

Chinook Salmon Scale Aging the Westward Region

Tyler Polum

Introduction

Kodiak Island has only two native Chinook runs, the Karluk and Ayakulik rivers. The Alaska Peninsula has several Chinook runs but only two, Chignik and Nelson, have escapement goals developed for them. Chinook are an important species in the Westward Region both for sport fishermen and for subsistence users, but are only incidentally caught in commercial fisheries and often have little value to commercial fishermen in this region. Since 2000, the Karluk has seen very low returns of Chinook with the Ayakulik, Chignik and Nelson having a similar trend more recently.

Sportfish staff have been responsible for aging all Chinook scales in the westward region for the recent history. Recent Chinook sampling projects have been funded by Sportfish Division (SF) on the Karluk, Ayakulik and Chignik rivers, with the majority of the effort focused on the Karluk and Ayakulik. These projects were left unfunded in 2011 and Commercial Fisheries (CF) staff voluntarily continued collection of ASL data at the weirs in these three locations, with data being transferred to SF post-season and SF staff aging the scales.

Several new sampling efforts are beginning in 2014 with regards to Chinook for both CF and SF in the Westward Region. SF staff will begin sampling Chinook caught in the marine waters sport fishery on Kodiak Island and CF staff will continue sampling Chinook at the Karluk, Ayakulik and Chignik weirs. They will also sample commercially caught Chinook from Kodiak Island.

Recently, one SF biologist has been responsible for all of the Chinook scale aging in the Westward Region. However, this was typically no more than 300 fish from three different systems. In general, SF and CF staff collaborate on scale aging processes and protocols for any species or system. For the most part it is informal with just general communication of techniques and challenges, but all scale agers take the same test and are trained the same in the Westward Region, both CF and SF.

Scale Test

Every year a scale agers test is developed by salmon and herring research biologists in Kodiak and administered to all potential agers. Potential agers must work through previous scale tests as assigned and review the document ‘Salmon Scales: A Guide to Aging and Identification’ before taking the test. Also, they must receive the permission of the research biologist in charge of the test to take it after they have proven to possess the knowledge needed or the test.

All scale aging in the westward region is conducted using the techniques outlined in *Identification of Pacific salmon and steelhead trout by scale characteristics* by Mosher in 1969.

This paper is the standard reference in operational plans and reports regarding salmon scale aging.

Chinook Scale Aging

Chinook scales are aged with the same basic, proven techniques as other species in the region and across the state. For Chinook, four scales per fish are collected and technicians are trained to take extra care with Chinook scales as we often see high rates of re-absorption and regeneration. Scales are sent back to the Kodiak office at all available opportunities to reduce the chance of losing data.

Historically, age 1.3 and 1.4 fish were the dominate age classes in the Karluk and Ayakulik rivers. Little variation was seen in the age composition. More recently, age 2 freshwater fish have become more common. This is something that will be looked at and evaluated to try to determine possible causes or explanations. It could be a difference of who is aging the scales or a shift in the life history of these fish concurrent with depressed returns of adults.

In any case, the freshwater portion scales from Westward Region Chinook are often very small and it can be hard to determine freshwater age. Fish from both systems often exhibit large areas of plus growth as well, possibly due to large lagoons available for rearing of Chinook smolt, particularly on the Karluk. Great care and attention to detail is used to differentiate a second freshwater check and plus growth. It is also not uncommon to see high rates of regeneration in the freshwater portion of the scale. Even though four scales are collected, it is not uncommon for all four scales to be regenerated in the early part of the fish's life. These areas of regeneration are not always obvious during sampling as well and sampling methods may be changed to incorporate UV light or other techniques that might help identify un-readable scales in the field.

The saltwater portions of these scales are often display more defined checks, but have high rates of re-absorption. This has become more prevalent in recent years as run-timing has been approximately two weeks later than historical run-timing. Also, warmer, drier summers have persisted with low-water conditions inhibiting fish passage. One other characteristic of note is that winter checks can be difficult to distinguish due to high rates of growth in the winter. Some fish have checks that are masked by 'summer' growth where either the fish was able to grow at near summer like rates in the winter or the winter growth was highly abbreviated.

Conclusions

While Chinook are a valuable species to the Westward Region, they are not very numerous and sampling opportunities have been limited in the past. They are often overshadowed by the large sockeye, pink and coho runs on Kodiak and the Alaska Peninsula.

Formal Chinook scale aging protocols have not been developed, however, both CF and SF staff would like to develop a guide for the Westward Region or see a statewide scale aging standard established. Stock specific knowledge is still required, but techniques or protocols learned from

other areas would gladly be incorporated into current aging practices as well as future sampling efforts set to begin in 2014.