

Fall Chinook¹

COMMON NAMES²: King salmon, tye salmon, Columbia River salmon, black salmon, chub salmon, winter salmon, and blackmouth.

DESCRIPTION: Chinook are anadromous fish (they are born in freshwater streams, migrate out to the ocean and return to fresh water as mature adults to spawn). In the ocean, they are greenish blue to black on their backs, with white bellies. Chinook have irregular black spots on their backs, dorsal fin, and tail fins, and black coloration in their mouths, hence the name blackmouth salmon. In freshwater, maturing fish are very dark, almost black in coloration. Chinook salmon can weigh over 100 pounds and achieve 58 inches in length. An average Chinook salmon weighs about 20-25 pounds.

LIFECYCLE: Populations of Chinook, called runs, are grouped by the time they return to the rivers to begin their final spawning journey: spring, summer, fall, and winter. Though Chinook salmon can be found entering spawning rivers throughout the year, the majority return from April to December. Spawning and rearing times are dependent on timing of the individual runs. Because of their large body size, Chinook tend to use deeper water and larger gravel size to spawn than other salmon (up to cantaloupe size rocks). The female digs the nest or redd in areas with moderate to high velocity water about a foot deep. Most spawning and rearing activity takes place in the mainstream channels immediately above the saltwater limit or hundreds of miles upstream.

The eggs of the Chinook salmon are larger than any other salmon species. Depending on her size a female can produce 2,000 to 14,000 eggs, averaging about 5,000. Adults die soon after spawning. The young Chinook salmon typically emerge from their gravel nests in three to five months. Research shows that low dissolved oxygen and/or low water temperature increase the length of time the eggs take to develop.

The juvenile salmon grow and feed as they migrate downstream towards the sea, stopping to rear in coastal estuaries for periods up to 5 months, and then migrating to the open ocean. Most juvenile Chinook salmon from the southern parts of the Pacific Northwest enter the ocean during their first year of life. Most juvenile Chinook salmon from the northern parts of the Pacific Northwest (Alaska) enter the ocean during their second year of life. Chinook salmon can mature and return to spawn in as little as one year or as long as nine.

The Chinook salmon is an opportunistic and carnivorous feeder throughout its life, primarily feeding on insects, crustaceans, invertebrates, and other fish.

RANGE: As far south as southern California, and as far north as Arctic Canada.

HABITAT AND ECOLOGY: From April through November of every year juvenile Chinook salmon inhabit the estuaries and inter-tidal areas of the Pacific Coast. These estuarine areas with

¹ SCIENTIFIC NAME: *Oncorhynchus tshawytscha*, from the Greek roots *onkos* (hook), *rynchos* (nose), and *tshawytscha* the common name for Chinook in Kamchatka.

² Taken from ANADROMOUS FISH OF THE PACIFIC NORTHWEST prepared by the Pacific States Marine Fisheries Commission.

fresh and salt water wetlands and vegetation provide habitats that are crucial to survival. Not only do they provide habitat for the young salmon, they provide the food in which the Chinook prey on: crustaceans; insects; and other fish. Healthy estuaries with adequate food are essential to the juvenile salmon's transition from fresh water to salt water.

Large logs in the stream are important habitat for juvenile Chinook salmon. Large wood helps form deep, slow flowing pools and off-channel alcoves. These different types of habitat provide cover from predators, protection from the sun, and feeding areas for the young Chinook on their journey. Stream-bank vegetation plays a key role in providing the needed habitat for juvenile Chinook salmon to survive.

Good water quality is also important to the young salmon. Siltation from improper land use practices, excessive high or low water temperature, and loss of stream cover or canopy all have negative impacts on Chinook survival.

Pollution and logging practices can alter stream flow and lower oxygen levels, making the water inhospitable or unfavorable to juvenile salmon. Man-made dams with large reservoirs flood the much needed shallow main-stream channel areas utilized by both the juvenile and adult Chinook salmon for spawning and rearing. Healthy watersheds and fish-friendly forest practices are very important to the Chinook salmon survival.

ECONOMIC VALUE: U.S. commercial landings of Chinook salmon have averaged 22,756,000 pounds from 1989-1993. The Chinook salmon is an important subsistence fish to Native Americans. It is also a highly prized recreational fish in the Pacific Northwest. People often travel thousands of miles to catch a big Chinook salmon.

Fall Chinook in the Nehalem River

Most observed fall Chinook spawning occurs in and below Humbug Creek (River Mile 35)³. Data layers based on ODFW staff judgments and published by Streamnet show approximately 82 miles of Chinook spawning habitat. Seventy five percent of this habitat is in the Lower Nehalem basin. Jody White and Brian Riggers estimate that there are 121 miles of high quality Chinook spawning habitat in the Nehalem.²

Typically the returning Fall Chinook will remain in the Nehalem estuary until fall rains raise river levels and cool the water. Spawning peaks in November.

The assessment of the run size from 1950 to present has been by surveys of "standardized" spawning reaches. These counts of live and dead Chinook are used to generate a spawner density index (peak fish/mile).

Between 1955 and 1975 Standard Chinook surveys in the Nehalem Basin were conducted in Soapstone Creek (.7 miles), Cronin Creek (1 mile) and East Humbug Creek (1 mile). During this period peak adult Chinook counts averaged about 20 fish per mile. Surveys were discontinued in the mid 70s and then resumed again in the mid 80s. Counts for the same streams between 1985 and the present averaged about 40 fish per mile. (see figure 3)

³ Adapted from Chinook Salmon funding proposal , Nehalem River Escapement Indicator Stock Monitoring Project , Jody White and Brian Riggers



Fig 1 Fall Chinook Habitat⁴

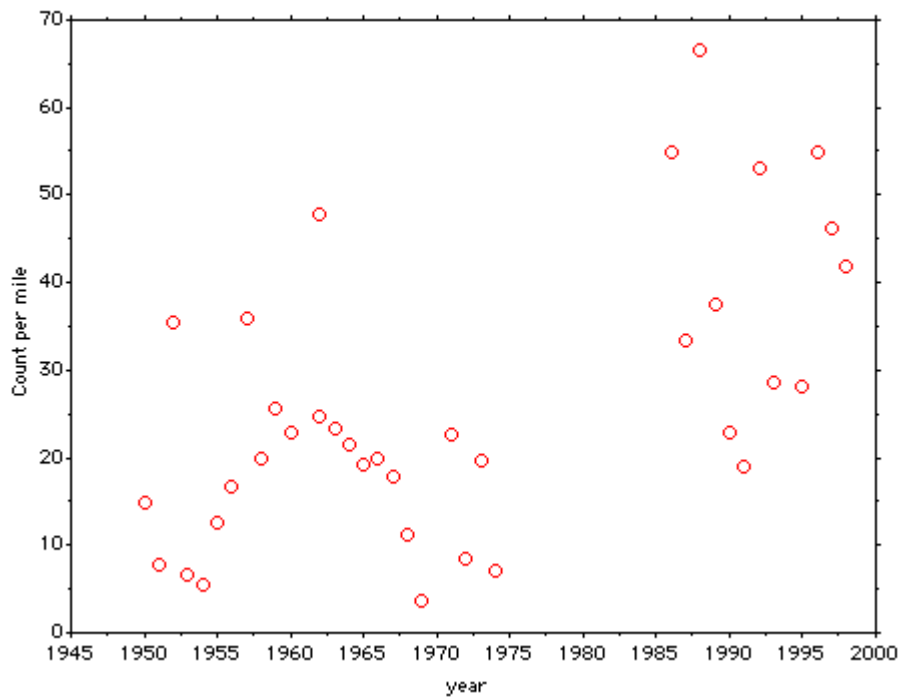


Figure 3 Peak Fall Chinook Counts 1955 – 1999

⁴ ODFW staff judgments

The increase in Chinook counts is probably, at least partially, due to the elimination of freshwater commercial harvest of Chinook in the early 1950's. Freshwater recreational harvest has continued and is currently estimated to be around 2,000 per year.

Figure 4 provides a comparison of the average Nehalem Basin counts per mile (5 stream reaches⁵) with that of other coast basins from 1985 to 1998.

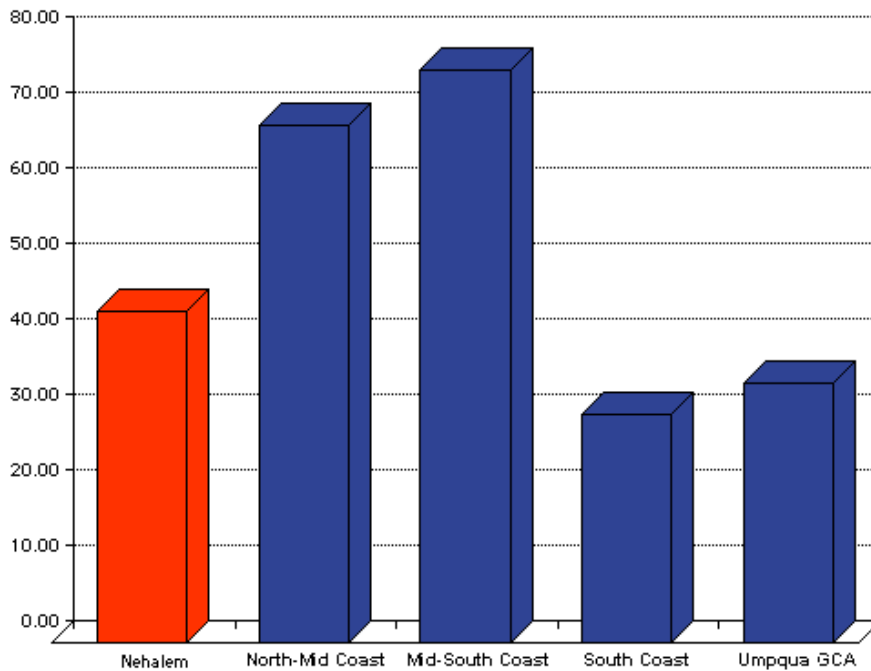


Figure 4 Peak Fall Chinook counts for the Oregon coast

The ODFW objective for Nehalem Fall Chinook is 47-105 per mile. This would result in 7,400 to 16,700 adult spawners per year.

Research has shown that hatchery fish can compete with wild fish for food, spread disease, and interbreed with wild fish to produce less resilient fish⁶. This does not appear to be a significant factor affecting Nehalem Chinook runs since the Nehalem River Chinook stock has had minimal hatchery influence.

⁵ Two additional stream reaches, Cook Creek (1 mile) and the Salmonberry river (.5 Mile) were added to the Chinook standard streams in 1985.

⁶ (Salmon Nation The Problem with Hatcheries by Jim Lichatowich and Seth Zuckerman)