

**Pacific Salmon Commission, Northern Fund Final Report**

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**Southeast Alaska Commercial Chinook Port Sampling  
– Final Report for Northern Fund, COOP-17-007; NF-  
2016-I-61**

**By**

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**and**

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July 2017

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Alaska Department of Fish and Game

Division of Commercial Fisheries





***PACIFIC SALMON COMMISSION, NORTHERN FUND FINAL  
REPORT***

**SOUTHEAST ALASKA COMMERCIAL CHINOOK PORT SAMPLING**

**(COOP-17-007; NF-2016-I-61)**

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## **ABSTRACT**

Changes in the Pacific Northwest tagging programs have increased the presence of adipose fin clipped Chinook salmon in Southeast Alaska (SEAK) fisheries that do not contain a coded wire tag (CWT) in the head (No Tags): 75% during the summer troll fisheries in 2016. The increased number of mass marked (MM) heads recovered in visual sampling programs can overwhelm the capacity of head dissection labs and delay processing and reporting of results. Although most SEAK Commercial Fisheries port samplers are using electronic tag detection wands to determine if a tag is actually present in the head of adipose fin clipped fish; the clip rate is so high that it requires two samplers per sampling event to be efficient and obtain good quality data. In addition, State of Alaska funding for the SEAK Commercial Fisheries Port Sampling program was reduced by 20-25% in 2015 and 2016.

In an effort to maintain or increase CWT sample rates, this project will fund commercial port sampling technicians in seven Southeast Alaska ports of call and on tenders or buying stations to examine Chinook salmon harvested in the Southeast Alaska troll fisheries to determine if valid CWTs are present.

Key words: Chinook salmon, *Oncorhynchus tshawytscha*, matched biological sampling, coded wire tag, coded wire tag (CWT), double index tag (DIT), mass marking (mm), no tags, port sampling, Southeast Alaska, troll, gillnet.

## **INTRODUCTION**

The Alaska Department of Fish and Game (ADFG) Southeast Alaska management area includes waters from Cape Suckling south to Dixon Entrance. Salmon are commercially harvested in Southeast Alaska (SEAK) with purse seines, drift gillnets, set gillnets and hand and power troll. Chinook salmon are harvested in all these commercial fisheries. These fisheries harvest mixed stocks of Chinook salmon, including those originating from Alaska, British Columbia, and the Pacific Northwest. Significant numbers of both hatchery and wild stock Chinook salmon have coded-wire-tags (CWTs) inserted into their heads. These fish are marked externally by removal of the adipose fin. Sampling programs recover CWTs with the objective to sample a minimum proportion of fishery catches and escapements. Analyses of CWT data provide estimates of fishery exploitation rates and other statistics employed for stock/fishery assessments and planning. The Pacific Salmon Commission (PSC) technical committees rely upon selected groups of CWT' d hatchery and wild Chinook and coho as surrogates to estimate impacts on natural stocks.

The CWT data set is one of the most important information sources for implementation of the Treaty. The collection, timely transfer, and reliability of these data are fundamental to stock management and assessment for Chinook salmon. ADF&G's CWT recovery effort and the associated database is part of a cooperative coast-wide coded wire tagging program that is coordinated by the Pacific Salmon Commission (PSC). Coded-wire tags are recovered from Chinook salmon caught in Transboundary River and SEAK fisheries and decoded at the ADF&G Mark Tag and Age (MTA) lab to determine age and origin (hatchery or wild). Each day CWT recovery data are combined with release and catch /sample data in an online relational database and used to generate estimates of hatchery contribution, quantify survival of hatchery-reared salmon, and determine the timing of runs through commercial fisheries. These data allow biologists to manage fisheries in real time and ensure compliance with U.S. – Canada Pacific Salmon Treaty agreements involving resource allocation and management of transboundary

stocks. The agreements assure that at least 20% of commercially caught Chinook salmon will be sampled for the presence of CWTs.

High numbers of Chinook salmon caught in SEAK fisheries are adipose fin clipped but do not contain a CWT (No Tags). Recently, the Pacific Northwest has moved towards mass-marking their Chinook salmon smolt with an increase of annual hatchery smolt production. For three decades, Alaska Department of Fish and Game (ADF&G) commercial fisheries port samplers have utilized visual sampling of adipose clipped fish to recover CWTs. The escalating presence of No Tags in SEAK fisheries has impacted CWT sample rates. Most SEAK Commercial Fisheries Port Samplers are using electronic tag detection wands to determine if a tag is present in the adipose fin clipped fish. Even with the use of tag detection wands the No Tag rate is so high that it requires two samplers per sampling event to be efficient at examining adipose clipped Chinook salmon. During the summer troll fisheries in 2016, the presence of No Tags exceeded 70% of the adipose-clipped fish sampled. These high numbers of adipose clipped fish, with and without a CWT, make efficient sampling for CWT difficult without multiple samplers.

## **OBJECTIVE**

The objectives of this project addresses Goal 1 of the Northern Fund: “Development of improved information for resource management, including better stock assessment, data acquisition and improved understanding of limiting factors affecting salmon production in the freshwater and marine environments.” Specific objectives include:

1. Landings of Chinook salmon from troll, drift gillnet and purse seine fisheries will be visually sampled for CWT’s at the coast wide standard of 20% or above. After visual determination of a missing adipose fin, an electronic tag detection wand will be used to scan the fish’s head for the presence of a CWT. If the fish positively signals, the head is recovered and decoded by ADF&G staff at the Mark, Tag and Age Lab.
2. During each of the Southeast Alaska troll fishing periods Chinook salmon with an intact adipose fin will be examined for the presence of a Double Index Tag (DIT) at a rate of 1 in 5. A fish with an adipose fin will be chosen and scanned with a tag detection wand. If the fish positively signals, the head is recovered and sent to the ADF&G Mark, Tag and Age Lab for decoding.

## **METHODS**

Chinook salmon Genetic Stock Identification (GSI), CWT and DIT sampling procedures and objectives were produced and made available to ADF&G port sampling staff in Southeast Alaska prior to the project start date of July 1, 2016. Whatman genetic cards were assembled and distributed to all ports collecting GSI samples from troll and select drift gillnet caught Chinook salmon. Technicians were trained to properly utilize electronic tag detection wands and each port was given enough wands for effective sampling. When needed, an extra technician was added to sample a troll offload containing Chinook salmon to maintain the expected sampling rates for CWT, DIT and GSI.

ADF&G commercial port samplers were stationed onboard tenders buying fish on the fishing grounds and in port during dockside deliveries in Ketchikan, Craig, Petersburg, Wrangell, Sitka, Pelican, Hoonah and Juneau. Port samplers obtained fishing information from vessels insuring fish were within the same quadrant before sampling. When collecting biological data, 1 in 10



fish delivered were sampled to ensure representative sampling. From these fish a scale, axillary fin clip and a measurement (nearest 5mm mid-eye to fork) were collected. Approximately 0.5-1 inch of the axillary process or “spine” located above the pelvic fin was collected for DNA using clippers. Each axillary process was placed on a uniquely numbered Whatman card and preserved with non-ionized salt before being pressed between desiccant packs to quickly dry and preserve the tissue. The Whatman number was recorded on an ASL form, corresponding to the length and the scale card. The Whatman card number was entered into the ADF&G Region database by technicians working in the Douglas Scale Aging Laboratory on a weekly basis. The DNA tissue samples were processed and analyzed by the ADF&G Gene Conservation Laboratory in Anchorage, AK.

Chinook salmon were visually examined for the presence or absence of an axillary fin indicating a CWT during or after an offload. If a Chinook salmon missing an adipose fin was encountered, the head of the fish was examined using an electronic tag detection wand. If the fish “signaled”, indicating a tag was present, the head was collected for future tag extraction. Chinook salmon with intact adipose fins were selected and wanded for the presence of a DIT at an attempted sampling rate of 1 in 5. If the fish signaled, the head was tagged, recovered, and shipped with CWT heads for tag extraction and decoding at the Mark Tag and Age Lab in Juneau, AK.

## **RESULTS**

All tissue samples from 2016 and through the spring fisheries of 2017 have been forwarded to the Gene Conservation Laboratory. All scale samples and corresponding data were sent to the ADF&G Scale Lab on a weekly basis and all samples have been received. Technicians collected over 6,000 GSI samples from Chinook salmon harvested in the troll and select gillnet fisheries during this reporting period (Tables 1 and 2). The spring troll fishery in 2017 was closed for all districts outside terminal harvest areas on May 28<sup>th</sup> due to low returns of Alaska hatchery Chinook salmon and wild stock concerns. Select fishery areas were opened again on June 15<sup>th</sup> for limited fishing time, some areas with modified boundaries. GSI samples were collected to be representative of the harvest and sampling goals were met when enough fish were delivered.

During this reporting period the SEAK port sampling program was able to maintain and exceed the CWT sampling rate during most statistical weeks and districts for troll, gillnet and purse seine with the No Tag rate ranging from 27-67% (Table 3). Over 100,000 Chinook salmon were sampled for CWT and port samplers recovered 126 DIT’d Chinook salmon from the troll fishery with an average sampling rate of 6%.

## **DISCUSSION**

Mark-selective fisheries have more than doubled in number since 2007, with new areas and stocks fished under mark-selective regulations. A double index tag (DIT) group is needed for each PSC indicator stock in order to evaluate the impacts of MSFs on each natural-origin stock represented by an indicator stock. A double-index tag (DIT) group includes two related coded-wire tag (CWT) groups, one clipped and one unclipped. For DIT-based estimates of fishery impacts on natural-origin stocks to be unbiased, both marked and unmarked fish must be sampled for CWTs in all fisheries and in escapements where DIT groups are expected to be encountered. ADF&G in SEAK has relied on visual sampling of adipose fin clipped fish to recover CWTs for over three decades and has provided high-quality data for regional and Pacific Salmon Commission (PSC) analytical and management purposes. The increasing numbers of adipose clipped Chinook has decreased the CWT sampling and recovery rate of Chinook salmon

in Southeast Alaska ports due to the increase in sampling time. Chinook salmon CWT sampling is most efficient with at least two samplers. One sampler used electronic tag detection wand on all adipose clipped Chinook salmon observed, and adipose intact Chinook salmon at a rate representative of the landed catch and one to count fish in the landing, look for adipose fin clips and/or collect associated biological data. With the large amount of Chinook salmon containing “No Tags” that are still adipose clipped, the addition of a sampler for each sampling event increased the ability to meet and exceed sampling rates.

During this period over 100,000 Chinook salmon were observed for the presence of the adipose fin denoting the possible CWT implanted in the head. Approximately 18,300 of these fish did not have their adipose fin and 8,000 of those did not actually have a coded-wire-tag. Even with the increasing No Tag rates, port samplers were able to maintain and exceed the coast-wide sampling rate of 20%. Sampling for DIT from the troll fishery was added to an already full sampling load and port samplers excelled and sampled an average of 6% of all the fish encountered for sampling.

**Table 1.**–Matched Chinook salmon GSI and scale sampling objectives and samples collected by troll fishery and quadrant from the 2016 and 2017 troll fisheries in SEAK.

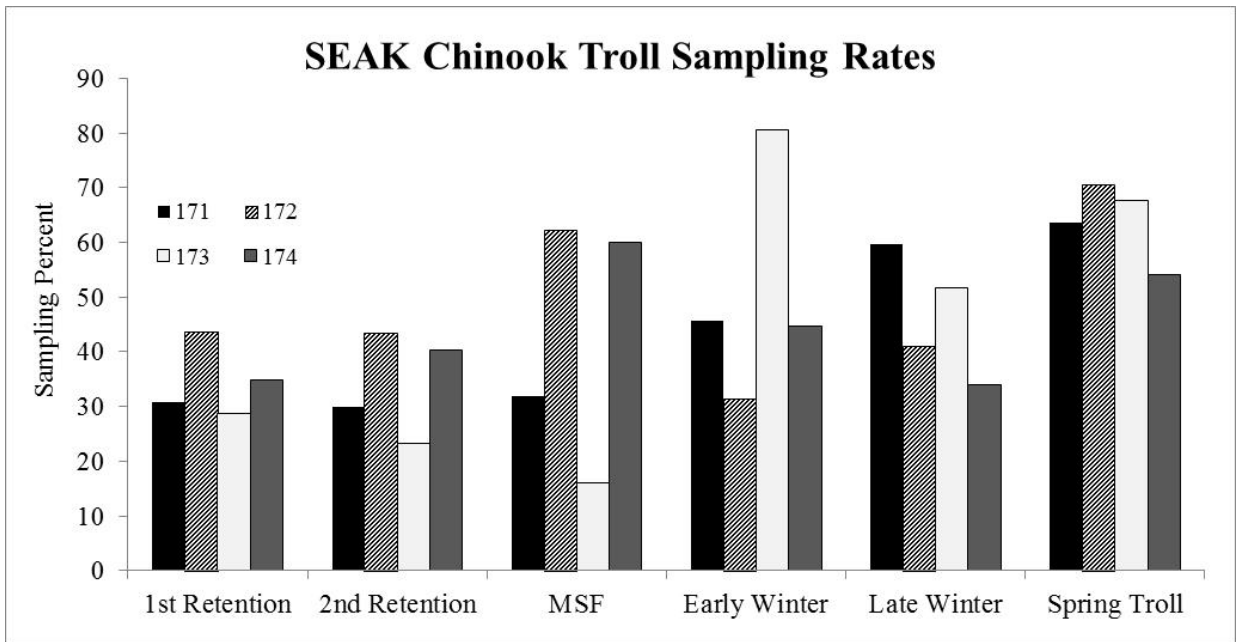
Fishery	Quadrant	Sampling Objectives	Samples Collected
Summer 1 <sup>st</sup> Retention 2016 (July 1 <sup>st</sup> -July 5 <sup>th</sup> )	171	740	730
	172	500	558
	173	350	259
	174	230	163
Summer 2 <sup>nd</sup> Retention 2016 (August 13 <sup>th</sup> -September 3 <sup>rd</sup> )	171	740	783
	172	350	468
	173	300	199
	174	320	182
Mark Select Fishery 2016 (September 4 <sup>th</sup> -September 30 <sup>th</sup> )	171	-	76
	172	-	34
	173	-	4
	174	-	3
Early Winter 2016 (October 11 <sup>th</sup> -December 31 <sup>st</sup> )	171	450-500	469
	172	50	10
	173	30-55	34
	174	60-70	43
Late Winter 2017 (January 1 <sup>st</sup> -April 30 <sup>th</sup> )	171	380	388
	172	50	85
	173	30-220	61
	174	80-270	211
Spring 2017 (May 1 <sup>st</sup> -May 28 <sup>th</sup> , June 15 <sup>th</sup> -June 30 <sup>th</sup> )	171	300-500	528
	172	100	103
	173	0-600	151
	174	200-600	374

**Table 2.**—Matched scale and GSI samples collected by port from Chinook salmon harvested in the directed gillnet fishery from July and August, 2016.

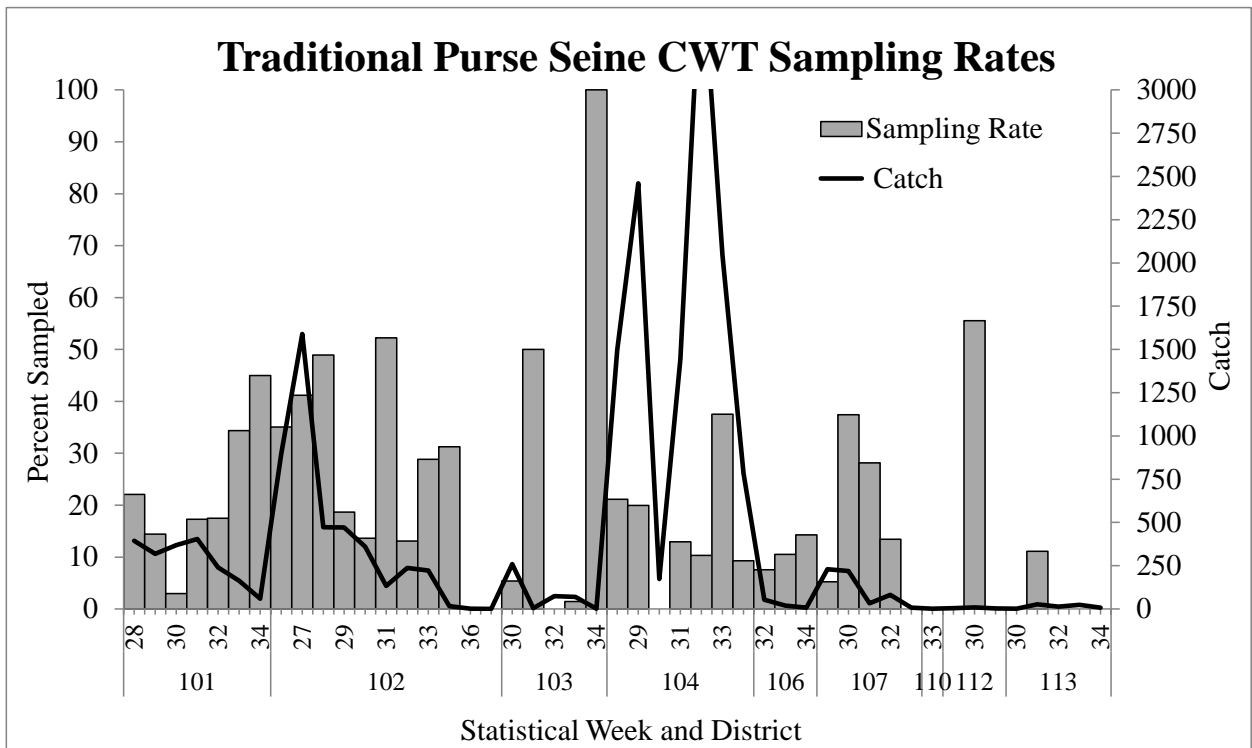
Port Collected	District	
	108	111
Juneau	-	20
Petersburg	40	-
Wrangell	125	-
Total	165	20

**Table 3.**—Chinook salmon sampled for CWT and DIT in the troll fishery from July 1st 2016–June 30<sup>th</sup> 2017 in the troll, drift gillnet and purse seine fisheries.

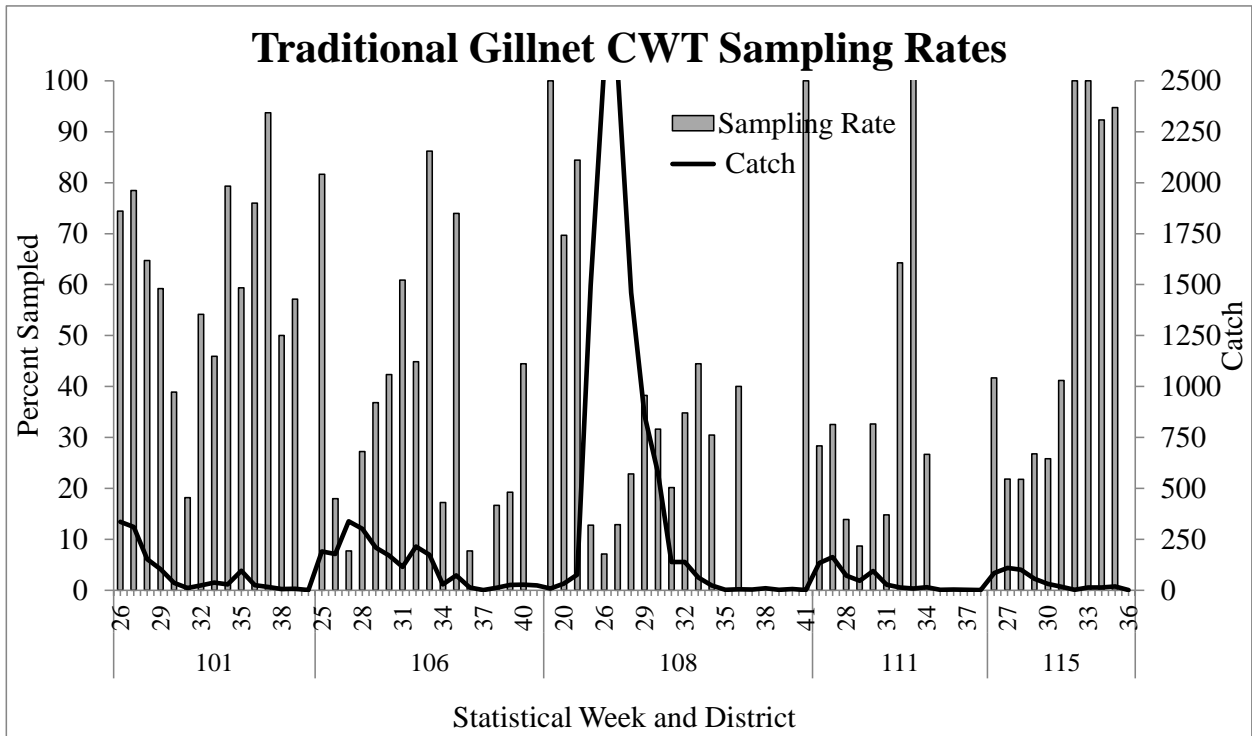
Fishery	Chinook Sampled	Clips Observed	% No Tags	Sampled for DIT	DIT Recoveries	DIT Sampling Rate
Summer 1st Retention 2016 (July 1st-July 5th)	35,266	7,297	27%	4,111	52	4%
Summer 2nd Retention 2016 (August 13th-September 3rd)	24,065	4,645	67%	3,634	45	5%
Mark Select Fishery (September 4th-September 30th)	159	162	48%	-	-	-
Early Winter (October 11th-December 31st)	3,049	562	48%	502	2	2%
Late Winter 2017 (January 1st-April 30th)	19,528	2,811	46%	3,311	21	9%
Spring 2017 (May 1 <sup>st</sup> -May 28 <sup>th</sup> , June 15 <sup>th</sup> -June 30 <sup>th</sup> )	17,111	1,309	41%	1,794	6	11%
Drift Gillnet 2016	3,742	379	31%	-	-	-
Purse Seine 2016	4,224	1,188	63%	-	-	-



**Figure 1.**—CWT sampling rates for Troll caught Chinook salmon in the traditional, spring and mark select fishery by quadrant for the reporting period 1 July, 2016–30 June, 2017.



**Figure 2.**—Traditional purse seine CWT sampling rates and catch by statistical week and district for 2016.



**Figure 3.**—Traditional drift gillnet CWT sampling rates and catch by statistical week and district for 2016.

### BUDGET SUMMARY

The budget allocation for this project was as follows:

Salary for ADF&G port sampling personnel:	\$103,568
Travel; to/from Juneau, Ketchikan, Petersburg, Wrangell	\$
Contractual; pay to tenders for onboard samplers, cell phone charges, shipping, etc.	\$
Supplies; vials, forms, tags, gloves, etc.	\$
Subtotal Direct	\$103,568
<u>ADF&amp;G Overhead: \$103,568 x 21%</u>	<u>\$21,750</u>
<b>TOTAL</b>	<b>\$125,318</b>

Total direct project expenditures by Alaska Fish and Game have not been calculated at the time of this report. All project expenditures by Alaska Fish and Game were for personnel, travel, contractual and commodities related to matched sample collection in Ketchikan, Petersburg, Wrangell, and Juneau as well as project supervision from Juneau. ADF&G personnel coded to this project included: 1) Randy Peterson and John Barton; Juneau Biometrician and MTA lab 2) Vena Stough, Kathleen Hagen, Kacie Rear, Olga Thomas, and Clare Jurczak; Sitka port sampling 3) Matthew Standley; Ketchikan port sampling, 4) Jazmine Alibozek; Craig port sampling , 5) Ruth Doubek; Pelican port sampling.