



South Coast Salmon

Strait of Georgia Stock Assessment

Final 2020 Escapement Bulletin– Area 18 Cowichan River

Updated September 2021

Summary

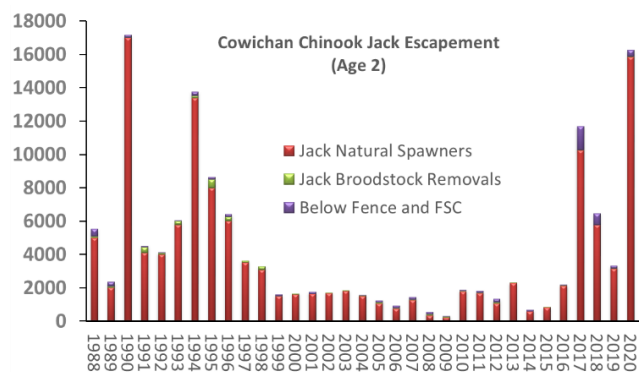
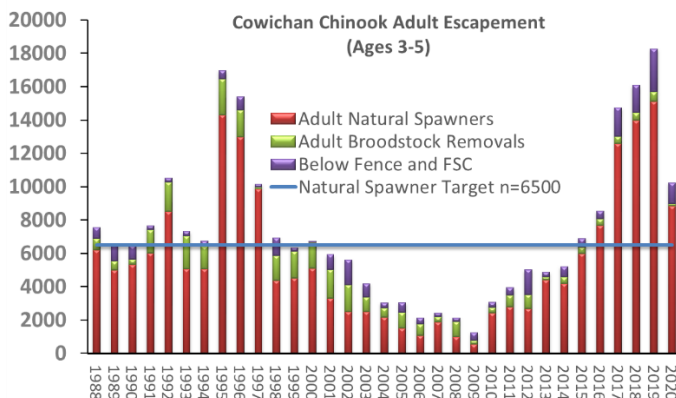
This bulletin summarizes salmon stock assessment and research activities conducted in the Cowichan River watershed by a variety of organizations including Cowichan Tribes, DFO, contractors and academic institutions.

Final 2020 Escapement Summary

The fence in the 2020 season ran from 16:00 on September 10th to 14:00 on October 9th. A total of **10,018 Chinook (5,604 adults and 4,414 jacks)** were recorded through the fence. **18 adult PIT tags** and **16 jack PIT tags** were detected while the fence was operational, resulting in a mark rate of 1 in 311 adults and 1 in 276 jacks. Using PIT tag detections we can estimate that 62.1% of adults and 26.7% of jacks passed through the fence between September 10th and October 9th. PIT tag detections following fence removal (29 adults and 60 jacks) were used to expand the number of Chinook that passed during the remainder of the run. Expansions indicate a total escapement of **26,506 Chinook (10,241 adults, 16,265 jacks) including 24,690 natural spawners (8,849 adults, 15,841 jacks)**. Hatchery contribution to the natural spawning population was estimated at 12.8% for jacks and 19.6% for adults based on adipose clips.

In addition, a total of **3,338 Coho (3,112 adults, 226 Jacks)** were recorded through the fence in 2020 along with **84 Chum** and **59 Pink**.

Counts from the second full season operation of the Skutz Falls fishway camera were **3,422 Chinook (2,096 adults, 1,325 jacks), 7,035 Coho (6,371 adults and 664 jacks) and 10,352 Chum**. The camera was operational from August 16th to November 16th.



2020 Operations

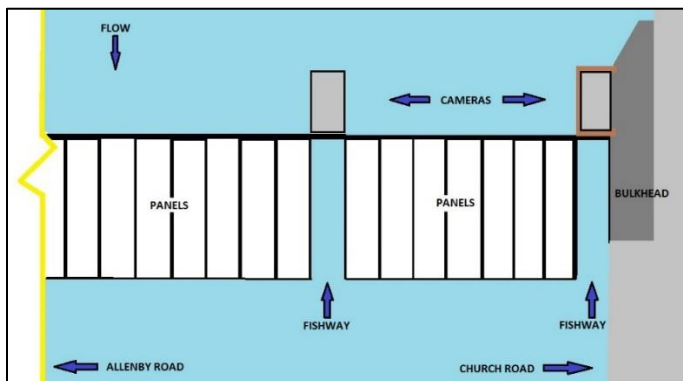
Key infrastructure upgrades at the enumeration fence in 2020 included new Passive Integrated Transponder (PIT) in-river arrays. Utilization of two passageways at the fence also continued for 2020. The two passageways, one located against the bulkhead and one mid-river, have replaced traditional camera boxes to improve fish migration. Results from 2018 and 2019 indicate that fish strongly prefer the wider passages compared to the traditional camera tunnels. Delays below the fence have been reduced with the highest single day migration totals observed in 2019 for the 32 year program. Each passageway is instrumented with two under water cameras with motion detection capability as well as LED lights for night time operation.



Escapement Monitoring Methods

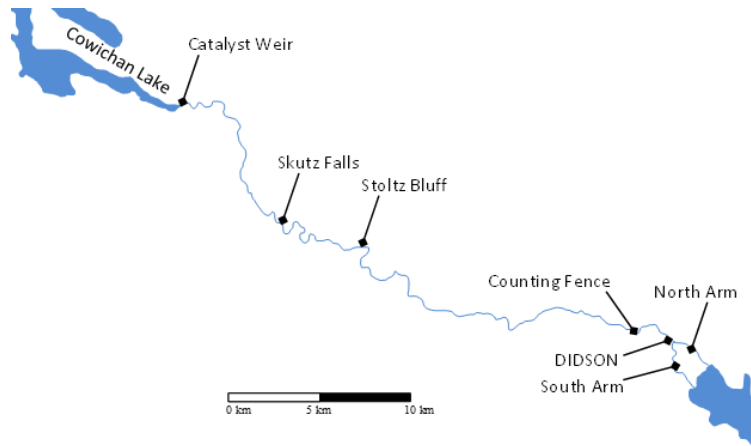
Counting Fence

The counting fence is located 150 m downstream of the Allenby Road bridge crossing and is accessed via Church Road on Cowichan Tribes land. The fence funnels migrating fish through two passages where species, size and origin can be evaluated. The camera is set to record each migration event based on a motion trigger such that data can be reviewed. Crews are present at the fence 24 hours per day to enumerate fish as they move past the cameras as well as to clear debris and maintain equipment as required. The floating panels pivot based on water levels and are expected to remain operational through mid-October. The fence is not designed to withstand high flows and will be removed when the discharge exceeds 30 m³/s.

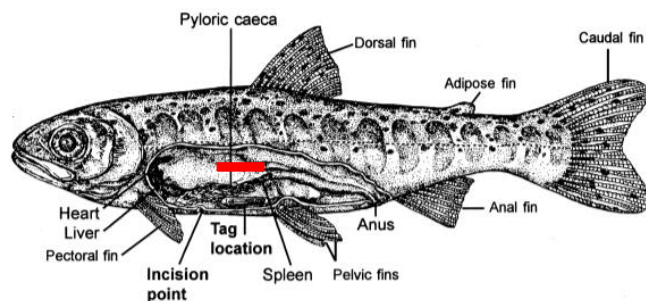


PIT Tags

Returning chinook will also continue to be scanned for PIT tags using the in-river arrays at the counting fence and Skutz Falls, as well as during brood stock collection. Temporary arrays have also been installed in the south and north arm channels in order to better understand lower river migration behavior. Over 65,000 juveniles have been implanted with tags since 2014 with funding from the Pacific Salmon Foundation as part of the Salish Sea Marine Survival Project and more recently the Pacific Salmon Commission. Tag detections will provide information on survival rates for groups tagged in the river, Cowichan Bay and the Gulf Islands throughout their first year of life.



The tags operate on Radio Frequency Identification (RFID) technology and do not have a battery. They can be read at short distances (50-150 cm) with an antenna that both charges the tag with a magnetic field and listens for the response. Tag detections are linked to a tagging data base which provides information on the time, location, origin and size of each fish on the day it was tagged. The proportion of tags in the population passing through the fence and/or in brood sets can be used to expand the number of detections on the permanent arrays to a total run size. This can particularly useful in years when the operation of the fence does not cover the entire run time (installed late or removed due to high water).

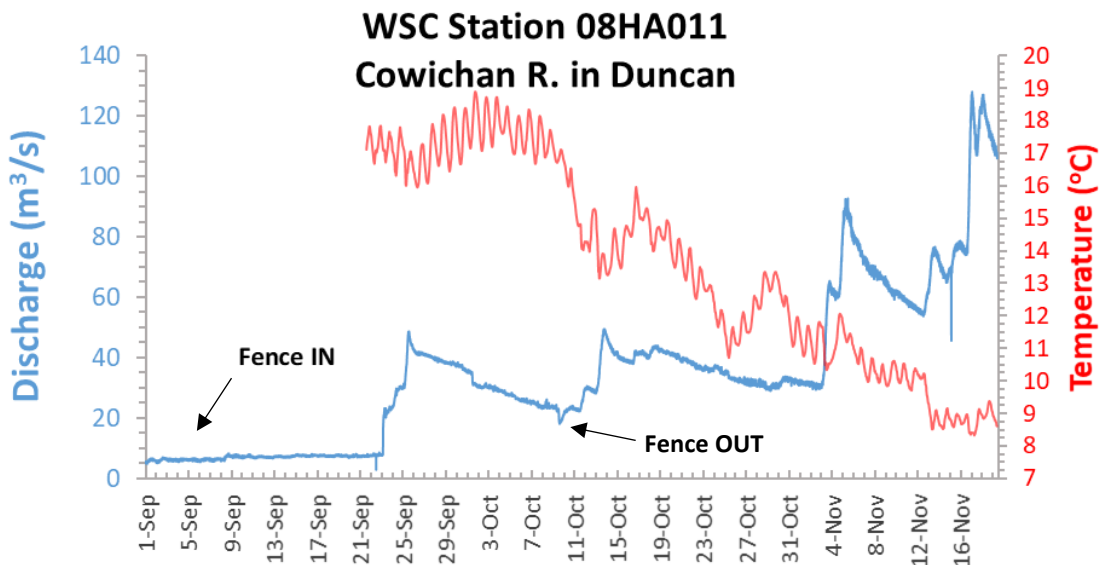


DIDSON

Dual-frequency Identification Sonar (DIDSON) technology uses high frequency sound waves to visualize and count fish in a wide range of stream conditions. DIDSONs are especially useful when water is turbid and traditional video cameras would not be able to capture a clear image. The images produced can tell us the size of fish, how many pass through and which direction they are going. This information, combined with species composition information, helps us count how many fish are moving upstream to spawn.

Environmental Conditions

In anticipation of significant rainfall, the counting fence was removed on the afternoon of October 9th following the initial install on September 10th. Rainfall occurred as forecast between October 10th and October 12th, leading to increased flow and decreased temperature in the river. The weir at the outlet of Cowichan Lake was decommissioned for the season the week of October 21st. Discharge and temperature information for the Cowichan River in Duncan can be found below.



2020 Adult Enumeration

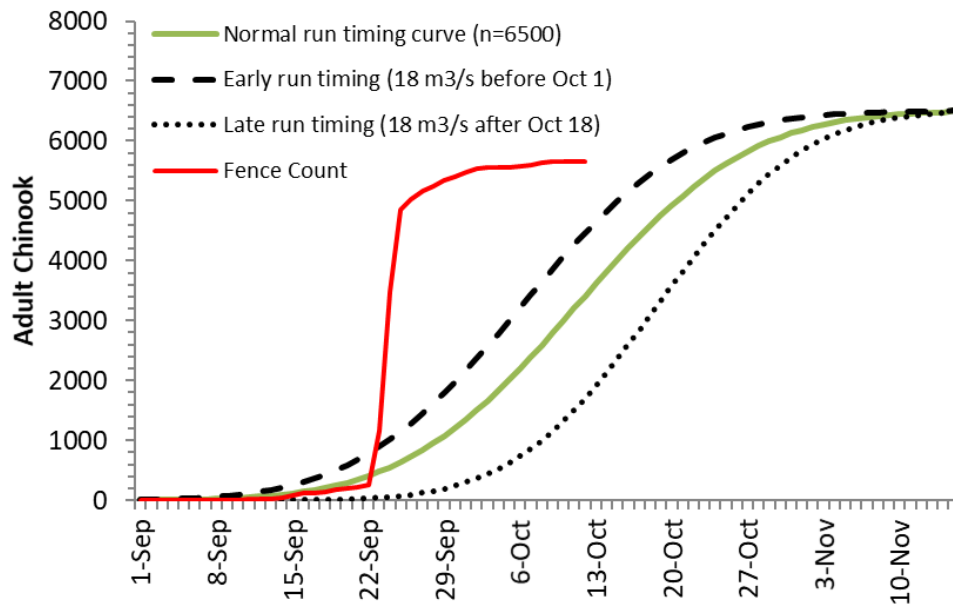
Counting Fence

Chinook enumeration at the counting fence began on September 10th and ended on October 9th due to heavy rain and rising flows.

Chinook: Cumulative totals for 2020 Chinook migration at the fence, up to October 9th at 4:00 PM are:

	Wild	Hatchery	Total
Adults	5311	294	5604
Jacks	4037	376	4414
Total	9348	670	10018

The graph below compares the in-season counts for 2020 Chinook Adults to the run timing curve based on river conditions.



Coho, Chum and Pink: Cumulative totals for 2020 migration at the fence, up to October 9th at 4:00 PM are:

	Coho	Chum	Pink
Adults	3112	84	59
Jacks	226		
Total	3338	84	59

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Correct citation: Fisheries and Oceans Canada. 2024. South Coast Assessment Bulletin, final 2020 Escapement Bulletin–Area 18 Cowichan River: 6 p