership, urbanization and especially hydroelectric power production reduced these runs to a fraction of their historic numbers.

Currently, much of the Lower Clearwater Subbasin is federally listed as critical habitat for the ESA threatened Snake River Steelhead (*Oncorhynchus mykiss*) and Snake River Fall Chinook (*Oncorhynchus tshawytscha*) salmon, although Chinook are thought to use the main Clearwater River for spawning rather than the lower tributaries. The Interior Columbia Technical Recovery Team (consortium of scientists) identifies the Lower Clearwater River and its tributaries as among the few areas in the Snake River basin having predominantly wild steelhead production with limited hatchery influence. The ICTRT also identifies several Lower Clearwater tributaries, including Hatwai Creek, as having a “high intrinsic potential” for supporting salmonid spawning and rearing (NMFS 2006).

Step 1: Identify Fish Species and Populations
Fish density and distribution studies conducted by the Idaho Department of Fish and Game (IDFG) found the following fish species in Hatwai Creek: steelhead trout, chiselmouth, speckled dace, sucker. The IDFG sampled one site on Hatwai Creek in April and again in October 1994. The site yielded steelhead densities of 0.013 steelhead caught per unit effort, or 0.013 steelhead per second of electrofishing. The study states that these findings are similar to densities found in “several other area creeks” (IDFG 1994).
Table 1. Fish Species Identified in Hatwai Creek

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Genus species</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steelhead/Rainbow Trout</td>
<td><em>Oncorhynchus mykiss</em></td>
<td>Native</td>
</tr>
<tr>
<td>Chiselmouth</td>
<td><em>Acrocheilus alutaceus</em></td>
<td>Native</td>
</tr>
<tr>
<td>Speckled Dace</td>
<td><em>Rhinichthys osculus</em></td>
<td>Native</td>
</tr>
<tr>
<td>Sucker (non-specific)</td>
<td><em>Catostomus spp.</em></td>
<td>Native</td>
</tr>
</tbody>
</table>

**Stocking History**

The goal of this section is to identify the species that were stocked in the watershed and how extensive the stocking efforts were. Stocking data was found by contacting the Nez Perce Tribe and Idaho Department of Fish and Game. No knowledge of stocking in the Hatwai Creek watershed was found.

Artificial propagation programs for steelhead in the Clearwater River basin are based on the North Fork Clearwater stock which was trapped at the foot of Dworshak Dam when that USACE project blocked access to the North Fork in 1969. The Dworshak National Fish Hatchery (NFH) has produced 2.3 million steelhead smolts annually most years since the early 1970s. About 1.2 million smolts are released direct from the hatchery located at the mouth of the North Fork at approximately Clearwater River mile 40 and the remaining 1.1 million are released off-station. Dworshak NFH supplies fertilized eggs to Clearwater Hatchery which produces 1.04 million smolts that are released in the South Fork Clearwater (including Crooked and Red rivers) for fishery mitigation and in an experimental attempt to reestablish a natural spawning population in an area which had been blocked by dams in the last century. Hatchery-origin steelhead are rarely observed in the important production areas in the Lochsa and Selway rivers or in the lower Clearwater River tributaries and are not believed to influence the natural populations (NOAA Clearwater River Steelhead MPG).

**Life History Patterns, Important Habitat Areas**

This section documents the timing of anadromous and resident fish spawning and mitigation. The information is useful in determining how and when fish use specific portions of the watershed. Table 2 summarizes the findings.

Steelhead spawn in streams from mid-April to late June. They use areas of gravel, or cobble, in which to make a redd, or nest for their eggs. The female selects a place in a riffle area below a pool to dig a redd (nest). She displaces the gravel with her body and tail, and the male fertilizes the eggs as they are deposited. The female covers the eggs with gravel by continuing upstream and the current carries the gravel over the eggs.

The eggs hatch in early to midsummer. The young fish are usually reared in the stream for two years before migrating to the ocean. Juvenile fish that migrate to the ocean will grow rapidly.

When they mature and are ready to spawn, the steelhead migrate back to the place they were born. They enter the lower river drainages in the fall (Sept.-Oct.) and winter over to spawn the following spring. Most steelhead require 3 to 5 years to mature (IDFG Website 11/19/2012) [http://fishandgame.idaho.gov/public/fish/?getPage=314](http://fishandgame.idaho.gov/public/fish/?getPage=314).

The Clearwater Basin has two distinct runs of returning adult steelhead. The A-run steelhead return after spending one year in the ocean, and the B-run steelhead return after spending 2 to 3 years in the ocean. A-run fish begin returning earlier in the summer, late July through August, and average around 6 pounds. B-run fish return primarily to the Clearwater River and its major tributaries, like the South Fork Clearwater River. B-run fish begin returning in early fall, and are significantly larger, averaging 10 to 13 pounds, with some weighing over 25 pounds.
Table 2. Hatwai Creek Fish Spawning Summary

<table>
<thead>
<tr>
<th>Species</th>
<th>A-Anadromous R-Resident</th>
<th>Location</th>
<th>Spawning</th>
<th>Outmigration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinook</td>
<td>A-fall</td>
<td>Mainstem Hatwai</td>
<td>Oct. to Jan., peak Nov.</td>
<td>June/July to estuary summer/fall to ocean as under yearling smelts</td>
</tr>
<tr>
<td>Coho</td>
<td>A-fall</td>
<td>Low-gradient tributaries</td>
<td>Nov. to Feb.</td>
<td>Second spring after hatching, peak in May; limited estuary time</td>
</tr>
<tr>
<td>Cutthroat</td>
<td>A-summer/fall R-fluvial</td>
<td>First and second order tributaries</td>
<td>Dec., peaks in Feb.²</td>
<td>Age 1+ and 2+ fish outmigrate April or May to estuary/tidewater. Age three fish go to ocean in May. Adults overwinter in estuaries of origin²</td>
</tr>
</tbody>
</table>

Step 2: Create Fish Distribution Maps

The base map used to create the fish distribution maps is Figure 1. The maps illustrate where the technical team believes fish habitat is likely to occur. Criteria includes upper slope limit of 20% (so channel slope does not exceed 20%). The redistributed hydrology map (Teasdale, 2014) was used to identify the perennial streams and then known passage barriers were identified.
Step 3: Complete Habitat Condition Summary

Habitat condition was completed using the Stream Assessment Methodology. A stream assessment was used to evaluate many of the stream physical habitat parameters that are crucial to supporting aquatic life. The assessment incorporates the USDA Stream Visual Assessment Protocol (SVAP), a Stream Erosion Condition Inventory (SEC) and techniques from Rosgen Stream Channel Classification. The 14-parameter SVAP protocol was the primary aspect used for the physical habitat portion of the prioritization, although not all 14 parameters were included; the parameters used were: Channel Condition, Hydrologic Alteration, Riparian Zone, Bank Stability, Water Appearance, Nutrient Enrichment, Fish Barriers, In-stream Fish Cover, Canopy Cover, Pool Habitat, Insect Habitat and Manure Presence. Stream assessment findings were compiled into a report Lower Canyon Tributaries Inventory and Assessment (Dau & Rasmussen, 2014).

The Hatwai Creek watershed was divided into reaches. Reach designations were made based on geographic location, stream type, slope, soil type, and land cover. Teams consisting of two to four people specializing in soils, fisheries, range, botany, engineering, and water quality completed each inventory. 66 miles of stream were inventoried and the NPSWCD coordinated with 50 landowners prior to field data collection.

The Lower Canyon Tributaries Stream Inventory and Assessment concluded that 32.78 miles were in poor, 14.03 miles were in fair, 17.70 miles were in good, and 1.56 were in excellent condition.

Reaches within areas of perennial flow that received a rating of poor or fair were considered priorities for restoration actions.
Source: Generated by Kayla Da. Nez Perce Soil and Water Conservation District. Lower Canyon Tributaries Stream Inventory and Assessment Report. (Da., 2018). Analysis: A stream inventory was completed by collecting field data for 14 parameters each stream reach was assigned an index rating calculated by totaling the values of all criteria evaluated and dividing by the number of criteria evaluated. This resulted in assigning a rating of excellent, good, fair, poor to each stream reach.
Stream Temperature

Water temperature data was collected on four sites within the watershed in each of the following years: 1997, 1998, 2001, 2003, 2004, 2005, 2006, 2007, 2008 and 2011. Data is summarized in the Hatwai Creek Stream Temperature & Turbididty Monitoring (Fales, et al., 2014). Data collection followed the Protocol for Deployment and Retrieval for Stream Temperature Monitoring within the Nez Perce Soil Water Conservation District (NPSWCD, 2010). Generally, temperature loggers are placed in stream in March or early April and collected in November. For each monitoring year, the maximum, minimum and daily average temperatures were analyzed and the number of times temperatures exceeded each criterion was determined. For all data sets, no matter the year, the salmonid spawning 9°C daily average temperature was exceeded nearly every day during the critical time period (Fales, et al., 2014).

Step 4: Migration Barrier Identification

Migration barriers were identified from a variety of efforts as described below:

**Lower Canyon Tributaries Road Inventory and Assessment Report (Hall, 2014).**

This report uses GIS to identify stream and road intersections. 62 intersections were identified with 15 sites receiving a high priority for further evaluation due to their location along perennial stream segments and 47 receiving a moderate priority due to their locations on intermittent stream segments.

**Hydrology Analysis (Teasdale, 2014).**

This report completes a channel slope analysis which identifies any channels exceeding 20% (the upper limit for steelhead migration). No miles were found to meet this criteria. In addition, several of the structures were evaluated for hydrological modeling purposes. This resulted in seven barriers identified.

**LCRT Stream Inventory and Assessment (Dau & Rasmussen, 2014).**

Includes information for potential barriers as well. During the data collection phase of this effort, Bedrock Creek’s streams were physically inventoried. During the process, barriers were identified.

As some of these barriers are reported in multiple reports, the barriers were summarized in Table 5 which identifies the barrier source. A KMZ file is available for upload at HatwaiCreekFishHabitatDataLayers. The file contains fish passage barrier locations.

In 2013, the NPSWCD conducted a survey of passage barriers within the Hatwai Creek watershed and found a total of three barriers including two culverts which block passage year round where the third barrier is considered seasonal. The man-made barriers are blocking 7.12 miles of habitat.

**Recommendations:**

The reports identified 13 barriers within the watershed. Table 5 identifies the type of barrier miles of habitat blocked, and the locations of these barriers. Two barriers are identified for treatment and are those associated with bridges, culverts, and rocked crossings.
In conclusion, 11 barriers were identified blocking an estimated 11 miles of habitat.

Barriers need field evaluations prior to installation. Treatment is recommended on perennial reaches first starting at downstream acres then merging upstream where feasible.
References