

2018-2019 Wild Skagit Steelhead Management Season Post-Season Report

Washington Department of Fish and Wildlife

Swinomish Indian Tribe

Upper Skagit Indian Tribe

Sauk-Suiattle Indian Tribe

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Introduction

This document describes fishery management actions, harvest activity, escapement and abundance assessment for the 2018-2019 wild Skagit steelhead management season, in accordance with the requirements of the Skagit River Steelhead Fishery Resource Management Plan. The wild Skagit steelhead management season runs from July 1st to June 30th of the following year. Thus, this report covers wild steelhead harvest during the July 1st, 2018 to June 30th, 2019 time frame.

Harvest Objectives

The Skagit River Steelhead Fishery Resource Management Plan defines a tiered harvest regime, in which the total allowable wild harvest rate depends upon total forecast wild terminal abundance (Table 1). The pre-season forecast for 2018-2019 Skagit wild steelhead abundance was 6,567 so fisheries were planned such that the total harvest rate would not exceed 20%.

Table 1. Stepped fishing regime used for managing wild steelhead fisheries in the Skagit SMU (Sauk-Suiattle Indian Tribe et al. 2016).

Preseason Forecast for Natural-Origin Steelhead	Allowable Impact Rate
Terminal Run \leq 4,000	4%
4,001 \leq Terminal Run $<$ 6,000	10%
6,001 \leq Terminal Run $<$ 8,000	20%
Terminal Run \geq 8,001	25%

Note that for pre-season planning and post-season assessment, an adjustment is applied to kelts such that they count less in harvest totals and harvest rates than pre-spawn steelhead. The kelt adjustment factor was calculated as the average percentage of returning fish each year over the last 10 return years (2009-2018) that had already spawned in at least one previous year, based on scale sample analysis. The kelt adjustment factor calculated in this manner for the 2018-2019 wild steelhead management season was 8.68%. That is, a harvested kelt counts as 8.68% of a pre-spawn steelhead. For tribal net fisheries an additional 2% mortality is applied for net drop-out, those fish which escape from the net prior to landing.

Tribal Fisheries

Tribal commercial terminal area fisheries targeting wild Skagit steelhead were conducted from February through April, 2019, as the pre-season forecast was sufficient to support a commercial opening. As expected, wild Skagit steelhead were also caught incidentally in terminal area tribal spring Chinook and sockeye commercial fisheries that occurred during the July 1, 2018 through June 30, 2019 wild steelhead management season timeframe.

A total of 141 wild pre-spawn, 175 wild kelt, and 13 hatchery steelhead were caught and retained in these fisheries based on catch sampling and fish tickets. None were released. Using a kelt adjustment factor of 8.68%, the total kelt-adjusted wild mortality was 157 steelhead (rounded), including the unadjusted pre-spawn fish. The total kelt-adjusted wild mortality, including 2% net drop out mortality, is 160 steelhead. Totals may not sum exactly due to rounding of individual components.

Test Fisheries

Steelhead were caught during directed steelhead, Chinook, sockeye, and coho test fisheries, conducted by the Skagit River System Cooperative and the Upper Skagit Indian Tribe, that occurred in the Skagit River during the July 1st, 2018 to June 30th, 2019 wild steelhead management season. The directed steelhead test fishery conducted by the Upper Skagit Indian Tribe is a tangle-net fishery in which all wild steelhead are released after sampling and PIT tagging. There is an assumed 18.5% release mortality rate applied to steelhead released from this fishery¹.

A total of 158 wild pre-spawn, 17 wild kelt, and 2 hatchery steelhead were encountered in these fisheries. Of the wild encounters, 149 wild prespawn and 14 wild kelt steelhead were released. This gives estimated total of 37 wild prespawn and 6 wild kelt mortalities including the retained fish and estimated release mortalities. Using the kelt adjustment factor described above, the total kelt-adjusted wild mortality associated with these fisheries was 37 steelhead. The total kelt-adjusted wild mortality including an additional 2% net drop out mortality is 38 steelhead. Totals may not sum exactly due to rounding of individual components.

Sport Fisheries

In 2019, a directed steelhead catch and release sport fishery was open from February 1st through April 30th. The fishery occurred on the Skagit River from the Dalles Bridge in Concrete (RM 54.1) to the Cascade River Road bridge in Marblemount (RM 78.3), and on the Sauk River from the mouth to the Sauk Prairie Road Bridge (RM 20.1). Fishing hours were limited to daylight hours only, which are described as from one hour before sunrise to one hour after sunset. Gear was restricted to artificial lures or flies only, no bait or scent, with single barbless hooks allowed (selective gear rules). Fishing from boats was allowed, but not while under power.

Based on a creel survey conducted during this fishery, anglers encountered and released 1,127 wild steelhead, retained 2 hatchery (adipose clipped) steelhead and released 3 hatchery steelhead. Assuming a 10% release mortality rate, the number of wild steelhead mortalities associated with this fishery was 113 (rounded). Evaluation of the creel methods used and calculation of the error with the catch estimates are in progress. During the 2019 creel 38.0% of total effort was accounted for by angler interviews. WDFW is committed to improvements in creel methods where improvements can be attained for future fisheries.

Steelhead were also encountered incidentally in the spring Chinook, sockeye, and general gamefish fisheries that were open during the July 1st, 2018 to June 30th, 2019 wild steelhead management season. No creel survey has been conducted during the upriver Skagit River spring Chinook sport fishery since 2012, so wild steelhead encounters during the 2019 fishery, which occurred from June 1-July 15th, were based on the average encounter rate during the 2010, 2011, and 2012 fisheries from which creel data is available. Based on this encounter rate, an estimated 65 wild steelhead were encountered incidentally and released during the 2019 fishery. Assuming 80% (52) of those were kelts and applying the 8.68% kelt adjustment to those, the total kelt adjusted encounters was 18 including the un-adjusted pre-spawn

¹ The 18.5% was based on co-manager consensus based on literature review and other information available at the time of the tangle-net test fishery inception; it has not been tested or validated for this fishery.

fish. Applying a 10% release mortality rate to the total kelt-adjusted encounters gives an estimate of 2 kelt-adjusted wild steelhead incidental mortalities for these fisheries.

Creel surveys were conducted during the 2018 (open 6/16-7/15) and 2019 (open 6/16-7/15) Skagit River sockeye sport fisheries and the 2019 lower Skagit River hatchery spring Chinook sport fishery (open 5/1 – 5/31). An estimated 5 wild steelhead were encountered incidentally and released from the July 1st to July 15th portion of the 2018 sockeye fishery and an estimated 5 hatchery steelhead were encountered incidentally and legally retained. During the June 16th to June 30th portion of the 2019 sockeye fishery, an estimated 6 wild steelhead were encountered incidentally and released and no hatchery steelhead were encountered. During the 2019 lower-river hatchery spring Chinook fishery, anglers encountered and released 21 wild steelhead (not identified as kelts), and legally retained 5 hatchery steelhead.

An estimated 12 wild steelhead release mortalities (120 encounters) were also estimated to occur during the basin-wide gamefish season that was open from June 1st to January 31st. Because no creel occurs during this fishery, the estimate was based on the average encounter rate (CRC catch/TRS) during years in which wild steelhead retention was most recently allowed (the 1992-1993 through 1999-2000 management seasons).

The total estimated wild steelhead mortalities over all sport fisheries was 129 kelt-adjusted wild steelhead.

Escapement

Skagit winter run steelhead spawn in the mainstem and tributaries of the Skagit River basin. Spawning ground surveys began February 21, 2019 in Skagit tributaries near the town of Sedro Woolley, and continued as late as June 13, 2019 in the Sauk River tributary indexes. Tributary stream indexes were surveyed by foot on a 7 to 14 day cycle. New redds were marked with survey flagging and enumerated. Linear regression of individual redds (counted per km² of available spawning habitat area within indexes) was applied to available spawning habitat area in unmonitored tributaries (per km²) to estimate the expected number of steelhead redds within unmonitored tributary spawning habitat.

Helicopter surveys were conducted over steelhead spawning grounds within the Skagit River mainstem from the Highway 9 Bridge in Sedro Woolley, to the mouth of the Sauk River and the Sauk River from the mouth upstream including the North Fork from mouth to falls and South Fork from mouth to RM 2.6. All visible redds were counted during aerial surveys regardless of any ability to identify whether they were new or previously constructed redds. Total mainstem redds in flown indexes were estimated using the area under the curve methodology. The remaining anadromous reaches of the Skagit River, from the Sauk River mouth to the Newhalem powerhouse, were surveyed by jet boat and individual redds were counted and locations recorded (GPS).

The Cascade River, White Chuck River, and Suiattle River have not historically been surveyed due to the poor viewing conditions, remoteness, potential hazards to surveyors, and numerous additional logistical obstacles. Spawning abundances in these systems were estimated using redds per mile calculated from specific mainstem sections of the Skagit River and Sauk River, multiplied by the length of the estimated mainstem anadromous zones of these rivers. The number of redds estimated in the 18.5 miles of steelhead spawning habitat in the mainstem of the Cascade River used the redds per mile estimate from Skagit River surveys between the Newhalem powerhouse and the town of Rockport. The number of redds built in the estimated 12.8 river miles of spawning habitat in the White Chuck River and estimated

26.3 miles of the Suiattle River mainstem used the redds per mile estimate from the mainstem Sauk River surveys from the Sauk River forks to the Darrington Sauk Prairie Road Bridge.

A total of 162 steelhead redds were observed in Skagit Basin tributary indexes in 2019 (Table 1). Linear regression predicted an additional 1,189 steelhead redds in the un-surveyed tributaries of the Skagit basin.

There were up to six mainstem flight surveys of the Skagit River and Sauk River indexes conducted over the course of the season, and jet boat sections of the mainstem were surveyed every 7 to 14 days. We estimated 479 mainstem winter steelhead redds in the aerial and jet boat surveyed sections. An additional 327 redds were estimated using redds per mile expansions for the mainstem areas of the Cascade, Suiattle, and White Chuck Rivers. A total of 2,157 Skagit winter steelhead redds were estimated in the basin in 2019 (Table 2). Assuming a 1:1 sex ratio, total redds were multiplied by two fish per redd and the 2019 Skagit River wild winter steelhead expected spawning abundance was 4,314 fish (rounded).

The Skagit co-managers are committed to making improvements to the current escapement methodology and are committing, on an annual basis, resources to that effect.

Table 2. 2019 Skagit winter run steelhead spawning abundance estimates.

Method		Redds		
<u>Total observed tributary redds (surveys)</u>				
Skagit tributary indexes	Census	113		
Sauk tributary indexes	Census	49		
<u>Total expected tributary redds from linear regression (non-surveyed)</u>				
Skagit	Regression	1,053		
Sauk	Regression	62		
Suiattle	Regression	63		
Cascade	Regression	11		
<u>Total calculated, cumulative observed redds</u>				
mainstem Lower Skagit	Flight surveys (AUC)	68		
mainstem Upper Skagit	Boat surveys	187		
mainstem Lower Sauk	Flight surveys (AUC)	128		
mainstem Upper Sauk	Flight surveys (AUC)	93		
SF Sauk	Flight surveys (AUC)	3		
<u>Total calculated redds (non-surveyed mainstems)</u>				
Cascade	Expansion using Upper Skagit redds/mile	133		
Suiattle	Expansion using Upper Sauk redds/mile	131		
White Chuck	Expansion using Upper Sauk redds/mile	64		
		Redds	Fish/redd	Fish
Skagit winter steelhead anadromous spawner abundance estimate:		2,157	2.0	4,314

Total Abundance and Harvest Rates

The total abundance (escapement plus catch) for the 2018-2019 wild steelhead management season (July 1st, 2018 to June 30th, 2019) was 4,636 wild Skagit steelhead, which was lower than the pre-season forecast of 6,567.

Total kelt-adjusted mortality was 326 Skagit wild steelhead over all tribal and non-tribal fisheries, including test fisheries, including net drop-out in net fisheries.

Based on the post-season abundance, kelt-adjusted wild steelhead harvest rates were 2.78% for sport fisheries, 3.38% for tribal commercial fisheries (3.44% with net drop-out), and 0.80% for test fisheries (0.82% with net drop-out). The overall kelt-adjusted wild steelhead harvest rate for all fisheries combined was 6.95% (7.04% with net drop-out). This is significantly lower than the maximum allowable harvest rate of 10% that would apply to the terminal run size tier of 4,001 – 6,000 (Table 1) based on the post-season abundance estimate.

References

Sauk-Suiattle Indian Tribe, S. I. T. Community, U. S. I. Tribe, S. R. S. Cooperative, and W. D. o. F. a. Wildlife. 2016. Skagit River Steelhead Fishery Resource Management Plan. November 18, 2016. 53.