

Fisheries Habitat Evaluation – Unnamed Tributary to Scoggins Creek Below Scoggins Dam

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Introduction

The U.S. Bureau of Reclamation (BOR) is the owner of Scoggins Dam, which was completed in 1975 and is on Scoggins Creek, a tributary of the Tualatin River. Hagg Lake, with a storage capacity of 53,600-acre feet, is the impoundment created by Scoggins Dam. Hagg Lake water is currently used for river flow augmentation, municipal water supply and agricultural irrigation needs throughout the watershed. The Lake has park and recreation facilities operated by Washington County.

The BOR is currently evaluating the feasibility of raising Scoggins Dam by 20-feet or 40-feet. In addition, as part of the feasibility evaluation, there is a potential that the spillway of the dam may be relocated and discharge into an unnamed tributary to Scoggins Creek. The spillway of the dam currently discharges to the existing Scoggins Creek. If relocated, the dam spillway would discharge to a small unnamed tributary stream (tributary) that confluence's Scoggins Creek from the north approximately 0.2 miles (1,056 feet) downstream of Scoggins Dam (Figure 1). This tributary currently has an approximate average bankfull width of between 6 and 8 feet and bankfull depth of approximately 3 feet in the lower reaches of the stream from the Scoggins Valley Road crossing downstream to its confluence with Scoggins Creek. The tributary drains a mostly forested basin to the north of Hagg Lake.

A Water Supply Feasibility Study is being completed to address various aspects of raising Scoggins Dam, including the effects on fisheries habitat in Scoggins Creek below the dam. Initially the Water Supply Feasibility Study did not include a fisheries assessment of the tributary. However, potential design changes to the spillway of Scoggins Dam are being evaluated. The purpose of this report is to document the existing habitat characteristics and to provide a subjective habitat rating of the tributary. This information will be used to further refine the design of the Scoggins Dam spillway.

Methods

A reconnaissance survey of the tributary was conducted on April 9, 2003. Site specific stream data were collected and recorded on habitat survey data sheets. The data sheets are found in Appendix A. The data sheets characterize aquatic habitat conditions by the use of

19 different subjective ratings (including aquatic invertebrate production, roadbank erosion, and bedload) based on preferences of salmonid species. The subjective ratings provide an opportunity to document specific stream characteristics and how they contribute to, or affect, salmonid habitat.

Subjective ratings of *Excellent*, *Good*, *Fair*, or *Poor* were based on stream and riparian conditions including, substrate types, embeddedness, habitat types and abundance, riparian cover, large woody debris presence and potential, spawning gravel quality and abundance, and limiting factors such as suggestion of nutrient loads, temperature sensitivity, macroinvertebrate production, passage barriers, stream condition trend (deteriorating, static, increasing), and erosion.

Fisheries Resources In The Project Area

Scoggins Creek, below Scoggins Dam, potentially supports anadromous species (coho salmon and steelhead trout). Upstream of Scoggins Dam resident species include cutthroat and rainbow trout. Hagg Lake supports a recreational fishery of rainbow trout as well as warmwater game fish. The tributary to Scoggins Creek below the dam could potentially support resident and anadromous species, however there are impassable fish barriers located downstream of the Scoggins Valley Road crossing. There are also other potentially limited factors to the support and production of anadromous species in the tributary. These limiting factors are discussed in the sections below. The following discussion of existing aquatic habitat conditions and limiting factors for salmonids is based upon habitat survey documentation and observations made during the reconnaissance survey.

Habitat Characteristics of the Tributary to Scoggins Creek

The fisheries habitat of Scoggins Creek downstream of Scoggins Dam was described as part of the Water Supply Feasibility Study. Scoggins Creek was given a subjective rating of “*Poor*” to “*Poor to Fair*” based on the primary limiting factors for salmonids in Scoggins Creek which include spawning areas, pool and riffle abundance, presence of undercut banks, aquatic invertebrate production, bank cover, and instream structure which were rated *Poor* during the field survey. The reconnaissance survey of the tributary revealed two distinct reaches based on habitat characteristics and manmade structures (road crossings). Flow in the mainstem Scoggins Creek below the dam at the time of the reconnaissance survey was 11 cubic feet per second (cfs). The flow of the tributary was estimated to be 3 cfs (at the BOR road crossing). The following discussion describes the habitat characteristics of the two reaches of the tributary.

Reach 1

Reach 1 extends from the confluence of the tributary with Scoggins Creek, approximately 1,470 feet upstream to the BOR road crossing. The reach has a low gradient (from 1 to 2 percent). This reach is approximately 85 percent glide and 14 percent riffle, with very little pool habitat. The main understory and overstory consist primarily of various grasses and Reed Canary Grass with limited scattered trees (Figure 1). Stream substrate is mostly sand and silt with some gravels. This reach appears to be artificially channelized to prevent

flooding and bank overflow in the area. Average bankful width is 6 feet and bankfull depth is 3 feet.

At the time of the reconnaissance survey, the discharge of the tributary was visibly more turbid than the mainstem Scoggins Creek, creating a plume of turbid water downstream of the confluence in Scoggins Creek. The majority of the turbidity appears to be caused by sloughing banks and headcutting approximately 100 feet upstream of the confluence (Figure 2). The headcutting creates an impassable barrier to at least resident fish. The headcut, or step, is approximately 4 feet high and is likely caused by active headcutting of the tributary. Headcutting is a unique process by which the channel downcuts (degrading) in a downstream to upstream process. Upstream of the headcut, the instream substrate is dominated by gravel. Instream vegetation, dominated by grasses, also begin to appear and continue throughout the reach. The remainder of the reach does not experience visible bank sloughing.

Approximately 985 feet upstream the channel bends to the north over a small 1.5 feet step. From this point, upstream to the end of the reach, the understory and overstory is dominated by grasses; no blackberry plants or trees exist throughout the end of the reach. The culvert located at the BOR road crossing at the end of the reach creates a potential barrier to fish passage at low flows due to a slight perch (Figure 3).

Reach 1 is a channelized reach that appears to have multiple limiting factors for use by salmonids, including temperature sensitivity, limited protection from predators (lack of overhead, or instream cover from large woody debris), as well as a lack of hydraulic diversity. Substrate conditions are also unfavorable for salmonid spawning, due to limited availability of appropriately sized gravels. As a result of these aquatic habitat conditions, the overall subjective rating in Reach 1 is *Poor*.

Reach 2

Reach 2 of the tributary originates at the BOR crossing and extends approximately 1,420 feet upstream to the Scoggins Valley Road crossing. The reach has a gradient of approximately 1.5 percent overall. Reach 2 is not channelized unlike Reach 1, containing an increase in the variety of habitat. The instream substrate contains a mix of sand/silt, gravel, and rubble, with some cobble. The dominant understory in the first half of the reach is mostly blackberry, and the second half of the reach is mostly grasses and snowberry. The dominant overstory in the first half of this reach is blackberry, and the second half is alder trees. Average bankful width is 8 feet and bankfull depth is 2.5 feet.

This reach has increased instream habitat diversity, as well as riparian vegetation and higher canopy cover as compared to Reach 1. As a result, Reach 2 is less temperature sensitive than Reach 1. The reach contains two potential impassable barriers. The first is a day-lighting pipe located approximately 350 feet upstream of the BOR crossing. The second is the culvert at the Scroggins Valley Road crossing (Figure 4). The gradient of the culvert is approximately 3 to 4 percent creating an upstream passage barrier.

The overall subjective rating for habitat conditions in Scoggins Creek Reach 2 is *Fair to Good*, resulting primarily from the lack of undercut banks, large woody debris cover, habitat diversity, and the impassable fish barriers. Instream habitat consisted primarily of riffle (64 percent). The lack of habitat diversity limits salmonid production directly by limiting usage

and also limits the production of macroinvertebrates favorable to salmonids as a food source .

Habitat Summary

As part of the evaluation of raising Scoggins Dam, this unnamed tributary to Scoggins Creek may potentially receive the discharge of a relocated spillway discharge. The potentially affected section of the tributary is characterized by two distinctive reaches between the Scoggins Valley Road crossing and the confluence with Scoggins Creek below the dam. Reach 1 extends from the confluence upstream to the BOR road crossing. Reach 2 extends from the BOR road crossing to the Scoggins Valley Road crossing.

Reach 1 appears to be channelized and degraded, resulting in a *Poor* rating for fisheries habitat quality. In addition, the reach contains two passage barriers. Reach 2 is less degraded than Reach 1, with an increase in riparian and instream diversity. However, Reach 2 is dominated by riffle habitat and also contains two passage barriers. Both reaches are limited by the lack of sufficient salmonid spawning habitat, sufficient instream woody debris, and habitat diversity.

Appendix A

Reconnaissance Data Sheets

FIGURE 1. CONFLUENCE OF UNNAMED TRIBUTARY AND SCOGGINS CREEK DOWNSTREAM OF SCOGGINS DAM.



FIGURE 2. UNDERSTORY AND OVERSTORY CONSISTING PRIMARILY OF VARIOUS GRASSES AND REED CANARY GRASS WITH LIMITED SCATTERED TREES.



FIGURE 3. SLOUGHING BANKS AND HEADCUTTING APPROXIMATELY 100 FEET UPSTREAM OF THE CONFLUENCE WITH SCOGGINS CREEK.



FIGURE 4. U.S. BUREAU OF RECLAMATION ROAD CROSSING AT THE END OF THE REACH 1 CREATING A POTENTIAL BARRIER TO FISH PASSAGE AT LOW FLOWS.



FIGURE 5. CULVERT AT THE SCOGGINS VALLEY ROAD CROSSING WITH A GRADIENT OF APPROXIMATELY 3 TO 4 PERCENT CREATING AN UPSTREAM PASSAGE BARRIER.

