



SQUAXIN ISLAND TRIBE

RESOLUTION NO. 10-43

of the

SQUAXIN ISLAND TRIBAL COUNCIL

WHEREAS, the Squaxin Island Tribal Council is the Governing Body of the Squaxin Island Tribe, its members, its lands, its enterprises and its agencies by the authority of the Constitution and Bvlaws of the Squaxin Island Tribe, as approved and adopted by the General Body and the Secretary of the Interior on July 8, 1965; **and**

WHEREAS, under the Constitution, Bvlaws and inherent sovereignty of the Tribe, the Squaxin Island Tribal Council is charged with the duty of protecting the health, security, education and general welfare of the tribal members, and with protecting and managing the lands and treaty resources and rights of the Tribe: **and**

WHEREAS, The Tribe is a federally-recognized Indian Tribe possessing reserved powers, including the powers of self government:

WHEREAS, the Squaxin Island Tribal Council has been entrusted with the creation of ordinances and resolutions in order to fulfill their duty of protecting the health, security, education, and general welfare of tribal members, and of protecting and managing the lands and treaty resources of the Tribe; **and**

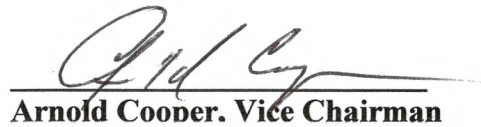
WHEREAS, the Squaxin Island Tribal Council authorizes the Bureau of Indian Affairs (BIA), Northwest Regional Offices (NWRO), to allocate Pacific Salmon Treaty (PST) funds for the Fiscal Year 2010 (FY10), to the Squaxin Island Tribes coho smolt research and data-gathering projects in South Puget Sound.

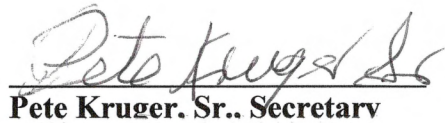
NOW THEREFORE BE IT RESOLVED, that the Squaxin Island Tribal Council adopts the recommended FY10 PST Proposal for funds and the FY09 PST Progress Report presented in the attached documents submitted by Joseph Peters, Fish Biologists of the Squaxin Island Tribe.

CERTIFICATION

The Squaxin Island Tribal Council does hereby certify that the foregoing Resolution was adopted at the regular meeting of the Squaxin Island Tribal Council, held on this 8th day of April, 2010 at which time a quorum was present and was passed by a vote of 4 for and 0 against with 0 abstentions.


David Lopeman, Chairman


Arnold Cooper, Vice Chairman


Pete Kruger, Sr., Secretary

The Honorable David Lopeman
Chairman
Squaxin Island Tribe
10 Southeast Squaxin Lane
Shelton, Washington 98584-9200

Dear Chairman Lopeman:

Please be advised that Fiscal Year 2010 funds, in the amount of \$55,692, are available to the Squaxin Island Tribe for Pacific Salmon Treaty (PST) research and data-gathering projects. To access these funds, please submit a research proposal, a budget proposal, a performance report for activities associated with the use of these funds in Fiscal Year 2009 (FY09), and a tribal resolution to the Bureau of Indian Affairs (BIA), Northwest Regional Office, ATTN: Rick Cook. These documents should be submitted so that they arrive in this office no later than April 30, 2010. Unlike years prior to FY09, **funds for which we do not receive a project proposal, a budget proposal, a performance report, and a tribal resolution by April 30, 2010, will be re-allocated.** A courtesy copy of your research proposal and performance report should also be submitted to the Northwest Indian Fisheries Commission, ATTN: Ron Olson.

Please refer to the attached PST Research Project Criteria when developing project proposals, bearing in mind that that this funding is intended only for research, data gathering, and fishery improvement projects. In addition, to the extent practicable, project proposals and performance reports should be prepared in a manner that is consistent with the format outlined in the attached examples. Finally, please do not include indirect costs in your submissions—these funds are calculated separately by the BIA Northwest Regional Office and the Office of Self Governance.

If you have any questions regarding this matter, please contact Rick Cook, Fisheries Biologist, at (503) 872-2878.

Sincerely,

Northwest Regional Director

Enclosures

**ANNUAL NARRATIVE PERFORMANCE REPORT
PACIFIC SALMON TREATY IMPLEMENTATION PROJECTS
FY-2009
SQUAXIN ISLAND TRIBE**

Name of Project: South Puget Sound Coho Production Investigation

Year of Report: FY-2009

Description of Project

Introduction

The Squaxin Island Tribe initiated a data collection and research study in 1999 to estimate the number of coho salmon smolts outmigrating from Mill, Cranberry and Goldsborough Creeks. These three creeks are located in South Puget Sound, Management Area 13J. The project objectives include using weirs and mark/recapture methodology to enumerate and monitor downstream migration of coho salmon smolts, providing data for estimation of natural coho production, development or regional wild coho forecast and for the formation of relevant spawning escapement goals for Deep South Puget Sound region. The Squaxin Island Tribe has continued these studies through 2009 on Goldsborough, Mill and Cranberry Creeks.

Washington Department of Fish and Wildlife (WDFW) began smolt trapping on Mill Creek in 1976 and continued through 1986 (Lenzi 1983, Lenzi 1985, Baranski 1989). This historical data can be used as a comparative to determine temporal changes in the number of smolts produced in the watershed. Specific objectives of this effort are to determine the current downstream smolt migration timing and level of smolt production in each system. In addition, the information collected on outmigrants will begin the first step to produce a spawner/recruit relationship that will help define adult spawning escapement goals for Management Area 13D-K

With the removal of the Goldsborough Creek Dam in 2001, the Squaxin Island Tribe and U.S. Army Corps of Engineers worked together on implementing a post dam removal monitoring of juvenile salmonids within the project reach. The enumeration and monitoring downstream migration of juvenile salmonids in Goldsborough Creek will provide a useful database to evaluate the success of the dam removal and restoration site. Goldsborough Creek was also monitored 1999-2001 prior to dam removal.

In 2009, the Squaxin Island Tribe also continued its investigation of South Puget Sound coho production on Schumacher Creek and Sherwood Creek in Case Inlet North Bay watershed (Management Area 13K).

The limited understanding of current coho salmon production in South Puget Sound precludes the development of rational, adaptive, management decisions concerning harvest, habitat enhancement, and artificial production. This study continues the current/past efforts by The Tribe and State of Washington to gather information on production levels by enumerating outmigrating smolts. Currently, the Deschutes River spawner/recruit relationship is use to describe conditions in other creeks in the area. This relationship may be incorrect given the

extreme variability between the Deschutes River and large number of coho producing creeks in the South Puget Sound region.

Stock relevance and significance to the Pacific Salmon Treaty

In terms of production, one need identified by regional fisheries managers was to continue to develop a spawner/recruit relationship of terminal South Puget Sound coho salmon that could be incorporated into the Puget Sound coho runs size forecasting methodology. In addition, monitoring South Sound coho production is needed to address current regional smolt production levels to manage enhancement and/or supplementation questions.

Estimating the current production of terminal South Puget Sound coho salmon stocks is of primary concern when reviewing whether adult escapement goals are adequate. Additionally, quantifying population parameters such as smolt production contribute relevant data with which to develop sustainable harvest opportunities, evaluate problematic changes in the habitat or environmental conditions, and improve management of fisheries in an artificial production related fishery arena. Since the early 1980s, the adult coho escapement into Management Area 13D-K has been variable and the spawning escapement was passively managed.

Project Methods

A weir smolt trap was installed on Mill, Cranberry, Schumacher, and Sherwood Creeks below observed coho spawning locations thus capturing a representative number of outmigrating smolts.

Due to the high, spring stream flow, Goldsborough Creek precludes weir installation in the lower watershed that would enumerate the entire outmigrating population. Instead, a rotary screw trap was installed at river kilometer 0.5 to ensure capture of outmigrating coho smolts leaving Coffee Creek, a tributary of Goldsborough Creek, yet upstream from tidal influenced waters. Standard mark/recapture methodology was used to calculate the trapping efficiency.

Each trap site was checked at least once a day, twice during peak migration. All salmonids captured in the traps were enumerated and measured; non salmonid species were identified and enumerated.

To standardize methodology with passed studies each smolt trap, installation was targeted for the first week of April and remained installed through the third week of June (Lenzi 1983, Lenzi 1985, Baranski 1989).

Analytical Project Results

For the current year smolt traps were installed on Mill, Cranberry, Schumacher, Sherwood and Goldsborough Creeks in early April 2009. The screw and weir traps were operated according to standard methodology developed through training and previous project experience.

Cranberry Creek

Cranberry Creek mean coho outmigration typically occurs April 4th through June 27th. Peak outmigration of coho smolt in Cranberry Creek generally occurs within the last week of April into the first week of May (Chart 1). In 2009 an estimated 2,072 coho smolts were encountered at the Cranberry Creek trap (Table 1).

Spring 2007, Cranberry Creek smolt trap was relocated down stream 1.8 km, to a location below the major coho spawning locations in this stream, ensuring that a representative number of outmigrating smolt were captured. In the previous three years, our trapping efforts were moved upstream due to a lack of cooperation from local landowners in the area. Data from 2004 through 2006 showed considerable decline in coho production suggesting that the trap location may have been above the major coho spawning areas in Cranberry Creek (Table 1).

Mean coho production for this same location in the years 1999-2003; 2005-2009 is 2831 coho smolt.

The Cranberry Creek trap also collected coho fry, and chum salmon; cutthroat and steelhead trout, sculpin, shiners, crawdads, lamprey, sticklebacks, and dace.

Mill Creek

Migration timing on Mill Creek extended from April 22nd through June 16th. Peak timing occurred between the second and third weeks of May, somewhat later than Cranberry Creek (Chart 2). There were 5,824 coho salmon smolts enumerated plus additional species represented identical to the Cranberry Creek watershed.

Skookum Creek

Skookum Creek coho smolt outmigration timing typically occurs April 3rd – June 14th with peak out migration occurring within the second week of May (Chart 3). Skookum Creek recent five year average ('08-'04) coho production is 1,273 coho smolt.

Due to insufficient amount of gravel bags and the unfavorable changes to the creek channel at the trap location the previous fall and winter, trapping of Skookum Creek was suspended for 2009.

Goldsborough Creek

Goldsborough Creek mean coho smolt outmigration approximately occurs April 2nd through June 30th; with peak outmigration generally taking place within the first week of May (Chart 4).

Using Peterson's Mark/Recapture Methodology we were able to calculate the screw trap catch efficiencies three separate times throughout the smolt trapping season. Lower lobe caudal fin clips were used to mark coho and were released up stream of the screw trap just below the 7th Street / Angleside Road Bridge that crosses Goldsborough Creek. The three efficiencies resulted in a mean trap efficiency of 24.91%. Using the screw trap efficiency, Goldsborough production of coho smolts was estimated by using the following formula:

$$n = C/\hat{E} j$$

n Estimated number Smolts, C total catch in trap j, \hat{E} efficiency

Assuming that there was no mortality of marked fish after release and that all marks were properly observed by staff, the estimated production of out-migrants for the Goldsborough watershed in 2009 was 40,191 coho smolts. Recent five year ('05-'09) mean of coho production for Goldsborough is 27,762 smolt.

During the smolt trap monitoring in Goldsborough Creek, additional species caught throughout the trapping period, included: coho fry, Chinook fry, and chum fry; cutthroat, steelhead, stickleback, sculpin and lamprey.

Schumacher Creek

The Squaxin Island Tribe added Schumacher Creek of the Case Inlet/North Bay watershed to our smolt trapping studies. Schumacher Creek is an upper basin tributary to Sherwood Creek that flows in to Mason Lake. The intent of this trap was to observe the total amount of coho smolt originating from above Mason Lake and the contribution to the total coho production of Sherwood watershed.

The outmigration of coho in Sherwood Creek occurred April 9th- June 2nd, with peak outmigration taking place within the second week of May. Immediately into the trapping of this creek we encountered a massive amount of spawning *Mylocheilus caurinus* aka Peamouth. Many weeks we had trouble keeping the live box clear of peamouth. Eventually we placed a gap in the trap to allow passage of these peamouth. Unfortunately a gap does not trap coho efficiently, requiring us to use Peterson's Mark/Recapture Methodology to calculate the total coho smolts. With a mean trapping efficiency of 38.0% we calculated a total of 3774 coho smolts leaving Schumacher Creek.

We are unable to determine the total contribution to the Sherwood coho production due to unknown predation and mortality in Mason Lake. We can conclude that juvenile coho utilize Schumacher Creek and that there is some survival of these fish to Sherwood Creek (a few marked fish from mark/recapture were observed in Sherwood trap).

Other species seen in the trap throughout the study included: cutthroat, sculpins, shiners, dace, and peamouth.

In 2010 the Tribe has decided not to install a trap on Schumacher Creek due to the peamouth spawning. Trapping of Schumacher Creek may be necessary in years to come to support prospective watershed projects.

Sherwood Creek

Sherwood Creek coho outmigration generally takes place April 2nd–June 27th, with peak outmigration occurring within the second week of May (Chart 6). There were 10,003 coho

salmon smolts enumerated with other species encountered include coho fry, chum, cutthroat, steelhead/rainbow, sculpin, shiner, dace, lamprey, sunfish, and bass.

Sherwood natural coho production for 2009 appears to mirror the mixed natural and artificial production of 2003, suggesting that recent replacement of Schumacher and Anderson culverts may have provided more spawning opportunities for returning adult coho and opened up overwintering habitat for juvenile coho.

Established Objectives an Ongoing Effort

It is important to continue this study to provide the enumeration and assessment of outmigrating coho smolts. Quantifying population parameters such as smolt production contribute relevant data with which to develop South Puget Sound wild coho forecast, sustainable harvest opportunities, evaluate problematic changes in the habitat or environmental conditions, and improve management of fisheries in an artificial production related fishery arena.

Table 1: 1999-2009 Coho Smolt Production Estimates for Cranberry, Skookum, Mill, Goldsborough, Johns, and Sherwood Creeks.

Year	Cranberry ¹	Mill	Skookum	Goldsborough ²	Johns	Sherwood ⁵
1999	3685	5855	*	12209	*	*
2000	4006	8078	*	14048 ³	*	*
2001	3775	165	462	1014 ⁴	*	*
2002	2839	280	1484	6090	*	*
2003	4916	6709	1030	61844	964	10258
2004	599	19	291	5574	123	2341
2005	175	44	974	11944	83	3858
2006	71	1449	1518	42729	99	2671
2007	814	426-1490 ⁶	1186	16534	*	3231
2008	788	1015-2012 ⁶	2376	27411	122	1665-2165 ⁶
2009	2072	5824	*	40191	*	10003

¹ 2004-2006 Cranberry Trap was relocated upstream due to land owners.

² Goldsborough estimates are based on screw trap catch and trap capture efficiencies

³ 2000-Goldsborough Trapped by USFW. Coho are Egg tube and Natural Coho (2000 Celedonia)

⁴ 2001- Goldsborough Trapped by USFW (2001 Missildine)

⁵ 2003-2006 Sherwood numbers are mixed Natural Coho and RSI's releases

⁶ Estimated production range -Late to Mid-May washouts. Mill wash outs May 19th. SherwoodTrap washed out on May 23. Applied past year's averages for estimate.

Chart 1: Cranberry Creek Weekly Mean Coho Outmigration Timing (1999-2003, 2007-2009)

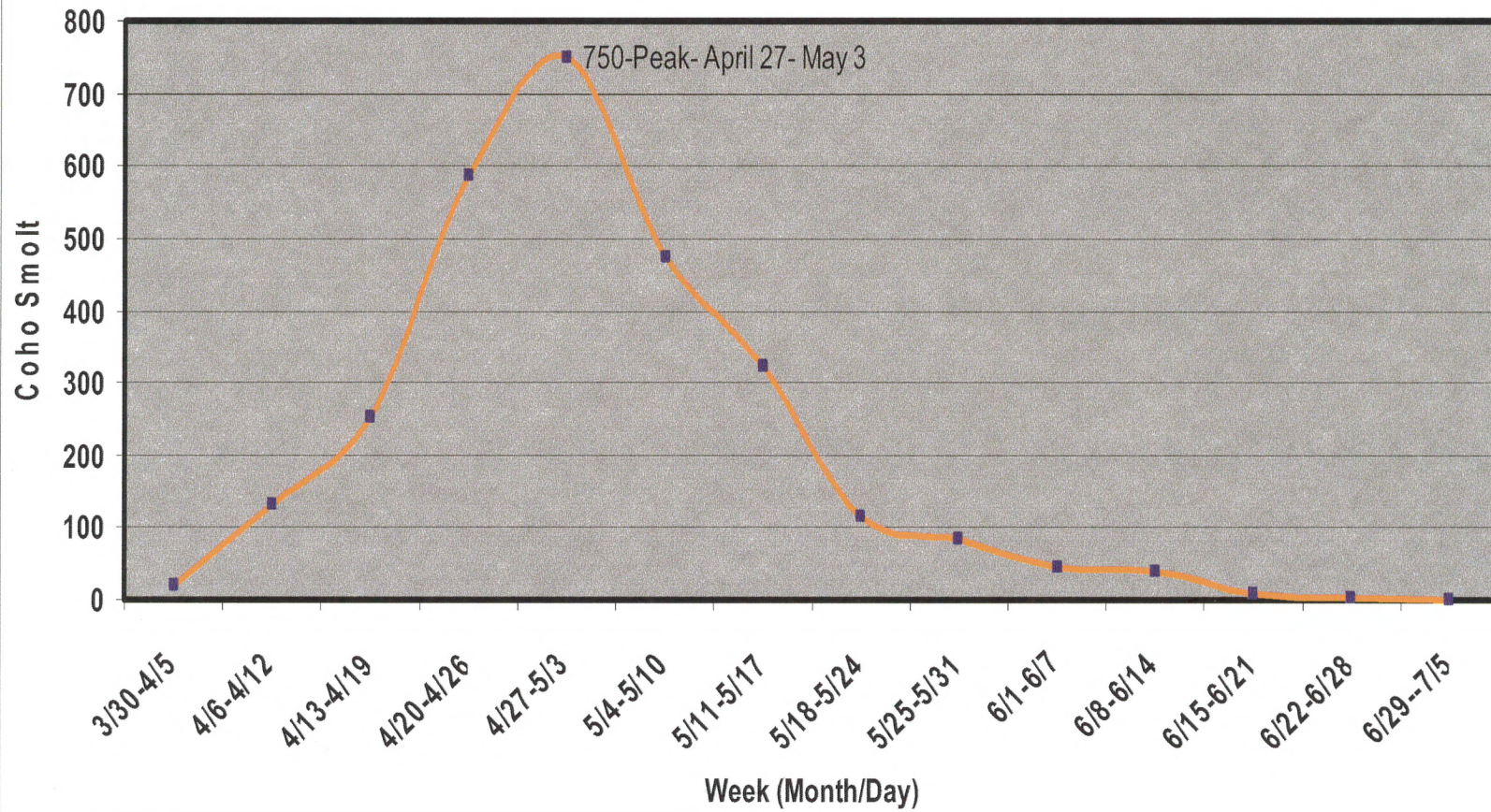


Chart 2: Mill Creek Weekly Mean Coho Outmigration Timing (1999-2009)

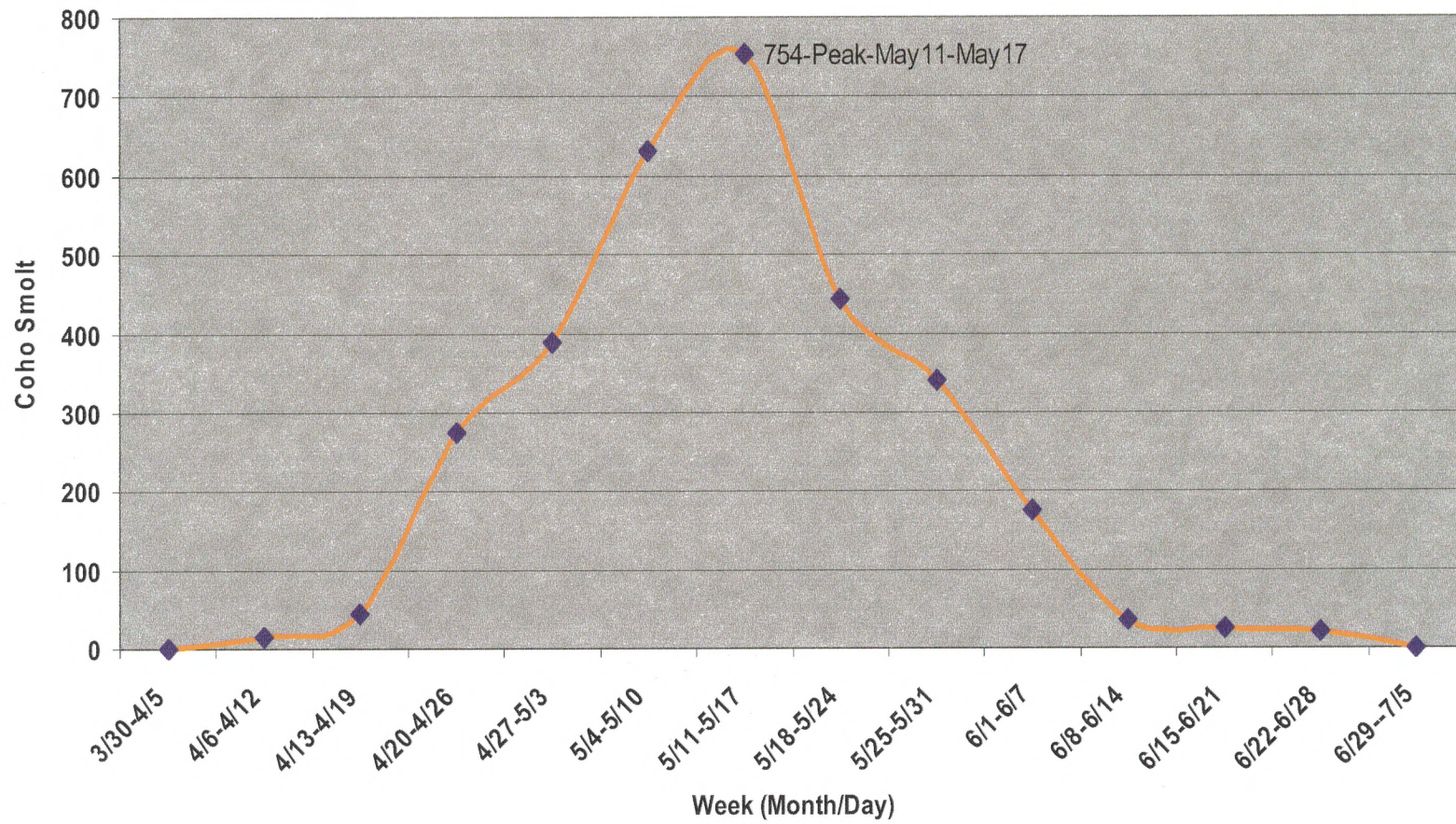


Chart 3: Skookum Creek Weekly Mean Coho Outmigration Timing (1999-2008)

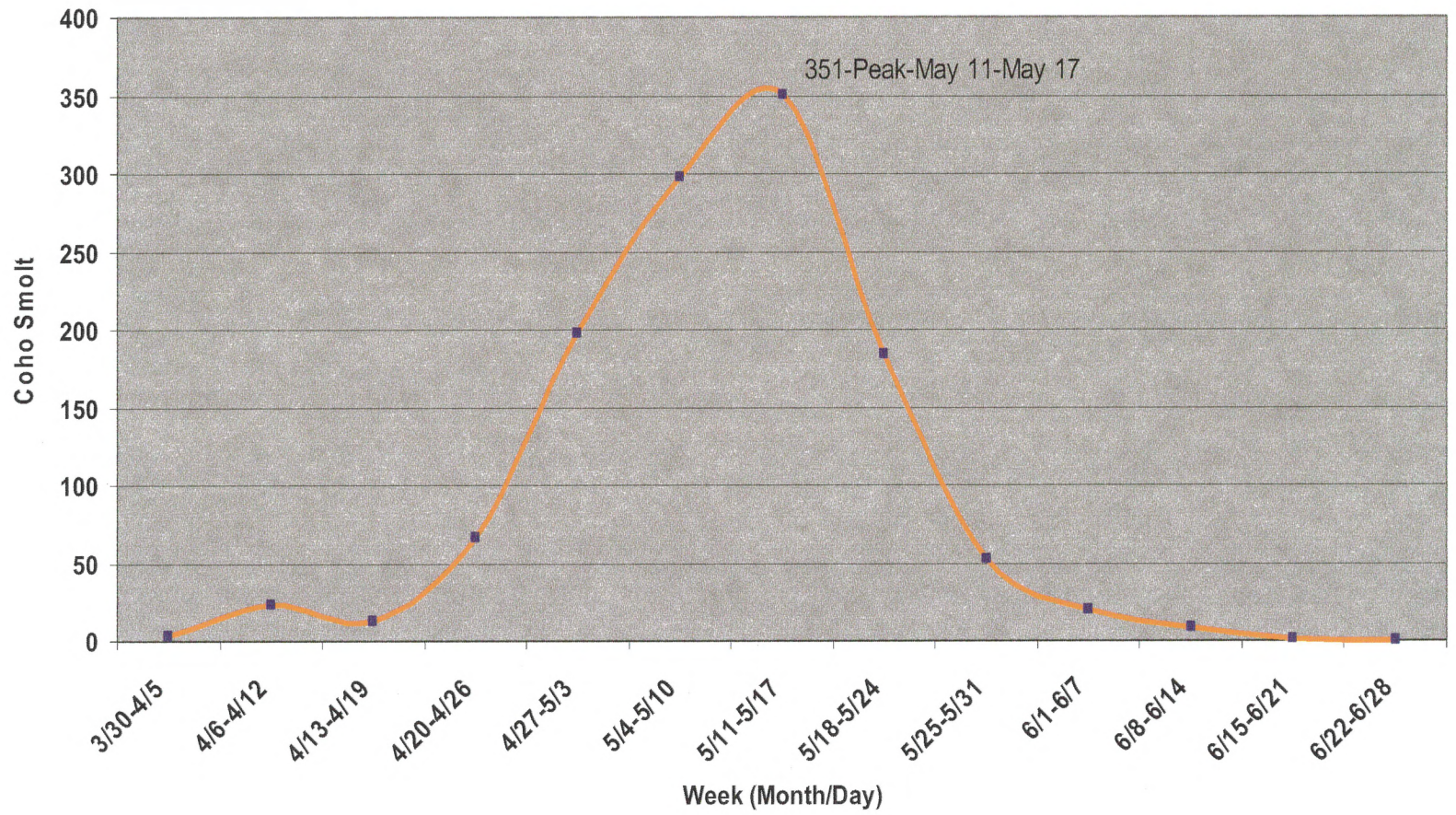


Chart 4: Goldsborough Creek Weekly Mean Coho Outmigration Timing (2003-2009)

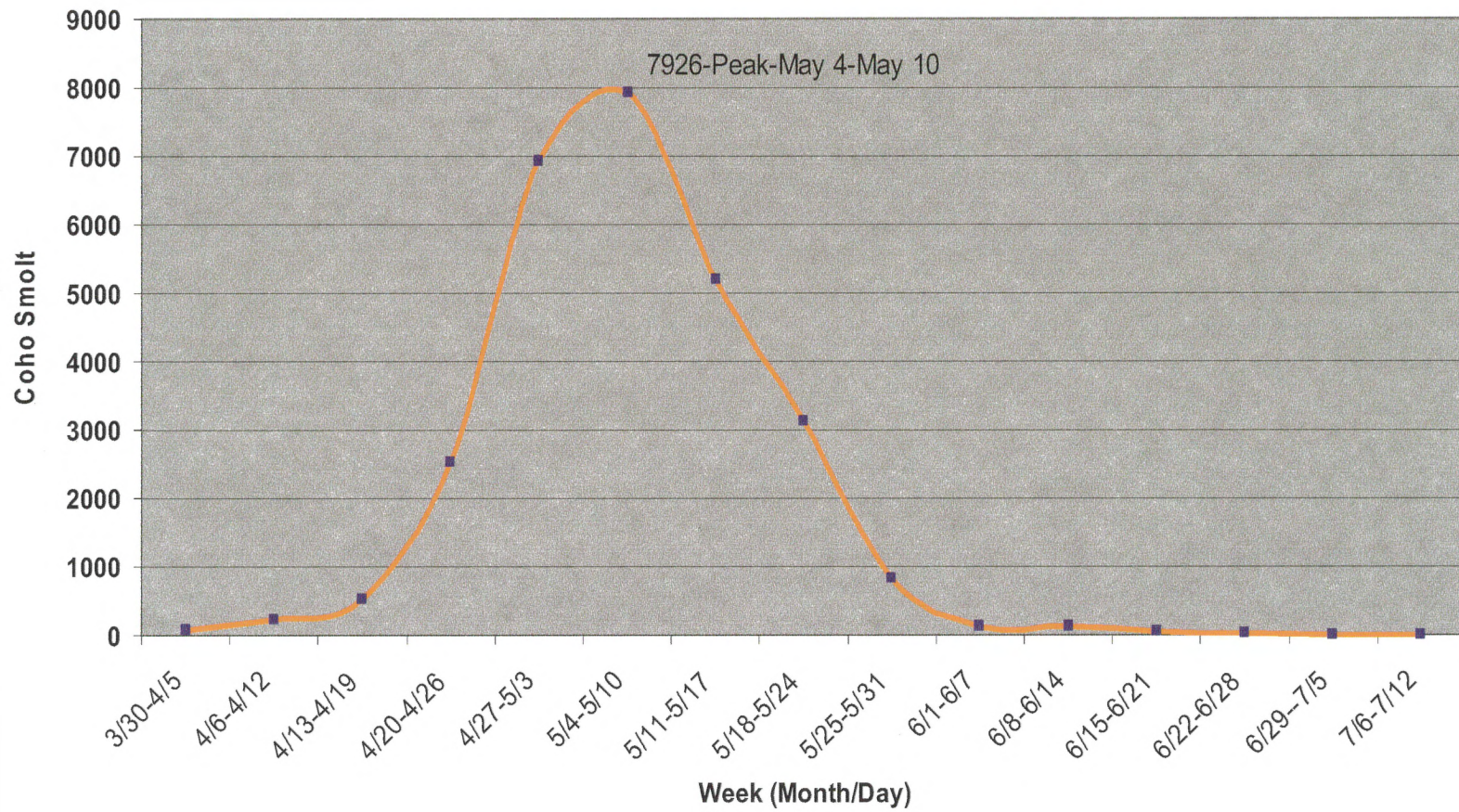
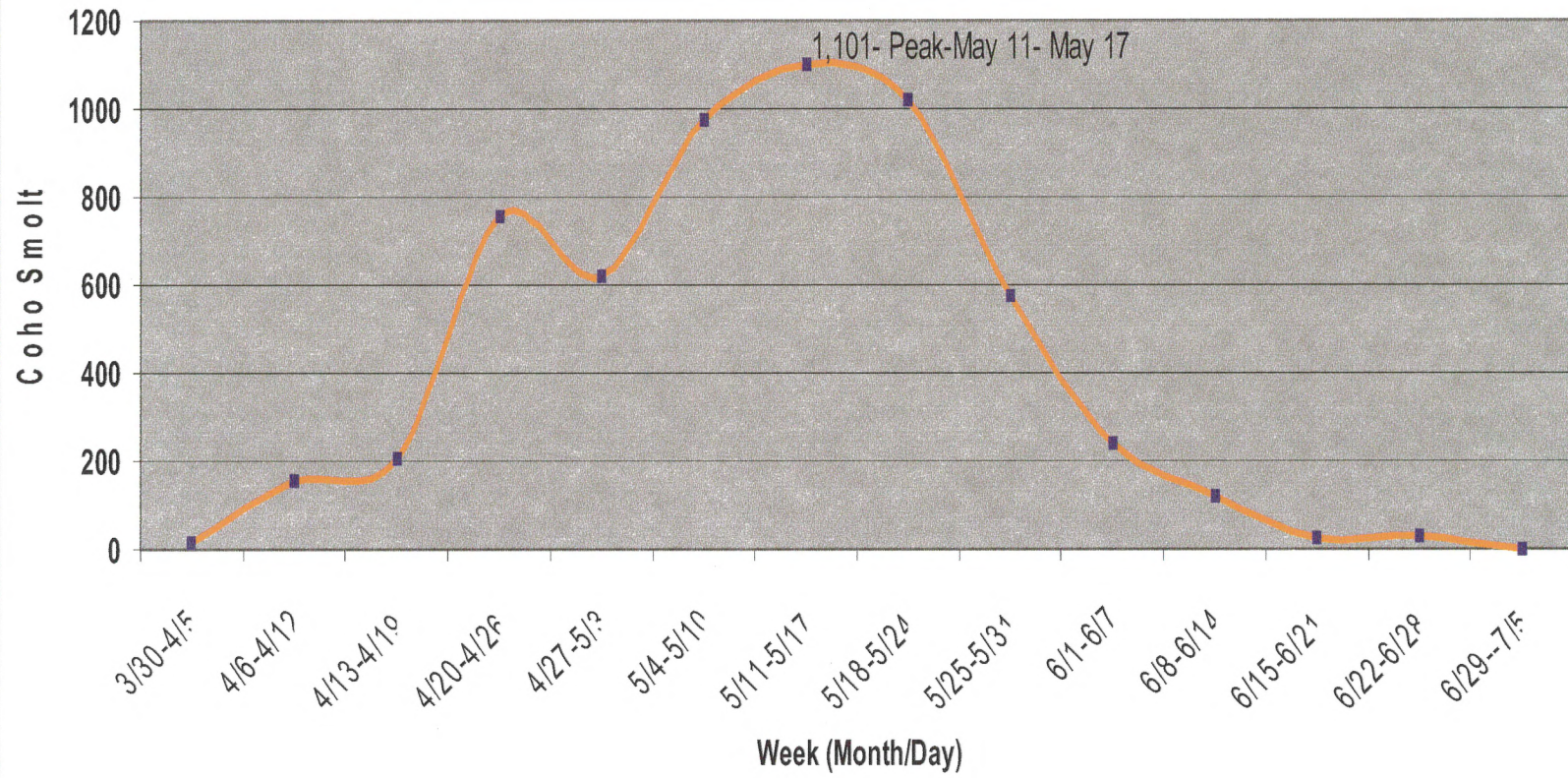


Chart 5: Sherwood Creek Weekly Mean Coho
Outmigration Timing (2003-2009)



REFERENCES

Baranski, C. 1989. Coho smolt production in ten Puget Sound streams. Wash. Dept. Fish. Tech. Rept. No. 99. 29p.

Celedonia, Mark T. Peters, Roger J. Missildine, Brian R. 2000. Pre-Dam Removal Monitoring of Goldsborough Creek Washington: 2000 Smolt Trapping Study. U.S Fish and Wildlife Service. 11 p, 30&31 p.

Lenzi, J. 1983. Coho smolt enumeration on several small Puget Sound streams. 1978-1981. Wash. Dept. Fish. Prog. Rept. No. 199. 92 p.

Lenzi, J. 1985. Coho smolt enumeration on several small Puget Sound streams. 1982-1984. Wash. Dept. Fish. Prog. Rept. No. 232. 61 p.

Missildine, Brian. 2001. 2001 Goldsborough Creek Smolt Trapping Study. U.S. Fish and Wildlife Service. 4-7 p.

**PACIFIC
SALMON TREATY IMPLEMENTATION FUNDING
PROPOSAL FY-2010**

PART I - PROJECT DESCRIPTION

1. **Tribe:** Squaxin Island Tribe
2. **Name of Project:** South Puget Sound Coho Production Investigation
3. **Type of Project:** Coho Salmon Smolt Data Collection and Research
4. **Continuation of Existing Project:** Yes
5. **Project Objectives:** Monitor downstream outmigration timing of coho salmon smolts using weirs, rotary screw traps and mark/recapture methodology. Enumeration and estimation of outmigrating smolts will be used to provide data to estimate natural coho salmon production and begin to form relevant spawning escapement goals. WDFW began smolt trapping on Mill Creek in 1976 and continued through 1986 (Lenzi 1983, Lenzi 1985, Baranski 1989). In the ensuing years adult escapement has been variable and the spawning escapement goals were passive. Specific objectives of this effort are to determine the current downstream smolt outmigration timing and level of smolt production in Mill, Goldsborough and Cranberry Creeks in the Hammersly Inlet/Oakland Bay watershed; Sherwood Creek in the Case Inlet/North Bay watershed. In addition, the information collected on outmigrants will begin the first step to produce a spawner/recruit relationship that will help set adult spawning escapement goals.

PART II. RELEVANCE AND SIGNIFICANCE TO PACIFIC SALMON TREATY

6. **Stock Relevance to PST.** In terms of production, one need identified by regional fisheries managers was to continue to develop a spawner/recruit relationship of terminal South Puget Sound coho salmon that could be incorporated into the Puget Sound coho run size forecasting methodology. In addition, monitoring South Sound coho salmon production is needed to address current regional smolt production levels which address enhancement and/or supplementation questions.

Estimating the current production of terminal South Puget Sound coho salmon stocks is of primary concern when reviewing whether adult escapement goals are adequate. Additionally, quantifying population parameters such as smolt production contribute relevant data with which to develop sustainable harvest opportunities, evaluate problematic changes in the habitat or environmental conditions, and improve management of fisheries in a production-related fishery arena.

PART III. OTHER BENEFITS

7. Comprehensive Coho Management Comprehensive coho management requires that natural spawning populations of salmon be protected and sustained. Understanding the life history and production of those populations in terminal South Puget Sound are necessary to addressing those goals. Also, providing an inventory of selected streams exhibiting natural spawning and their current levels of production directly addresses the needs of wild stocks in the management framework for the Wild Stock Restoration Initiative for coho salmon. A survey of coho salmon from watersheds in terminal South Puget Sound will act as a current inventory of natural production in the region.

The limited understanding of current coho salmon production in South Puget Sound precludes the development of rational and adaptive management decisions concerning harvest, habitat enhancement, and artificial production. This proposal continues the past effort by the State of Washington to gather information on production levels by enumerating outmigrating smolts. Currently, the Deschutes River spawner/recruit relationship is used to extrapolate to other creeks in the area. The assumptions made about the usefulness of the relationship may be incorrect given the extreme variability between the Deschutes River and other creeks in the region as well as the artificial origin of the Deschutes coho run.

WDFW believes the natural population on the Deschutes River is failing due to production problems above Tumwater Falls, and this stock is no longer useful as an indicator for the rest of Deep South Puget Sound. Thus, continued collection of natural spawning stock production data in multiple Deep South Sound streams is essential in describing conditions in South Puget Sound for pre-season management and forecasting.

PART IV. PROJECT DESIGN AND EVALUATION

8. Approach/Methods: A weir will be installed on Mill, Cranberry, Skookum and Sherwood Creeks at a site below observed coho spawning locations thus, capturing all outmigrating smolts. A screw trap will be installed in Goldsborough Creek watershed to be used in standard mark/recapture methodology. Outmigrating coho salmon smolts will be captured, enumerated and lengths measured.

Traps will be installed late March into the first week of April and remain through the end of June depending on whether fish are still being captured at the weir (Lenzi 1983, Lenzi 1985, Baranski 1989). Gaining access through private property will be needed at all weir sites and the screw trap site.

Nonpermanent structures placed in water systems have the potential to be washed out due to high water flows and as such, are a project risk. All weirs and screw trap will be monitored two or more times a day and a trash rack will be installed upstream from all three structures. In the event that a weir washes out, the smolts outmigrating past the

weir will be estimated by standard methods. Other risks taken under consideration were the design of the mark/recapture sampling methodology and its ability to produce usable data. If overall escapement in Goldsborough Creek was low, producing few outmigrating smolts and the screw trap efficiencies were also low, and then the ability to collect the required sample size in the screw trap may be compromised. Placement location of the screw trap will necessarily be where the trap will be most affective at capturing smolts to obtain a statistically representative sample.

9. Assumptions: Several assumptions will be made concerning the trapping methodology itself. One assumption made is that the duration of time that the weir is in place encompasses the majority, if not the entire time period that smolts are outmigrating. The ability to modify this assumption will be post experiment. A second assumption concerns the location of the weir; where the chosen location is assumed to be below habitat where pre-smolts are rearing. Thus, the trap can capture all outmigrating smolts in the watershed. A third assumption made involves the mark/recapture creek, where the population marked is assumed large enough to be collected in the screwtrap and be of statistical significance in estimating the outmigrating population. We also assume that no mark recapture is necessary on weir trap streams.

10. Analysis: Current estimated coho production density values can be derived by dividing the estimated smolt outmigrants by several previously measured habitat parameters. Such values may lead to estimating if creeks are underseeded, particularly when compared to past smolt trapping studies.

11. Evaluation: Performance of this proposal will be evaluated via the successful trapping, marking, and recovery of outmigrating coho smolts. Success may lead to trapping additional creeks in terminal South Puget Sound in subsequent years to gain further information on regional coho productivity.

12. Products: A technical report will be generated and made available to run size forecasting management personnel within the WDFW and the Tribal community.

13. Key Personnel: Joseph Peters, Fish Biologist, will act as project leader. Other supporting staffs are Scott Steltzner, Fish Research Biologist, and permanent and temporary employees of the Squaxin Island Tribe will perform weir manufacture and installation, monitoring, and marked smolt recovery.

PART V - COSTS:

14. Costs expected for FY 2010

**FY2010 Budget Proposal
Squaxin Island Tribe**

Salaries

Fish Bio .20 FTE	10,812
Resource Tech 1 .5FTE(2 .25FTE)	15,850
Resource Tech 1 .40FTE (2 .2FTE)	11,718
Salaries Total:	38,379

Fringe @ 41% 15,735

Supplies: 1,077

Vehicle Maintenance: 500

Grand Total: 55,692

REFERENCES

- Baranski, C. 1989. Coho smolt production in ten Puget Sound streams. Wash. Dept. Fish. Tech. Rept. No. 99. 29p.
- Lenzi, J. 1983. Coho smolt enumeration on several small Puget Sound streams. 1978-1981. Wash. Dept. Fish. Prog. Rept. No. 199. 92 p.
- Lenzi, J. 1985. Coho smolt enumeration on several small Puget Sound streams. 1982-1984. Wash. Dept. Fish. Prog. Rept. No. 232. 61 p.