



The Trials and Tribulations of BCCF

A high level summary of some BCCF lead projects on
The Cowichan River

PRESENTATION FOR COWICHAN WATERSHED BOARD

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Cowichan Steelhead Kelt PSAT Tagging

The Study

Attach Pop-up Satellite Archival Tags to 10 Cowichan Kelted steelhead and track for up to 120 days. **Temp, location, depth and acceleration**

Look at mortality rates of Kelts to understand fate of adult salmonids in Salish sea and beyond,

Get an idea of Kelt migration patterns

Try to qualify pinniped /other predation events through temperature (ingested tag)

2021

10 PSAT + Acoustic tags released in Satellite Channel

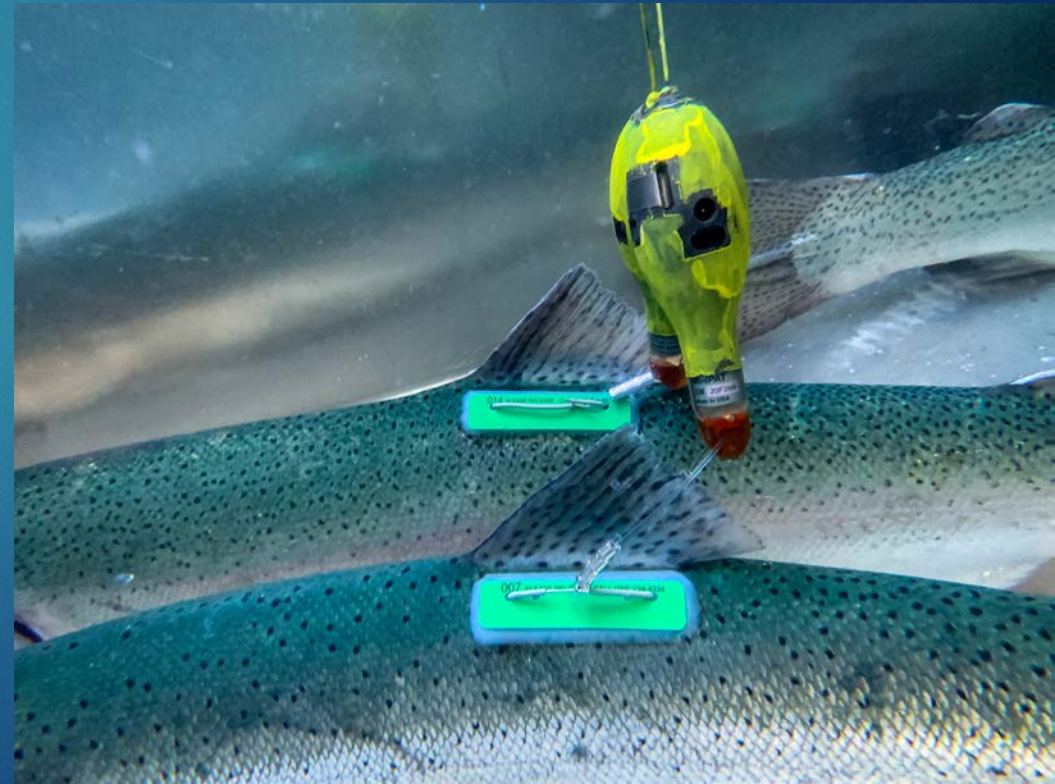
3 Acoustic only released in Lower Cowichan River

- 6 fish perished within 8 days of release (max 69 days)
- One fish made it far of WC – suspected salmon shark predator event.
- Other fates mostly unknown, but some can be correlated spatially to seal haulout locations

2022

8 PSAT tagged Kelts released in Southern Gulf Islands (off Swartz Bay)

Data incoming, 2 early mortalities off Victoria,





HCTF/PSF Cowichan Steelhead Population Dynamics

Study

Pit Tag Juvenile Cowichan Steel during outmigration

- Estimate at sea ocean survivals to adult return
- Get a mark recap estimate for adults by recapturing adults in Skutz Fishway (camera and PIT array)
- Estimate kelting rates, migration timing,

Results to Date

- Since 2017 Up to 90 adults captured and tagged each year
- Up to ~450 Smolts Tagged each year
- 1st year of expected adult returns this coming winter.
- Very difficult to get consistent number of tags out on smolts.
- Maternal origin confides fry and parr tagging



PSC Chinook Enumeration Methodology Change (with DFO)

The Study

To Use PIT tagged adult CN to estimate total population abundance. Using tagged rate obtained from fence camera

PIT infrastructure can be operated at flows much higher than conventional fence and can be used to estimate returns after fence is removed.

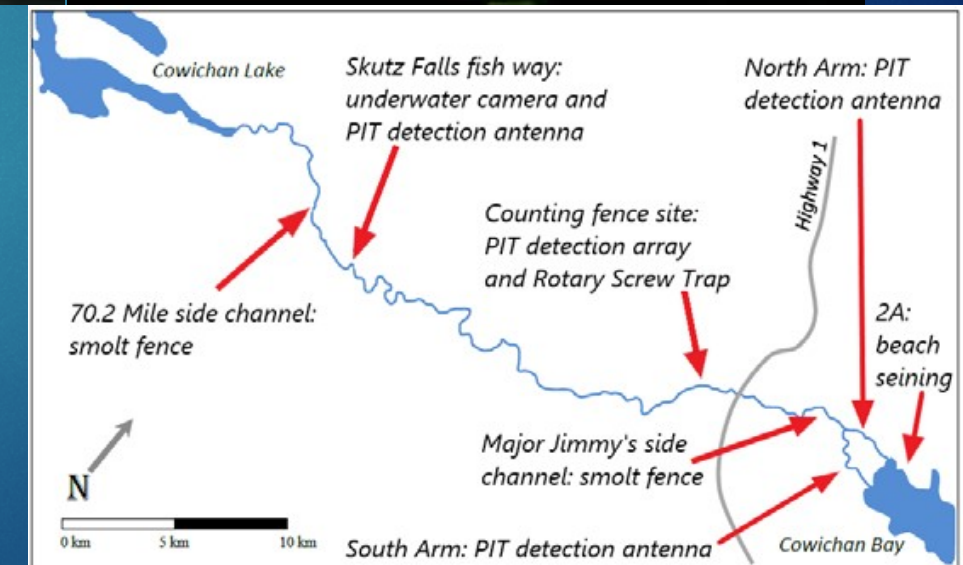
Fish may be tagged as juveniles or adults



PSC Cowichan Population Dynamics

The Study

- Since 2018 - develop a method using Passive Integrated Transponder (PIT) tags for enumeration of Cowichan River Coho Salmon while also estimating survival and run timing
- PIT Tag up to 5000 Coho smolts annually
- Started using SC traps but focus recently had been on tagging at mainstem RST
- DFO had upgraded infrastructure at Skutz fishway recently to provide reliable mark rates and estimates



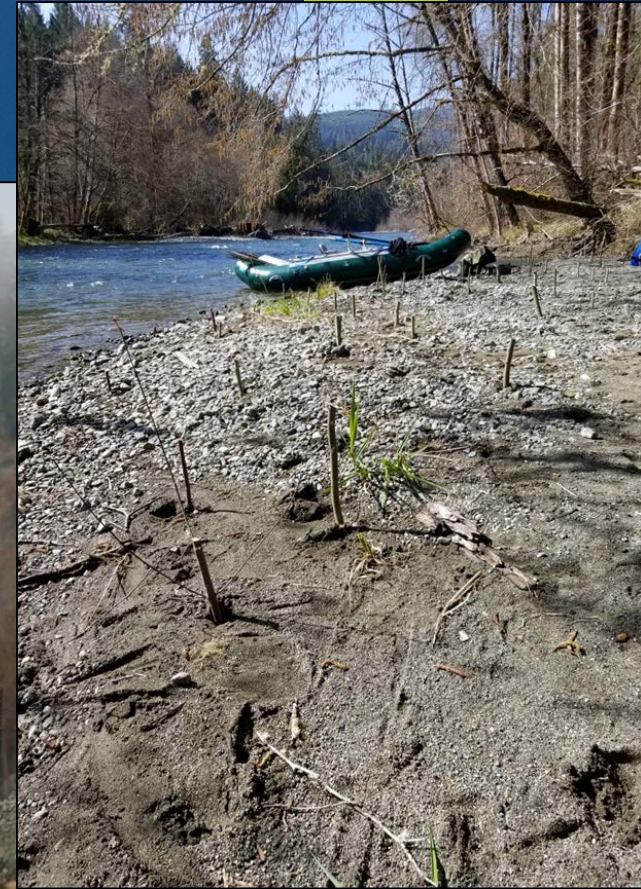
Cowichan Riparian Planting Initiative (CRF)

Goals

Restore ~ **3500 m² Per yr.** of riparian habitat with native plantings (black cottonwood, willow spp., and red-osier dogwood)

Provide riparian stability and instream habitat for juvenile salmonids

Also included some Cowichan Lake Shoreline restoration. Rehabilitating anthropogenic impacts resulting in lack of habitat and/or excess shoreline erosion.



CRF - Stoltz Bluff Maintenance and Monitoring

Goals

Keep the 2006 Stoltz Bluff remediation project functioning as intended.

Monitor site for significant changes or problems annually

Maintain site with heavy equipment as necessary

Carry out bioengineering /planting to encourage stability

Monitor sediment inputs from site using in-situ turbidity loggers



Is the newly found tire toxicant 6-PPD Quinone a risk for Vancouver Island salmonid populations?

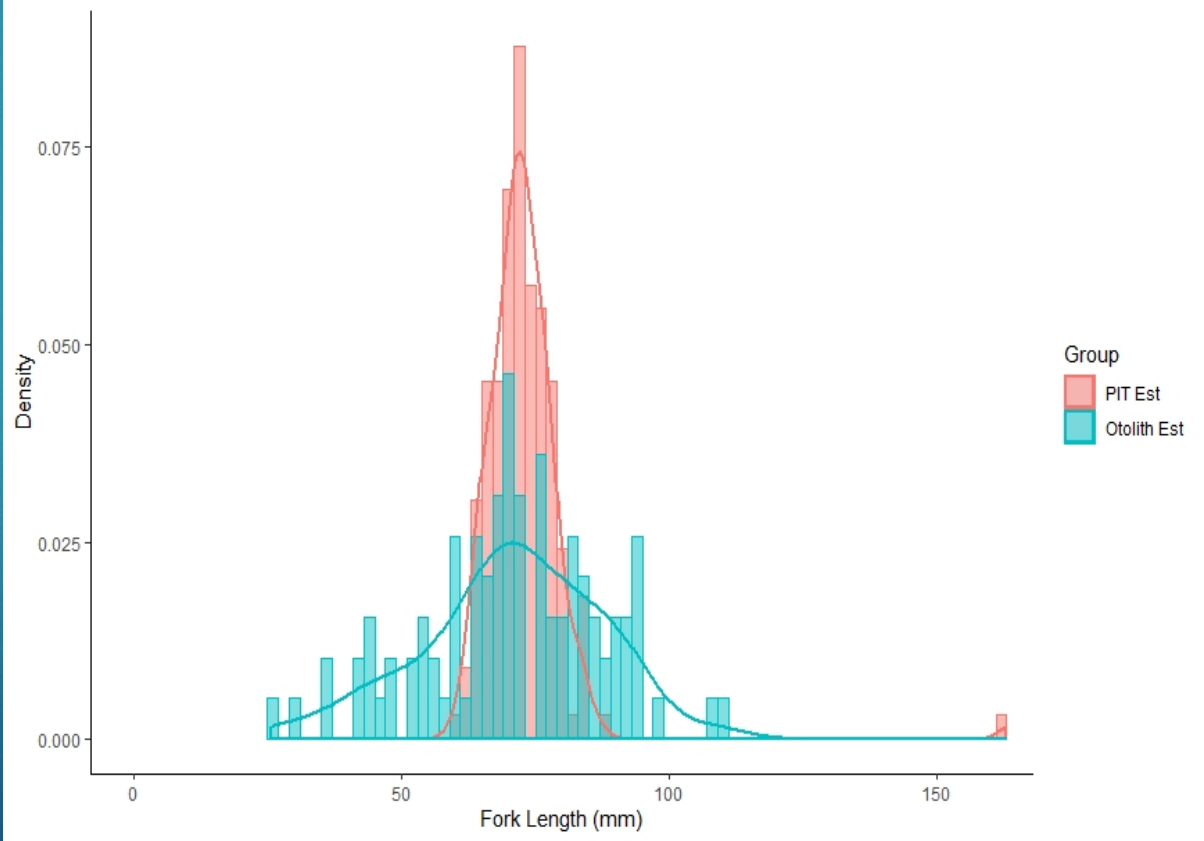
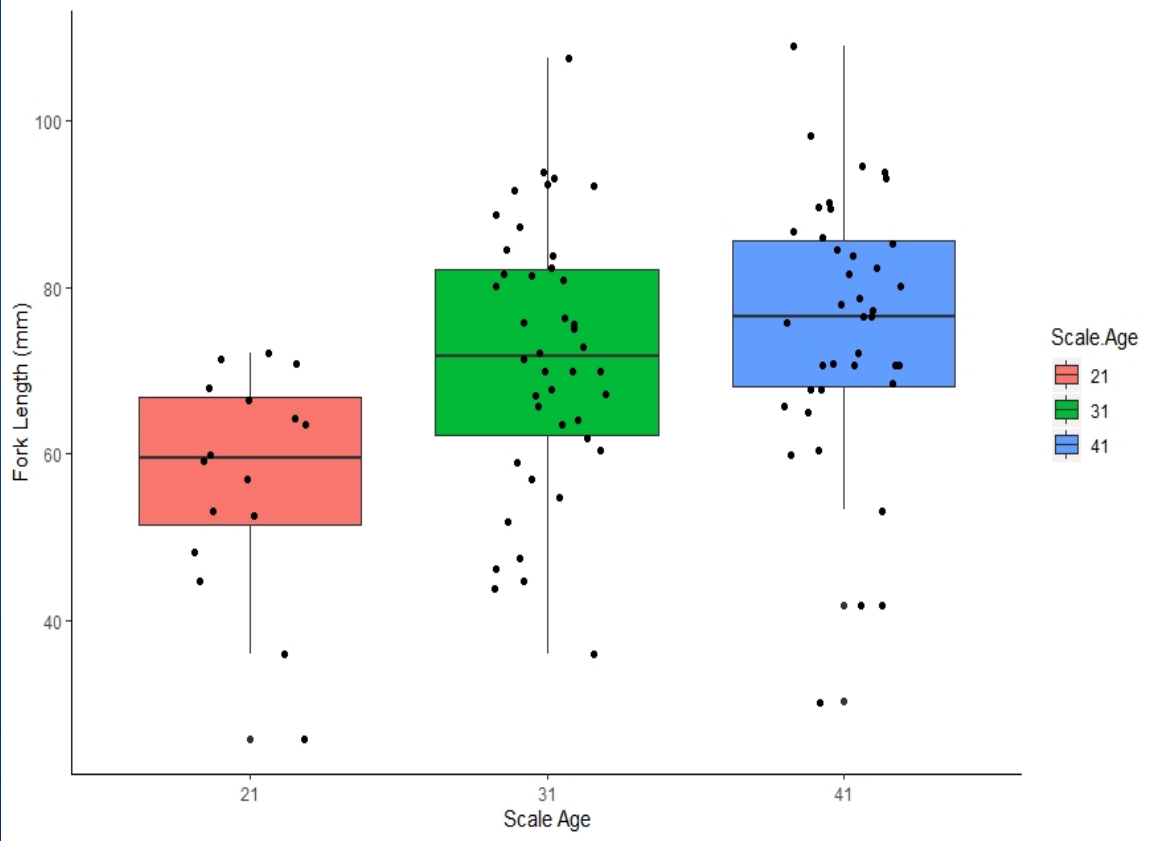
6PPDQ, or N-1,3-dimethylbutyl-N-phenyl-p-phenylenediamine quinone, is an organic chemical that is widely used as an antiozonant and antioxidant in rubber tires (i.e., tire preservative).

In trace concentrations, 6PPDQ can result in '**urban run-off mortality syndrome**' in coho salmon and rainbow trout.

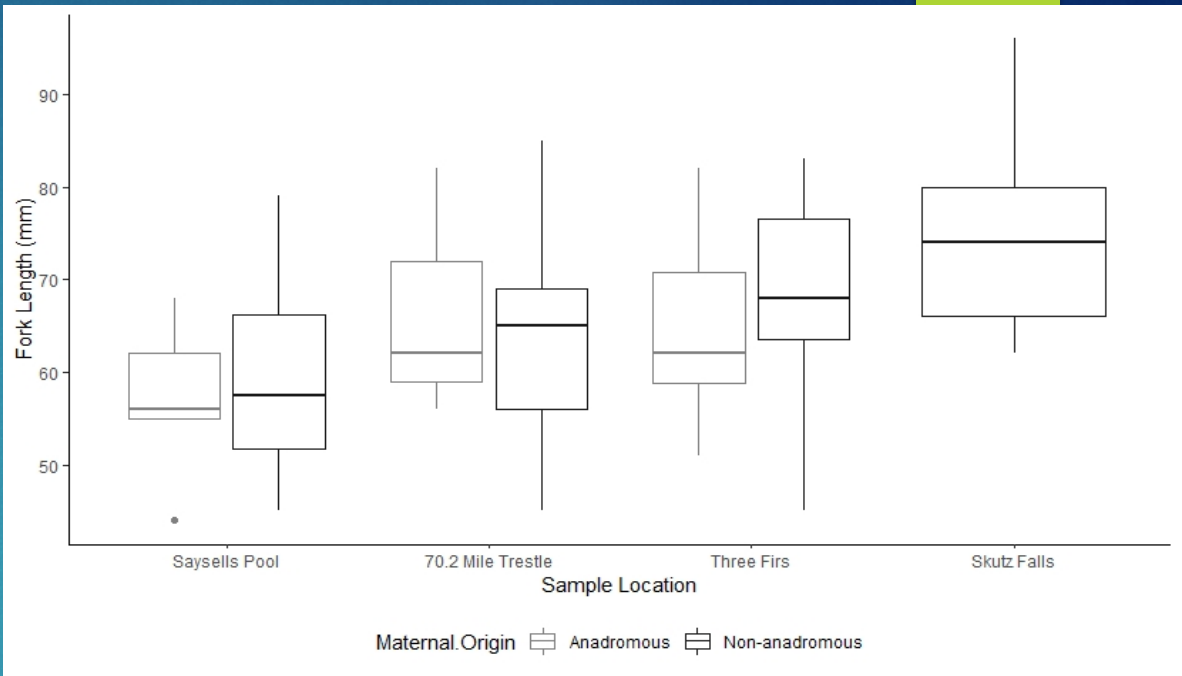
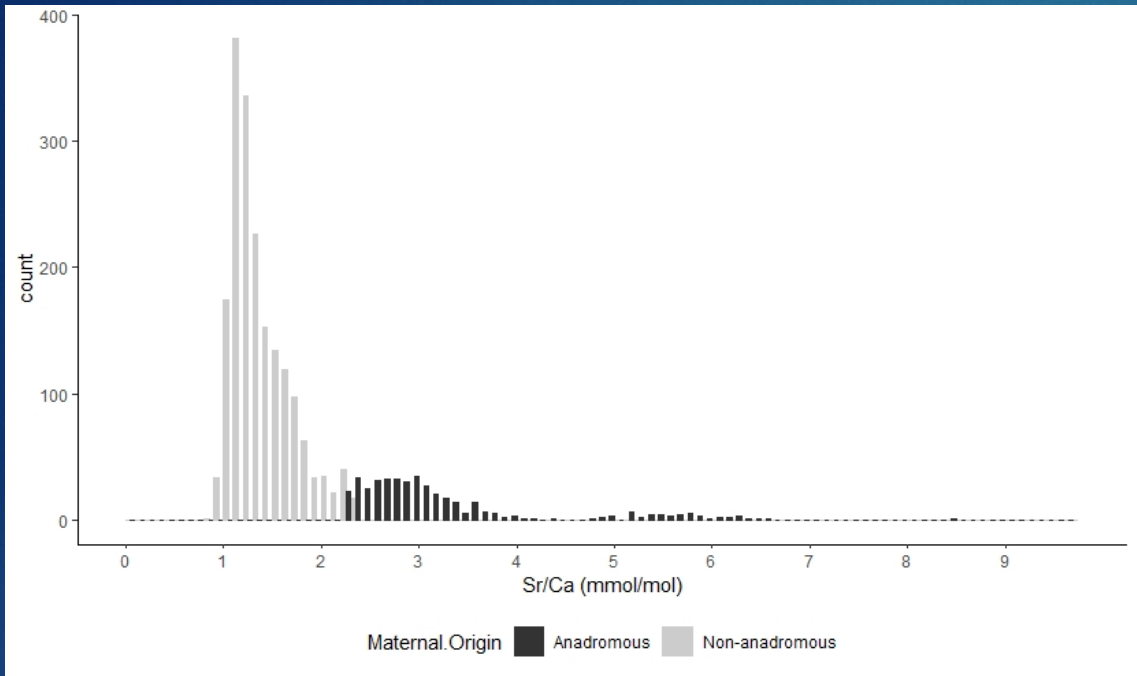


(DFO) Cowichan River Life History Investigations via Otolith Microchemistry - Chinook marine entrance

Life History	Fork Length (mm)	21 (N=16)	Percent of Cohort	31 (N=42)	Percent of Cohort	41 (N=38)	Percent of Cohort
Fry	≤55	6	37.5	7	16.67	4	10.53
Fingerling	>55	10	62.5	35	83.33	34	89.47



Steelhead Maternal Origin



Location	N	Anadromous		Non-Anadromous	
		N	Percent Contribution	N	Percent Contribution
Skutz Falls	13	0	0.0%	13	100.0%
Three Firs	21	10	47.6%	11	52.4%
70.2 Mile Trestle	24	3	12.5%	21	87.5%
Saysell's Pool	29	5	82.8%	24	17.2%
Total	87	18	20.7%	69	79.3%