

## **Klamath Basin Coho Salmon Fishery Management**

### **CA Dept. of Fish and Wildlife**

#### **Briefing for Pacific Fisheries Management Council (SONCC Coho Technical team)**

#### **Introduction**

The Southern Oregon- Northern California Coastal (SONCC) ESU is listed as “threatened” under both federal and state ESA statutes. The federal listing occurred in 1997 and the state listing occurred in 2005. Non-tribal take of Coho salmon has been prohibited in both California marine and in-river fisheries since 1996. Klamath basin Coho salmon management has been focused on recovery actions in the years following the fishery closures. Recovery actions include population monitoring, hatchery management and habitat restoration. SONCC Coho salmon are currently not allocated to California fisheries through the Pacific Fisheries Management Council (PFMC) process.

Based on the Hatchery Scientific Review Group (HSRG) designations, most Coho populations in the basin are in the “preservation” or “recolonization” phase. The strongest Independent Coho sub- population in the basin is the is found in the Scott River, while many of the other sub areas (both independent and Dependent populations) have extremely low or unknown numbers. Hatchery production continues to be a major component of basin Coho populations, particularly within the Trinity River.

#### **Adult Coho Population Monitoring**

The CA Department of Fish and Wildlife (Department) is responsible for monitoring a number of escapement and harvest sectors within the Klamath Basin. Additionally, federal and tribal partners also partake in monitoring areas of the basin. Much of the Coho monitoring is ancillary to Fall Chinook salmon monitoring and therefore is not as robust in terms of survey protocols, length of survey and data collection. Additionally, stream conditions (high flow, turbidity, etc.) can limit monitoring efforts in the late fall/early winter when Coho populations are actively spawning. Relatively robust data exist for many areas since 1977. A variety of methods are used to monitor Coho abundance including fisherperson surveys, video and marking weirs, walk and dive surveys (carcass recovery and redd enumeration) and direct counts of Coho entering the basin hatcheries (Figure 1). The Department, as lead or cooperator, currently monitors Coho abundance in the following locations and using indicated methods:

1. Basin hatcheries – Direct count of all fish entering the facilities
2. Scott and Shasta Rivers and Bogus Creek – Video weir counts, spawner surveys below video sites.
3. Salmon River – redd estimates
4. Upper Klamath River miscellaneous tributaries- redd survey
5. Trinity River – Marking weir used to estimate abundance upstream of Willow Creek on the Trinity River.
6. Lower Klamath River- Sportfishing creel survey
7. Upper Trinity River – Sportfishing tag return survey

Tribal fisheries are monitored by the Yurok (lower Klamath River) and Hoopa (Lower Trinity River) respectively. Additionally, selected tributaries in the Upper Klamath Coho Population unit (Portuguese Creek upstream to Iron Gate Dam) are monitored by the Karuk Tribe and the Mid Klamath Watershed Council.

A 100% marking strategy at basin hatcheries has been employed since brood year 1994. Maxillary clips have been used to identify fish of hatchery origin, right maxillary clips at Trinity River Hatchery (TRH) and left maxillary clips at Iron Gate Hatchery (IGH). Where possible, the origin of Coho (hatchery or wild) is identified in all monitored sectors of the basin. Biological data, including length, sex, fin clips, tags, spawning success, etc. is opportunistically collected when fish can be examined in hand. Coho observed from video counts are examined for maxillary clips and assigned a general designation as jacks or adults based on relative size. Age determinations (Coho cohorts) are based on fork length frequency analyses or a set visual cut-off size i.e. 55 centimeters. There is not a similar scale-based age structure analyses of annual Coho run size as is the case for fall Chinook salmon in the basin.

The Department in recent years has collated basin adult Coho data into an annual table (see attachment). The data comes from a variety of sources including agencies, tribes and NGO's. The data is not peer reviewed in most cases and is accepted as submitted. We are currently requesting 2019 data for inclusion in the table and will make this table available for the tech team.

### **Juvenile Coho Population Monitoring**

The Department and Klamath basin partners also collected juvenile Coho salmon data from a variety of areas throughout the basin. The primary methods of data collection are through the use of rotary screw traps (RST's) or fyke nets, although visual or tagging surveys are sometimes performed for specific studies. The Department operates RST's in the main stem Scott and Shasta Rivers and a fyke net in Bogus Creek. The US Fish and Wildlife Service (FWS) operates or collaborates on RST's in the mainstem Klamath River in several locations and on the mainstem Trinity River. Partners include the basin tribes (Karuk, Yurok, Hoopa).

The data has been used to inform a number of desired biological metrics including emigration timing, hatchery/natural components, smolts per adult indices, incidence of disease, etc. Similar to adult monitoring, the focus of most juvenile trapping in the basin has been for fall Chinook salmon. The exception to this is the Departments efforts in Bogus Creek. This effort targets Coho in that basin to inform the IGH HGMP.

### **Hatchery management**

As mentioned previously, two basin hatcheries exist in the Klamath basin, both at the base of dams that limit upstream migration. Both hatcheries (IGH and TRH) were originally built in the early 1960's as mitigation for lost habitat above the dams and are managed by the Department. Current juvenile Coho production goals are 75,000 fish at IGH and 300,000 fish at TRH. Currently all juveniles are released as yearling type fish in the fall (Oct – Nov.) and all production is released volitionally on site. All Coho production is marked with a right or left maxillary clip (RM, LM) prior to release. Coho at IGH receive a LM and TRH fish are marked with an RM. Historically (1960's and 70's) importations of out-of-basin coho eggs were raised and released into the basin, however this practice has not occurred in decades.

Original production of Coho salmon was for the purpose of mitigating for lost habitat above dams and to supplement tribal and non-tribal fisheries. The listing of Coho salmon as threatened and subsequent hatchery management, as guided by “Hatchery Genetic and Management Plans” (HGMP), has shifted the focus of basin hatchery Coho programs to more conservation minded programs that are integrated with populations in the same population unit. Currently, IGH has an approved HGMP (2018) and TRH has a draft HGMP that is close to finalization and approval by the National Marine Fisheries Service (NMFS) as of this writing. Guidance in the HGMP’s includes best hatchery practices for mating protocols, brood stock collection and integration, juvenile release strategies, integrated population strategies and numerous metrics for evaluating program and population effectiveness including indices such as egg to release survival, emigration rates, PHOS, PNOB, PNI, etc. The IGH HGMP led to implementation of real time brood stock management which is used to minimize the relatedness coefficient of potential spawning pairs. Coho which enter IGH have tissue collected for genetic analyses, are placed in numbered tubes in holding ponds and spawned preferentially according to spawning matrices developed by NMFS.

### **Fisheries Management**

Prior to state and federal ESA listings of Coho salmon as threatened and subsequent harvest prohibitions, in-river sport fisheries for Coho salmon were based on daily bag and possession limits. Coho salmon were not managed separately but combined with Chinook salmon and bag and possession limits and were based on the aggregate of “salmon” allowed for take. Because fall Chinook salmon are allocated (post 1986) by the PFMC based on pre-season ocean abundance levels, annual bag and possession limits are adjusted accordingly i.e. larger quotas resulted in higher daily bag and possession limits and lower quotas resulted in more conservative bag and possession limits. Because Coho salmon were managed in aggregate with fall Chinook salmon, the take of Coho was also subject to bag and possession changes. Harvest of Coho salmon was limited to areas of the main stem Klamath and Trinity Rivers.

Coho salmon spawning escapement thresholds/targets were never established for the Klamath basin and therefore both tribal and recreational fisheries were not constrained by annual harvest quotas or other management targeting escapement thresholds. Estimated sport harvest of Coho salmon was (and still is) estimated based on creel surveys in the lower Klamath and angler tag return data on the Trinity River. Some areas of the basin (upper Klamath River and lower Trinity River) were not monitored for harvest or were only monitored periodically. Additionally, since the main focus of fishery monitoring was to capture fall Chinook salmon harvest information, surveys often ended in early November, particularly in the lower Klamath River.

Based on full sport fishing closures on Coho salmon in 1996, contemporary fisheries harvest monitoring and management is focused primarily on collecting data on Coho harvest that occurs mistakenly by unknowledgeable anglers (due to mis-identification of species or lack of regulatory knowledge). Coho catch and release data is also collected during Department fishery surveys. Supplemental angler effort and catch data is also available from the “North Coast Salmon Report Card”. This card is required by all anglers fishing for salmon in the Klamath basin and Smith River basin. Data from the cards, though available, is considered biased in some regards since return of cards to the Department is less than 35% of the number sold and relies on angler information that is not verified in the field.



Figure 1. Selected monitoring locations and methods for Coho monitoring in the Klamath basin. Note that smaller miscellaneous tributaries to the Klamath River are not shown but do have some redd/carcass surveys associated with them.