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South Coast Salmon Bulletin
6 August, 2025 Adult Enumeration #4
Sakinaw Lake Sockeye – Strait of Georgia Stock Assessment

Overview

The Sakinaw Sockeye population was designated as Endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in 2002 and again most recently in 2016. This Sockeye population is a Conservation Unit under the Wild Salmon Policy. This designation has resulted in a recovery strategy lead by Fisheries and Oceans Canada (DFO); which includes a captive breeding program with fry released into the lake each year. DFO has also published a Recovery Potential Assessment for Sakinaw Sockeye in 2017. The shíshálh (Sechelt) people have a long history with this unique Sockeye stock, which are the first salmon to return to this region each year. The adult returns historically provided an important food source for the shíshálh people.

Adult Sockeye return from the open ocean and migrate primarily through Johnstone Strait before entering the lake from June to September each year. The shíshálh First Nation have been very appreciative of the support given by First Nations communities delaying their harvest of food, social and ceremonial fisheries until the last week of July in Johnstone Strait. This delay has allowed substantial progress in the recovery of this Sockeye population. **In 2025, the expected return to Sakinaw Lake is estimated to be 379 adults** (see Table 1 below for recent returns) using marine survival data from recent returns.

Based on run timing data and incidental catch data of Sakinaw Sockeye, migration through Johnstone Strait to the lake takes about 8 days and most of the run has entered the lake by mid-August. Most adult Sockeye return as 4 year olds with some as age 3 or 5. The adults hold in the lake until they are ready to spawn in November and December. The fry from natural spawners emerge from the gravel at the spawning beaches in the spring each year. Fry releases from the captive breeding program are released into the mid-basin of Sakinaw Lake between May and July each year at 0.5 years old, with an additional fall release since 2019. Fry remain in the lake for one year until they smolt and migrate to the ocean (at age 1.5 or older) from April to June. Recently, hatchery smolts have been released in the spring of 2019 to 2025, of which a portion were PIT tagged to monitor outmigration success and survival. Additional juvenile release strategies are being explored, including a smolt release directly from Big Qualicum hatchery (each year since 2021), as well as a smolt transport program from the smolt trap to several kilometers offshore (piloted spring 2022 and conducted spring 2023 to 2025). A portion of Fall Fry were also PIT tagged in 2022 to 2024 which were observed leaving the lake as smolts in 2023 to 2025. The enumeration of smolts migrating to the ocean and adults returning to the lake are important metrics used to evaluate the success of the recovery strategy.

In 2019, DFO and shíshálh First Nation also began additional stock assessment on coho enumeration to develop a wild indicator for the Sunshine Coast. Activities include adult counts during the entire fall migration period as well as creek inspections to determine the distribution of spawners. Since the spring of 2020, a portion of the smolt migrants have been PIT tagged to estimate survival to return. These data will allow a more complete assessment of the heath and productivity of the watershed, as well as a better understanding of the coho stocks in the area.

This bulletin provides weekly updates on annual Sakinaw Lake Sockeye and Coho assessment activities involving DFO and the shíshálh First Nation. In the spring, this bulletin focuses on smolt emigrations of both species and through the summer the bulletin highlights sockeye adult returns (see our fall escapement bulletin for adult coho returns).

Adult Enumeration Methods

Sockeye adults are enumerated as they migrate from marine waters to the lake from late June to September each year. Sockeye tend to move into the lake during night-time high tides. Access to the lake is through an unobstructed fishway, where a video camera records their upstream migration. The video clips are reviewed and counts of Sockeye are added to the cumulative total escapement. Two PIT tag antennas have also been installed to record returning adults that were tagged as smolts. This will be particularly useful for evaluation of the smolt transport program over the next several years.

Marine migration data on Sakinaw Lake Sockeye is limited. Current data suggests Sakinaw Lake Sockeye have a prolonged migration period commencing in Johnstone Strait in late May to July and arriving at the entrance to Sakinaw

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Lake in upper Strait of Georgia in July to September. Given this timing pattern, Sakinaw Lake Sockeye are most vulnerable to harvest directed at Fraser River Sockeye stocks in July extending into mid-August.

Average run timing, for years where adequate data are available (from 2002-2024), suggest that 50% of the run are in the lake by 29 July each year (varying from 19 July to 9 August), and on average 80% are in the lake by 8 August (varying from 27 July to 20 August). Fraser River Sockeye fisheries openings are limited to later timing when the majority of Sakinaw Sockeye have entered the lake. Information from Sakinaw Sockeye adult enumeration and test fishing results are used to make decisions on fishery openings.

2025 Adult Expectations

In 2023, the estimated number of smolts that emigrated from Sakinaw lake was 138,480. The average smolt to adult survival observed from recent adult returns is approximately 0.149% for hatchery smolts and 0.300% for wild smolts and not-clipped smolts (includes spring fry releases that were not clipped in recent years). Assuming average survival from recent years, **we expect approximately 379 adults (35 clipped from clipped fry and smolt releases and 344 not-clipped from not-clipped fry releases or natural production) to return in 2025**.

The hatchery raised fish from 2021 brood year, which were released as fry in 2022 (spring fry not clipped and fall fry clipped) and migrated to the ocean as smolts in spring 2023, were only 8.84% marked with an adipose fin clip. Therefore, the majority of not clipped adults returning this year will likely be from hatchery production. Only 26 adults returned in 2021, so it is likely only 10% of the 114,881 estimated not clipped smolts that left the lake in 2023 were from natural production, therefore only approximately 3 of the 344 not clipped adults forecasted could be naturally produced adults.

2025 Adult Enumeration

The adult fishway and video system were installed on 27 June and enumeration began immediately. Video is reviewed at least twice per week to check for new migrants which appear as motion events in the recordings. The first adult sockeye returned on the evening of 15 July, and was a large clipped male. One PIT tagged fish was detected on 19 July and was a Medium smolt released in the spring of 2023, and a second PIT tag was detected on 28 July which was a transport smolt from 2023. The crew has been monitoring the site from late evening into the early morning hours to deter predators. Due to low water levels, migration up into the fishway is difficult unless it is a high tide. A total of 2 Sakinaw Sockeye have been sampled in the Area 12 gillnet test fishery and 3 in the Area 12 purse seine test fishery up to 1 August.

Cumulative totals for 2025 Sockeye migration, up to the end of 5 August are:

Sex	Clipped	Not-Clipped	Unknown	Total
Female	18	74	0	**92**
Male	17	68	0	**85**
Unknown	0	0	0	**0**
Total	**35**	**142**	**0**	**177**

Additionally, a total of 27 clipped sockeye have returned to Big Qualicum hatchery as of 5 August from the smolt releases in the Big Qualicum River. These fish have been transferred to Rosewall Hatchery and DNA results will confirm if returns to Big Qualicum are Sakinaw sockeye, in which case they will be used for broodstock.

Contacts

For additional information on the enumeration of Sakinaw Lake Sockeye please contact:

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Sakinaw Sockeye Data

Table 1. The numbers of adult sockeye salmon that returned to Sakinaw Lake each brood year (BY), including those removed as male and female broodstock. The estimated number of adults that spawned naturally in the lake is the difference between the return and the hatchery removal, minus any natural mortality before spawning. The numbers of fry (in thousands) released into the lake in the following year (BY+1) separated by 1st year brood releases and captive brood releases, and the numbers of natural and hatchery smolts (in thousands) emigrating from the lake after two years (BY+2) are also shown. Zeros indicate no fish; dashes indicate no data. ***Unk*** indicates an unknown number of natural smolts were included in the hatchery smolt total because there was no adipose clipping of hatchery juveniles from that year. Numbers in parentheses indicate Sakinaw sockeye parents from which fertilized eggs were used to found the captive breeding program at Rosewall hatchery.

Adult Escapement (BY)					Fry (BY+1) + Smolt (BY+2) Releases (000's)			Smolt Migrants (BY+2) (000's)		
Brood Year	Returns		Hatchery Removal		Wild Brood Releases	Captive Brood Releases	Total	Natural	Hatchery	Total
	Adult	Jack	Female	Male						
2000	122		10	9	15	0	15	-	-	-
2001	87		15	14	31.9	0	31.9	4.3	8.1	12.4
2002	78		6(5)	10(9)	2.8	0	2.8	0.103	0.039	0.142
2003	3		0	0	0	0	0	0.011	0.002	0.013
2004	99		31(28)	31(28)	25.9	0	25.9	2.9	8.4	11.3
2005	28		6(6)	8(8)	7.6	87.9	95.5	0.272	3.7	4.0
2006	1		0	0	0	84.6	84.6	0	12.2	12.2
2007	0		0	0	0	420.8	420.8	0	62.6	62.6
2008	0		0	0	0	726.4	726.4	0	69.9	69.9
2009	1		0	0	0	329.4	329.4	0	32.9	32.9
2010	29		4	9	5.1	1368.7	1373.8	unk	162.9	162.9
2011	554		0	0	0	972.2	972.2	28.0	224.6	252.5
2012	244		0	0	0	856.2	856.2	4.4	121.6	126.0
2013	114	29	0	0	0	320.4	320.4	0.632	16.5	17.1
2014	452	12	0	0	0	653.8	653.8	0.722	78.2	78.9
2015	695	26	0	0	0	329.1	329.1	4.8	30.0	34.8
2016	171	1	0	0	0	256.6	256.6	11.9	33.4	45.3
2017	12		0	0	0	536.6 + 25.7	562.2	1.1	83.9	85.0
2018	3		0	0	0	773.5 + 23.5	797.0	unk	209.0	209.0
2019	13		0	0	0	632.7+21.4	654.1	unk	169.2	169.2
2020	85		0	0	0	583.9+23.4	607.3	2.3	65.7	68.0
2021	26		0	0	0	777.6+24.2	801.7	unk	138.5	138.5
2022	213		0	0	0	311.4+24.3	335.8	7.3	106.2	113.5
2023	121		0	0	0	297.5+29.4	326.9		*Under	review
2024	183		0	0	0					

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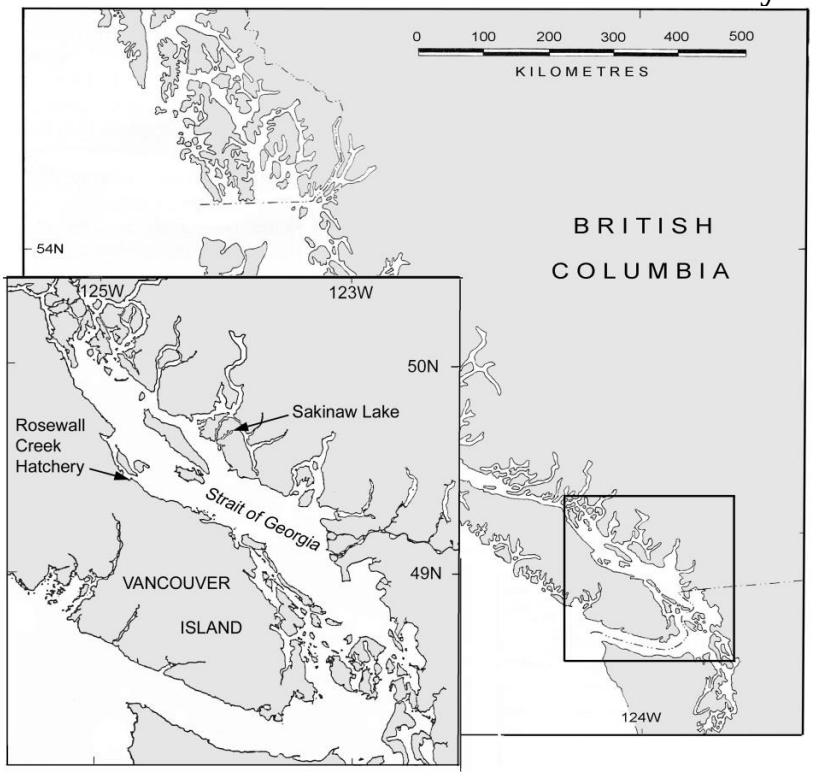

Figure 1: Location of Sakinaw Lake, on the Sunshine Coast of British Columbia, Canada.

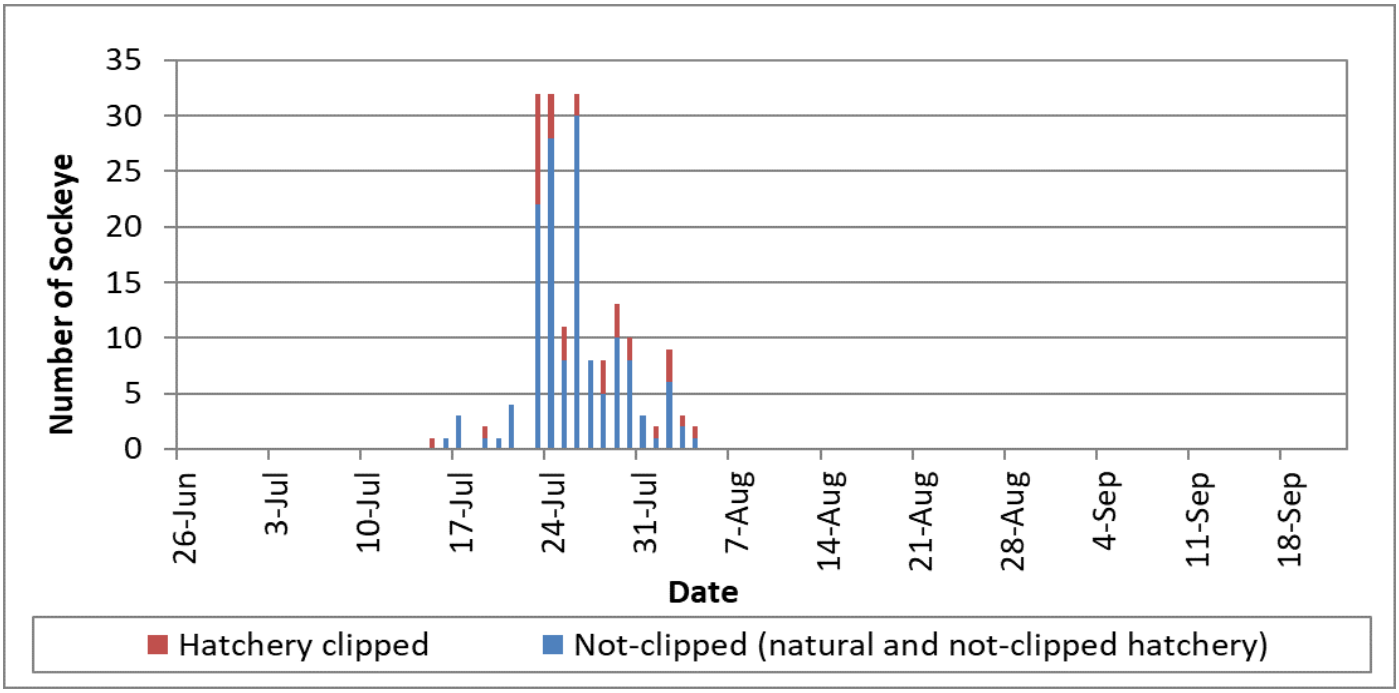

Figure 2: Daily Sockeye counts 2025, separated by clip status (hatchery clipped and natural and hatchery not-clipped).

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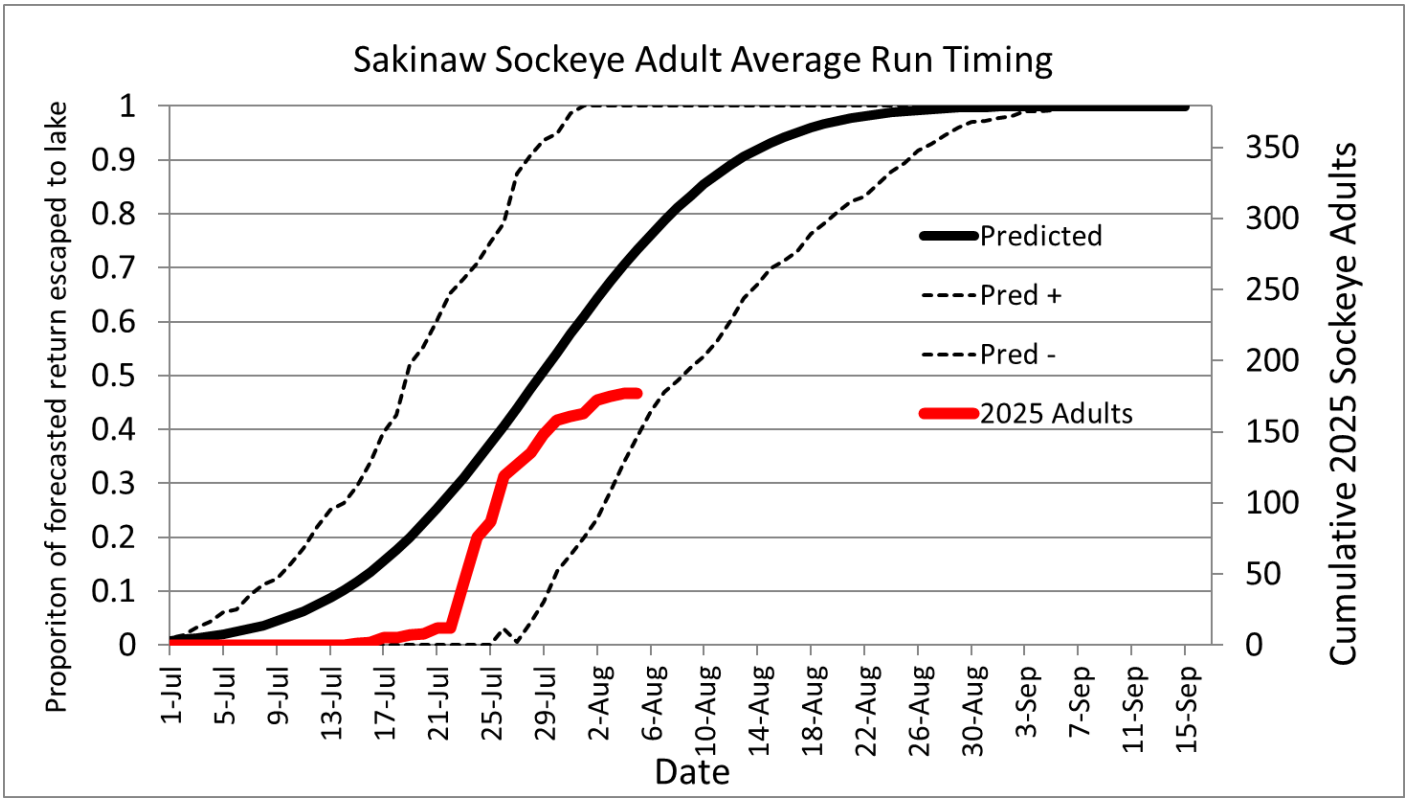

Figure 3: The solid black line indicates the Sakinaw Sockeye normalized run timing by date (natural and hatchery sockeye returns combined). The hashed black lines show the 95% confidence interval for each date. Solid red line shows the current 2025 total sockeye migration by date (right axis). The right axis is scaled to the forecasted 379 sockeye (combined 35 clipped and 344 not-clipped) for 2025 Expectations.