

CAPTIVE BROODSTOCK PROGRAM FOR THREATENED NOOKSACK RIVER SPRING CHINOOK

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Program Cooperators

- ▣ Lummi Tribe
- ▣ Nooksack Tribe
- ▣ Washington Dept of Fish & Wildlife
- ▣ Northwest Indian Fisheries Commission
- ▣ NOAA Fisheries

Overview

- ▣ Goal of the program
- ▣ Fish & Facilities
- ▣ Challenges of captive brood culture
- ▣ Preliminary results
- ▣ Summary

Program Goal

Conserve genetic resources & restore South Fork Nooksack River spring chinook

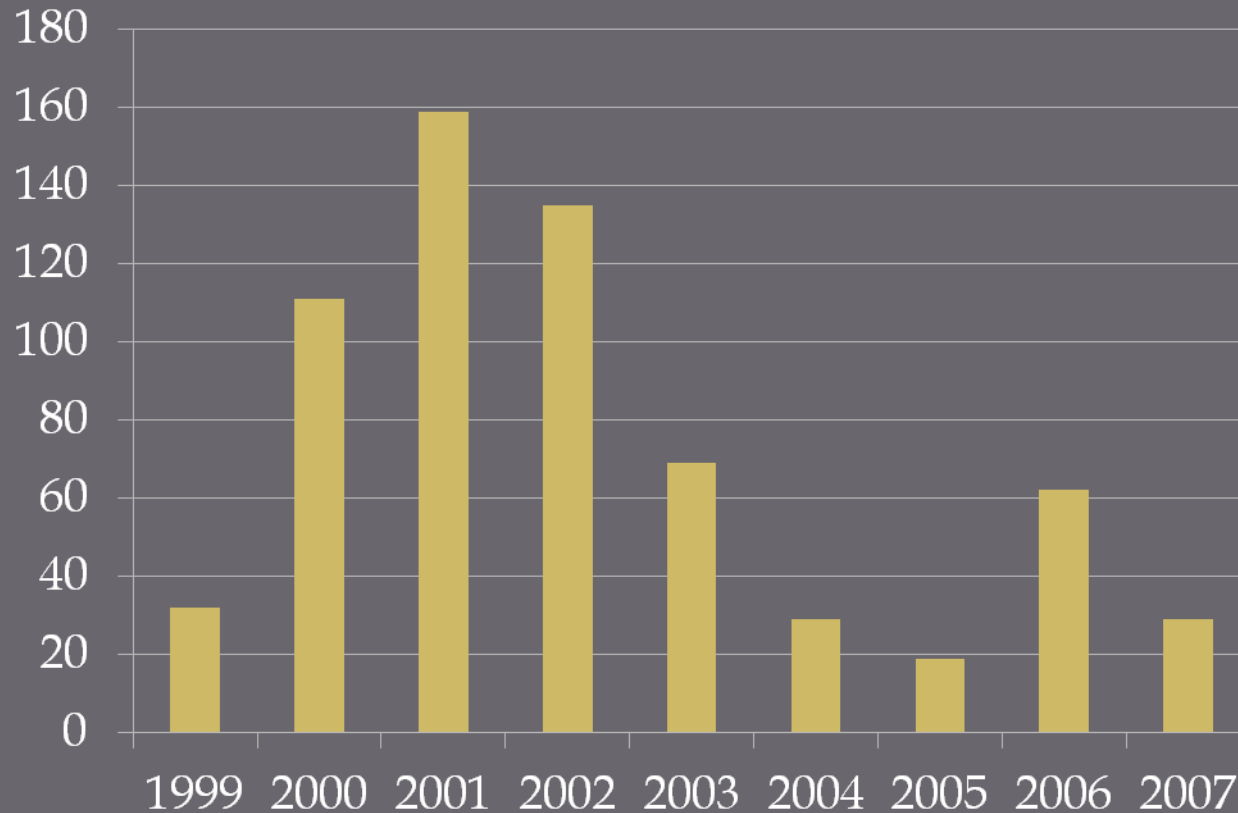
10 year Captive Broodstock program

- Collect 1,000 parr/brood year
- Rear half in FW and half in SW
- Produce 350 spawning females/year
- Release 1,000,000 smolts/year

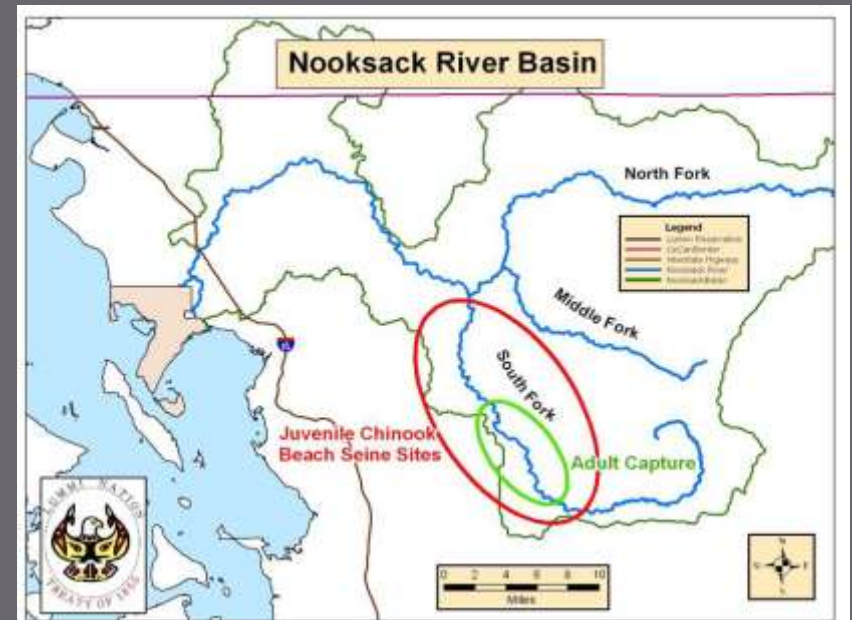
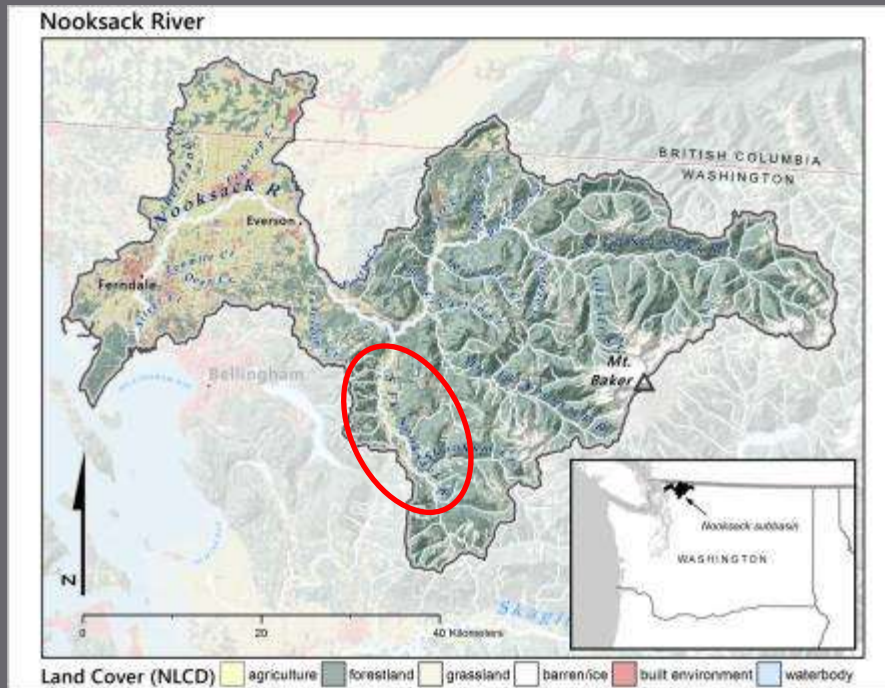
ESA-LISTED SOUTH FORK NOOKSACK RIVER SPRING CHINOOK

- ▣ Listed as Threatened under the Endangered Species Act - 1999
- ▣ Captive broodstock program – 2007
- ▣ Rearing Facilities
 - Kendall Fish Hatchery - WDFW
 - Manchester Research Station – NOAA
 - Skookum Creek Hatchery – Lummi Tribe

ADULT SPAWNER ESTIMATES



Nooksack River Basin



Facilities



Skookum Creek Hatchery (spawning)



Kendall Hatchery (freshwater rearing)



Manchester Research Station
(seawater rearing)

CHINOOK CAPTIVE BROODSTOCK CYCLE

FRESHWATER

Parr



Smolt

6 – 16 mos

SEAWATER

Smolt



Adult

1 – 5 yrs

FRESHWATER

Adult



Spawner

2 – 3 mos

Broodstock sourcing



Broodstock sourcing



Broodstock sourcing

Fry collection using beach seining. Collections made throughout the year as long as water temperatures and conditions are favorable



Broodstock sourcing

Fry transported to Skookum Hatchery. Fin clip to WDFW Genetics Lab for stock ID. Fry held in isolation until ID received



PARR to SMOLT

6 to 16 months

South Fork juveniles reared at Kendall Hatchery for
6 – 16 months dependant on Zero vs Yearling
strategy



Smolt Distribution

Brood Year	Kendall	Manchester
2006	25	0
2007	141	256
2008	500	524
2009	248	438
2010	638	442

Build it and they will come??

Come and they will build it...

SMOLT to ADULT

1 – 5 years

Smolt to Adult rearing equally split between freshwater (Kendall) and seawater (Manchester). Time to Adult dependant upon maturation rate.



SMOLT to ADULT

1 - 5 years

50% of the smolts transferred to SW in May and June
50% of the smolts remain in FW

Reared in variety of circulars from 6' to 20' diameter

1 year post transfer:

- Fish are PIT tagged
- Fin clip for DNA

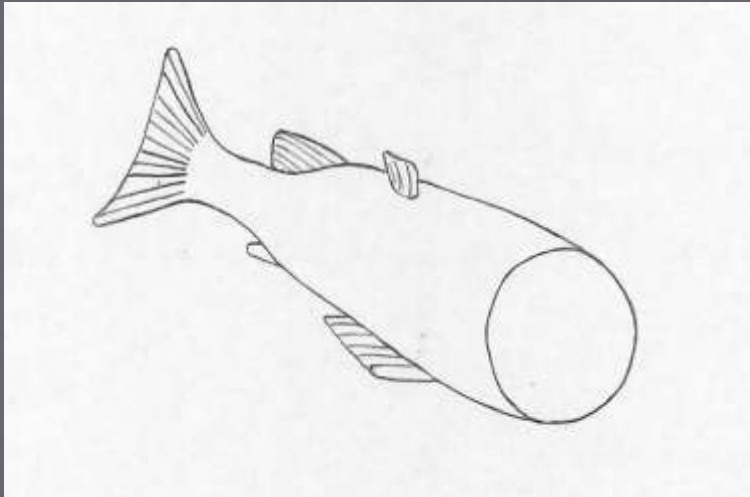
2, 3, & 4 years post transfer:

- Checked for maturity in July
- Transferred to spawn facility in August

Smolt to Adult

1 - 5 years

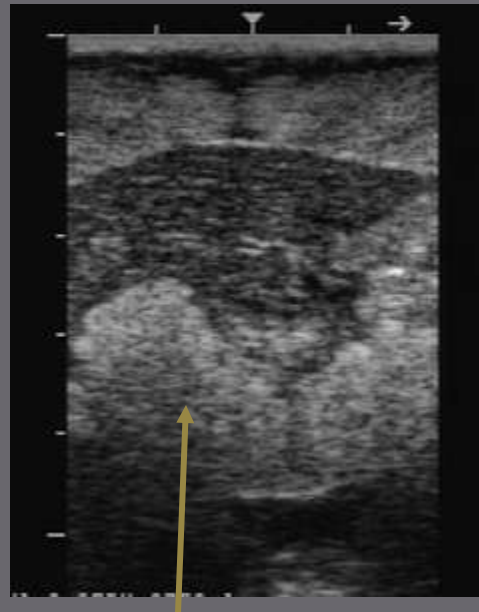
- ▣ Cross-sectional view of the fish.



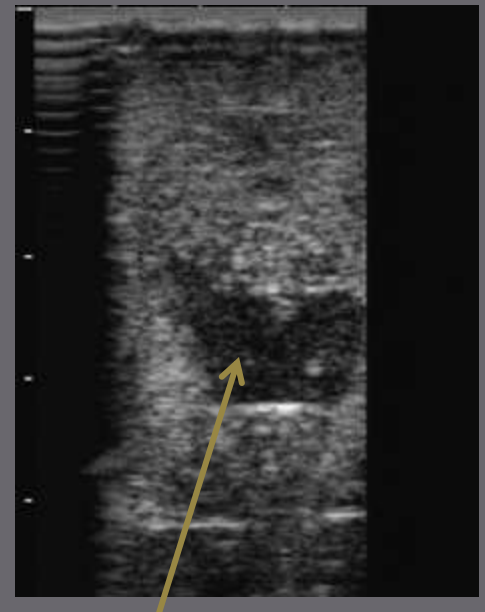
SMOLT to ADULT

1 - 5 years

Maturity sorting using ultrasound (Manchester Research Station)



Eggs



Testes

Adult to Spawner

2 – 3 months

Maturing adults from FW (Kendall) and SW (Manchester):

- Transferred to Skookum Hatchery in August
- Spawned in September and October

2010 – 2 females and 15 males (8 males used)

- 30% egg viability
- 2900 eggs/female

2011 – 20 females and 26 males

- 90% egg viability (73 – 99%)
- 2587 eggs/female (848 – 3813)

RESULTS

5 Brood Years in culture (2006 – 2010)

Survivals >75%

No significant disease issues except low level BKD in BY09

Size at Spawn – 3 to 3.5kg

2000 smolt release in 2011

40,000 smolt release in 2012 (projected)



SUMMARY

Goal – conserve genetic resources & contribute to restoration of South Fork Nooksack spring chinook run

10 year Captive Broodstock Program initiated in 2007

- Collect 1,000 parr/brood year
- Produce 350 spawning females/year
- Release 1,000,000 smolts annually

Capture sufficient South Fork parr (sometimes.....)

High survival in culture

Adult spawner success

Release of F1 smolts

Thanks!!

- ▣ Lummi Tribe
- ▣ Nooksack Tribe
- ▣ WDFW
- ▣ NW Indian Fisheries Commission
- ▣ NOAA Fisheries

**And the Canadian Government for
signing the Pacific Salmon Treaty
which provided funding for this
program!!**