2019-2020 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 2019-2020 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, 2019 to June 30th, 2020 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 2019-2020 Skagit wild steelhead abundance was 3,963 so fisheries were planned such that the total harvest rate would not exceed 4%.

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 ≤ 4,000	4%
4,001 ≤ Terminal Run <6,000	10%
6,001 ≤ Terminal Run <8,000	20%
Terminal Run ≥ 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 (2011-2020) 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 2019-2020 wild steelhead management season was 8.54%. That is, a harvested kelt counts as 8.54% of a pre-spawn steelhead. For tribal net fisheries, consistent with rates applied to Chinook net fisheries (PSIT and WDFW, 2010), an additional 2% mortality is applied for net drop-out, those fish which encounter the net and subsequently do not survive (via predation of escape), prior to landing.

Tribal Fisheries

Because of the low preseason forecast, no tribal commercial or C&S fisheries targeting steelhead were conducted in 2020. As expected, wild Skagit steelhead were caught incidentally in terminal area tribal spring Chinook and sockeye commercial fisheries that occurred during the 2019- 2020 wild steelhead management season timeframe.

An estimated total of 35.8 wild pre-spawn, 69.0 wild kelt, and 3.7 hatchery steelhead were caught and retained in these fisheries based on catch sampling and fish tickets. (Note that these are calculated values based on sampling data, so the decimal point is carried through the calculations until the end of this section.) None were released. Using a kelt adjustment factor of 8.54%, the total kelt-adjusted wild mortality was 41.7 steelhead, including the unadjusted pre-spawn fish. When adding the 2% net drop

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out mortality, the total kelt-adjusted wild mortality was 43 steelhead (rounded from 42.5). Totals may not sum exactly due to rounding of individual calculated 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 2019-2020 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 fishery[1].

A total of 86 wild pre-spawn, 2 wild kelt, and 1 hatchery steelhead were encountered in these fisheries. Of the wild encounters, 84 wild prespawn and 1 wild kelt steelhead were released. This gives an estimated total of 17.5 wild prespawn and 1.2 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 17.6 steelhead. The total kelt-adjusted wild mortality including an additional 2% net drop out mortality was 18 steelhead (rounded). Totals may not sum exactly due to rounding of individual calculated components.

Sport Fisheries

Because of the low preseason forecast, no State of Washington fisheries targeting steelhead were scheduled or conducted in 2020.

Steelhead were incidentally encountered in the spring Chinook, sockeye, and general gamefish fisheries that were open during the July 1st, 2019 to June 30th, 2020 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 2020 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 59 wild steelhead were encountered incidentally and released during the 2020 fishery. Assuming 80% (47.6) of those were kelts, and applying the 8.54% kelt adjustment to those, the total kelt adjusted encounters was 16.0 including the un-adjusted pre-spawn fish. Applying a 10% release mortality rate to the total kelt-adjusted encounters gives an estimate of 1.6 kelt-adjusted wild steelhead incidental mortalities for these fisheries.

Creel surveys were conducted during the 2019 Skagit River sport fishery for Baker sockeye (open 6/16-7/15), and the 2020 lower Skagit River hatchery spring Chinook sport fishery (open 5/16 – 5/31). An estimated 4.3 wild steelhead were encountered incidentally and released from the July 1st to July 15th portion of the 2019 sockeye fishery. Assuming 80% of those fish were kelts, 3.4 kelts and 0.9 prespawn wild fish were encountered during this portion of the sockeye fishery, which resulted in 0.1 kelt adjusted incidental steelhead mortalities. During the 2020 lower-river hatchery spring Chinook fishery, anglers encountered and released 10.3 pre-spawn and 4.5 kelt wild steelhead. Applying the kelt adjustment factor and 10% release mortality rate to the total encounters gives an estimate of 1.1 kelt-adjusted wild steelhead incidental mortalities for this fisheries ((10.3+(4.5*.0854))*.10).

[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.

An estimated 8.2 wild steelhead release mortalities (82 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 11 (1.6+0.1+1.1+8.2) kelt-adjusted wild steelhead (rounded).

Escapement

Skagit winter run steelhead spawn in the mainstem and tributaries of the Skagit River basin. Spawning ground surveys began February 25, 2020 in Skagit tributaries near the town of Sedro Woolley, and continued as late as June 17, 2020 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 km^2 of available spawning habitat area within indexes) was applied to available spawning habitat area in unmonitored tributaries (per km^2) 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 105 steelhead redds were observed in Skagit Basin tributary indexes in 2020 (Table 1). Linear regression predicted an additional 883 steelhead redds in the un-surveyed tributaries of the Skagit basin.

There were four 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 357 mainstem winter steelhead redds in the aerial and jet boat surveyed sections. An additional 165 redds were estimated using redds per mile expansions for the mainstem areas of the Cascade, Suiattle, and White Chuck Rivers. A total of 1,510 Skagit winter steelhead redds were

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estimated in the basin in 2020 (Table 2). Assuming a 1:1 sex ratio, total redds were multiplied by two fish per redd and the 2020 Skagit River wild winter steelhead expected spawning abundance was 3,020 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. 2020 Skagit winter run steelhead spawning abundance estimates.

	Method	Redds		
Total observed tributary redds (surveys)				
Skagit tributary indexes	Census	75		
Sauk tributary indexes	Census	30		
Total expected tributary redds from linear regression (non-surveyed)				
Skagit	Regression	811		
Sauk	Regression	34		
Suiattle	Regression	37		
Cascade	Regression	1		
Total calculated, cumulative observed redds				
mainstem Lower Skagit	Flight surveys (AUC)	75		
mainstem Upper Skagit	Boat surveys	133		
mainstem Lower Sauk	Flight surveys (AUC)	109		
mainstem Upper Sauk	Flight surveys (AUC)	34		
SF Sauk	Flight surveys (AUC)	5		
Total calculated redds (non-surveyed mainstems)				
Cascade	Expansion using Upper Skagit redds/mile	94		
Suiattle	Expansion using Upper Sauk redds/mile	48		
White Chuck	Expansion using Upper Sauk redds/mile	23		
		Redds	*Fish/redd*	*Fish*
Skagit winter steelhead anadromous spawner abundance estimate:		1,510	2.0	3,020

Total Abundance and Harvest Rates

The total abundance (escapement plus catch) for the 2019-2020 wild steelhead management season (July 1st, 2019 to June 30th, 2020) was 3,092 wild Skagit steelhead, which was lower than the pre-season forecast of 3,963.

Total kelt-adjusted mortality was 72 (rounded) 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 0.36% for sport fisheries, 1.39% for tribal commercial/C&S fisheries (including net drop-out), and 0.58% for test fisheries (including net drop-out). The overall kelt-adjusted wild steelhead harvest rate for all fisheries combined

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was 2.32% with net drop-out. This is significantly lower than the maximum allowable harvest rate of 4% that would apply to the lowest terminal run size tier of 0 - 4,000 (Table 1) based on the post-season abundance estimate.

Fishery	Mortality (Kelt-Adjusted)	Harvest Rate
Tribal Commercial/C&S	43	1.39%
Test Fishery	18	0.58%
Sport	11	0.36%
Total	**72**	**2.32%**

References

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