



Wild Fish Conservancy
N O R T H W E S T
S C I E N C E E D U C A T I O N A D V O C A C Y

March 14, 2008

The Wild Fish Conservancy (WFC) performed a spawning and redd survey on Joe's Creek in Federal Way, WA on March 12, 2008 (Fig.1). The objective of the survey was to evaluate this stream reach for the presence of adult steelhead or their redds and/or carcasses. A secondary objective was to characterize salmonid species composition within the survey reach.



Fig.1. Joe's Creek Study reach in Federal Way, WA. The white arrow on the large scale map indicates the position of the point where Joe's Creek flows into Dumas Bay. The reach began near the bridge at Dash Point Road, and terminated at the Twin Lakes Golf and Country Club.

Fish Presence

WFC surveyed Joe's Creek between the mouth of the creek at Dumas Bay and the culvert at the Twin Lakes golf course's driving range covering a distance of approximately 1 river mile. Beginning at 9am, the two person survey team walked the study reach, visually surveying the stream channel for evidence of fish and spawning activity. Additionally, juvenile fish were captured periodically throughout the reach using a Kinalovka, a trapezoidal mini-seine (Fig. 2). This tool is held in place against the streambed, large wood, or the bank in different habitats and fish are herded downstream into it. All fish were identified to species and measured. Representative specimens of each species were photographed.



Fig.2. The Kinalovka trapezoidal fish collection net and typical high quality 3D habitat structure of Joe's Creek

Three fish species were observed during the survey: *O. clarki clarki* (coastal cutthroat trout) were observed throughout the reach, *O. kisutch* (coho salmon) fry were observed in a localized area mid-reach and one sculpin (*Scorpaeniformes* sp.) was found near the mouth (Fig.3).



Fig.3. Joe's Creek spiny sculpin

A total of 30 juvenile cutthroat trout were captured ranging in size from 80 to 200mm, apparently belonging to two age classes. Several larger cutthroats captured in the lowest reach of Joe's Creek appeared to be smolts, or in the process of smolting as their coloration was very silver (Fig. 4a) compared to most of the cutthroats captured (Fig.4b). Approximately half way up the reach (river mile 0.5) we captured approximately 40 young of the year coho salmon (Fig. 5) ranging from 28 to 32mm and observed a total of about 100 more coho fry using shallow water sheltered habitats. All fish captured had intact adipose fins, indicating that they were likely of natural (non-hatchery) origin. No coho were found above or below the 100m sub-reach in which the first group were found. No rainbow trout or steelhead were observed in the study reach.



Fig.4.A Silver colored cutthroat “smolt” (~180mm) and **(B)** in-stream colored “resident” (~160mm) captured in the same lower 500meters of Joes Creek on March 12, 2008



Fig.5. Coho salmon fry found at river mile 0.5 of Joe's Creek. Red ellipse on inset shows typical shallow fringe habitat where coho fry were found on the survey date.

Two definitive redd observations were made in Joe's Creek, both constructed of 1-2in. diameter gravel and finer sand. The first was small (1ft x 1ft) and was likely made by a small resident fish and located at approximately river mile 0.6. The second was larger (2ft x 4ft) and was probably made by a sea run cutthroat; the fish that created the redd was not observed. This redd was located 100m below the golf course.

Physical Habitat Characteristics

The mainstem of Joe's Creek within the survey area contains high-quality fish rearing habitat including undercut banks and large in-stream woody debris (see Fig.2). Debris jams provide three dimensional structure within the channel which is important for the creation and maintenance of diverse instream habitats including scour pools, variable depths and velocities, channel braiding, and shallow fringe habitat. The substrate is composed primarily of gravel suitable for salmonid spawning with lateral habitats containing finer substrate. The mainstem channel within the study area had a wetted width of approximately 6-8 ft., and a bankfull width of 10-12 ft. At the stream flow stage observed at the time of the survey, passage of large fish such as steelhead between deeper pools may be difficult due to very shallow riffles; however during freshets it is likely that larger bodied salmonids could easily navigate the reach. No obvious structural barriers to fish passage were observed below the Twin Lakes golf course where large introduced cobble, high gradient, and an impassible water transfer structure prevent upstream fish movement (Fig.6.A-C). No fish were captured beyond the point where the stream passes the golf course (Fig.6.A) and is pumped underground (Fig.6.B).



Fig.6.A Open canopy restoration area near Twin Lakes golf course and **(B)** stem pipe that moves water under the driving range. **Fig.6.C** is provided as a reference for the cobble-sized substrate introduced to Joe's creek by the restoration project shown in Fig.6.A and B.

Survey Summary

The Wild Fish Conservancy survey documented the presence of juvenile *Oncorhynchus clarki* (cutthroat trout) and *Oncorhynchus kisutch* (coho salmon) in the survey reach of Joe's Creek. In coastal areas, cutthroat (like steelhead) have adopted multiple life history strategies including an adult-migrant strategy (anadromous) and a resident (non-anadromous) strategy. Both life histories of cutthroat appear to be present in the Joe's Creek ecosystem given our observation of smolting 150mm fish, a large sized redd, and putative stream resident fish greater than 200mm. Coho salmon were found only in a localized area which suggests that coho spawning during the previous season was limited to that area and included very few (possibly only two) coho spawners.

Though no rainbow trout or steelhead were observed in Joe's Creek, the stream clearly supports cutthroat trout and coho salmon – species that share many of the steelhead habitat requirements and are often found to coexist with steelhead. The absence of steelhead observations during one point-in-time survey does not mean that steelhead could not or do not use Joe's Creek for spawning and rearing, or that Joe's Creek is unsuitable habitat for steelhead. Variable flows and a flashy hydrograph are characteristics of other Western streams like Joe's Creek which can be used opportunistically by small spawning populations of steelhead.

Wild Fish Conservancy believes that steelhead could enter the stream during periods of greater flow (e.g. following a rain event), hold temporarily in deep pools, spawn, and exit the system. In the event that adult steelhead did enter the system successfully and spawn, WFC believes that rainbow/steelhead juveniles could rear productively in the stream.

Please feel free to contact me with any questions about Wild Fish Conservancy's survey or this report.

Sincerely,

Jamie Glasgow
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Wild Fish Conservancy