

Coho Salmon¹

BACKGROUND²

COMMON NAMES: Silver salmon, Coho, blue back, silversides, and jack salmon.

DESCRIPTION: In the ocean the Coho is metallic blue on its back with silvery sides and white bellies. The Coho salmon is recognizable by the large black spots on its upper back and top half of its tail. Unlike Chinook salmon, Coho do not have black gums along the bases of their teeth. In freshwater, mature Coho have red sides with a green back and head. An average Coho weighs 6 to 12 pounds and is about 24 inches in length.

LIFECYCLE: Adult Coho salmon can be found migrating to their natal (birth) streams from June through February and spawning from September through March. Coho generally spawn in the tributaries and headwater streams of large rivers, preferably in areas with low water velocity and small-sized gravel. The female digs from one to four redds (nests) and generally spawns with different males in each redd, producing a total of 1,000 to 5,000 eggs. Coho die soon after spawning. The eggs hatch in about one month, and the juvenile coho emerge from the gravel in about 2-5 weeks. The young coho usually remain in freshwater for one year, moving in and out of side-channels, sloughs, beaver ponds, and tributary streams, seeking food and shelter from the high winter currents.

Though they may begin their migration down-stream from April through August, most will migrate downstream approximately one year from emerging from the gravel. The juvenile coho will generally spend 2 days to one month in the estuary, feeding and adapting to salt water before entering the open ocean.

Coho generally spend two years in the ocean, returning to their birth streams to spawn in their third year of life. A small percentage of the Coho, usually less than 5% of the population, will return early after only one year in the ocean and are known as jack salmon.

HABITAT AND ECOLOGY: The Coho salmon is a carnivorous and opportunistic feeder throughout its life, feeding primarily on insects, invertebrates, and crustacea when young, and feeding on other fish and squid when in the Open Ocean.

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

² Adapted from ANADROMOUS FISH OF THE PACIFIC NORTHWEST by the Pacific States Marine Fisheries Commission

During their time in fresh water streams, young Coho need the habitat and protection created by downed trees and other vegetation. Large trees and brush in the stream provides the young fish hiding places where they can avoid predators. Behind these trees and obstructions, the scouring of the water, areas that also provide important Coho habitat, creates pool areas.

To survive during the winter, juvenile Coho need to find shelter to avoid being swept downstream in the high currents. Coho escape to slow flowing backwater areas, side-channels, beaver ponds, and wetlands. But man-made habitat alterations, like road building, logging too close to streams, and canalization, have cut back these critically important areas that Coho need to survive. Scientists think that one of the most important factors limiting the survival of Coho is the lack of suitable winter habitat.

The summer months in fresh water can also be critical to juvenile Coho. When water is diverted from streams for other uses, flows decrease, causing the remaining water to warm up and lose its normally high oxygen content -- factors often fatal to the young fish. The lack of trees along streams can also cause water temperature to warm up to unsuitable levels.

Ocean conditions also play an important role in the survival of Coho salmon. When conditions are normal, winds blow from the north during the summer, causing upwelling along the coast. Upwelling is a current that forces cold nutrient rich water from the depths to the ocean surface. Because of the nutrients, microscopic plants called phytoplankton start multiplying. These plants are eaten by the zooplankton (tiny animals) that in turn feed larger animals, which in turn are eaten by the salmon. During climate conditions known as "El Nino", wind conditions are changed and upwelling is depressed. This affects ocean temperatures and the amount of food available for salmon and other organisms, reducing Coho survival.

RANGE: Baja, South central California, to the Bering Sea, and southeast Alaska.

ECONOMIC VALUE: The Coho is a good tasting fish and a good fighter, making it a favorite target of recreational ocean salmon fishermen in the Pacific Northwest. It has also been an important fish for commercial fishermen. The U.S. commercial landings of Coho have averaged 48.9 million pounds annually from 1989-93.

HELPING COHO SURVIVE THE WINTER³

Coho populations have fallen drastically in recent times due to multiple factors. The main concerns being habitat loss, hatchery fish competition, over harvesting, and poor ocean conditions. Numbers are so low that Oregon Coast Coho have been listed as an Endangered Species. Historically large commercial and recreational fisheries have been severely cut back or

³ Adapted from the Pacific States Marine Fisheries Commission from information provided by Oregon Department of Fish and Wildlife.

eliminated to help increase the number of adults returning to spawn. In Oregon, Washington, and California the restrictions have had severe economic consequences for coastal communities.

COHO NEED SAFE HAVEN DURING THE WINTER: Research by the Oregon Department of Fish and Wildlife has shown that one factor limiting salmon survival is the lack of appropriate habitat for Coho salmon during the winter. Because this winter habitat is lacking, only 10-20% of the juvenile Coho salmon present in streams at the end of summer make it through the rainy season to smolt (migrate to sea) the next spring. Winter habitat is the area in the stream and surrounding area where young Coho can escape from the strong water currents and floods of the rainy season. Large trees and branches in the stream, log jams, flooded wetlands, side channels & pools, and beaver ponds all can provide refuge. Without such areas, the young salmon get washed downstream and will not survive. By restoring winter habitat, the survival of young Coho salmon can be increased and the corresponding recovery of the adult salmon runs better assured.

GOOD HABITAT IS HARD TO FIND: Many types of human activities, including forestry, agriculture, and urbanization, have altered the availability of winter habitat for fish. In the past, biologists thought that logs in the stream were obstructing fish passage and had logging companies remove them. Now we know that large logs in the stream as well as streamside trees and their overhanging roots and branches are critical for fish survival.

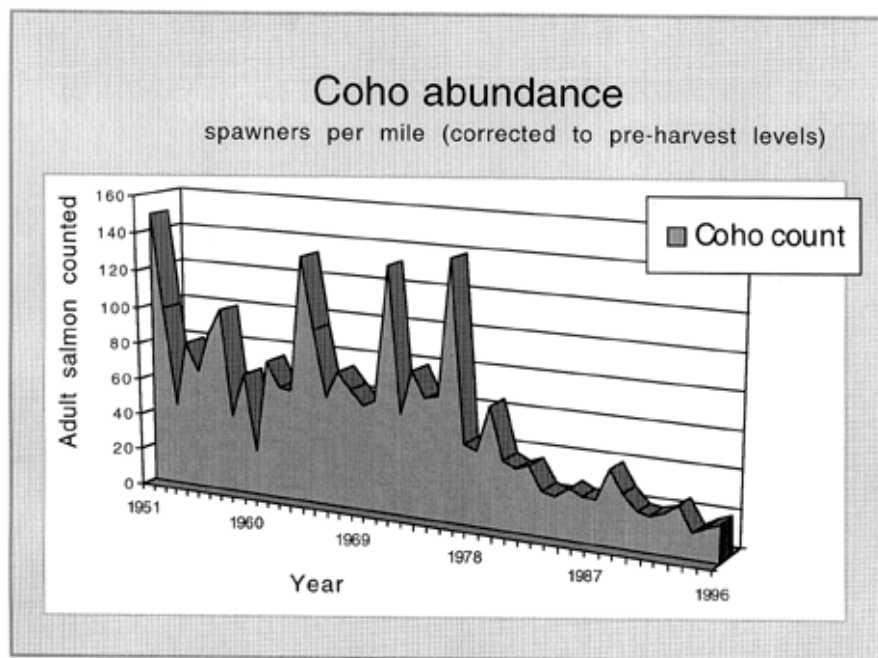


Figure 1

To create pastures and developable land, streams were straightened and rip-rapped (covered by rock to stop erosion), dikes were built; wetlands were ditched and drained, beavers killed, and tide gates

installed. Now we know that the stream meanders, oxbows, side channels, beaver ponds, and flooded wetlands are filled with small Coho seeking refuge during the winter.

As towns and cities grew areas were paved, wetlands filled, run-off channeled into storm drains, and streams straightened and put through culverts. Now we know that these changes have resulted in increased water velocities and the severity of floods. We find too that the culverts have blocked passage of young fish trying to find their way to calmer waters during storms and floods.

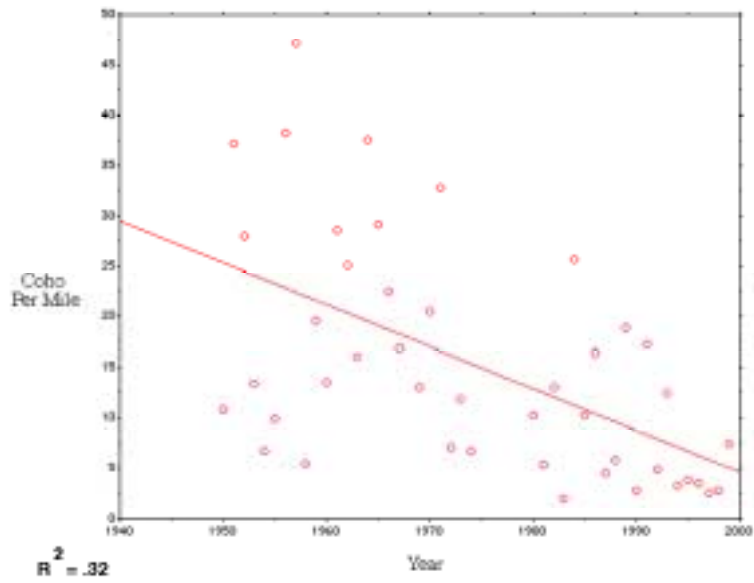
RESTORATION EFFORTS CAN PAY OFF QUICKLY: Fortunately there are both short term and long-term things that can be done to restore winter habitat. In the short-term, strategically adding complex woody materials (such as old Christmas trees and the trees from tree thinning operations) in areas of existing deep pools, using large logs, rootwads and boulders to create new pools, and building quiet off-channel pools can provide a quick boost in juvenile survival rates. Assuring that the young fish can also avail themselves of existing good habitat--for example making sure the fish can get through tide gates and culverts during the winter to slower- water areas, can also help boost salmon survival.

In the long term replanting trees in streamside buffers, fencing areas where livestock are present, allowing beaver to help re-establish pools, and de-channeling some areas to allow the stream to re-establish its meander will create conditions favorable to Coho survival. The construction of artificial wetlands and other storm water retention systems will also help improve salmon survival by slowing run-off and reducing the pollutants entering the streams and rivers.

Coho in the Nehalem River

Figure 2 shows the number of adult Coho found per mile in the Department of Fish and Wildlife standard surveys sites⁴ from 1950 to the present. If the Current trend continues Coho will be extinct in the Nehalem river in the next the years. Figure 3 identifies the streams and rivers in the lower Nehalem that are utilized by Coho.

⁴ N. Fk. Cronin, W. Humbug, Hamilton, Oak Ranch, N.F. Wolf



**Figure 2 Adult Coho found per mile
Department of Fish and Wildlife standard surveys**

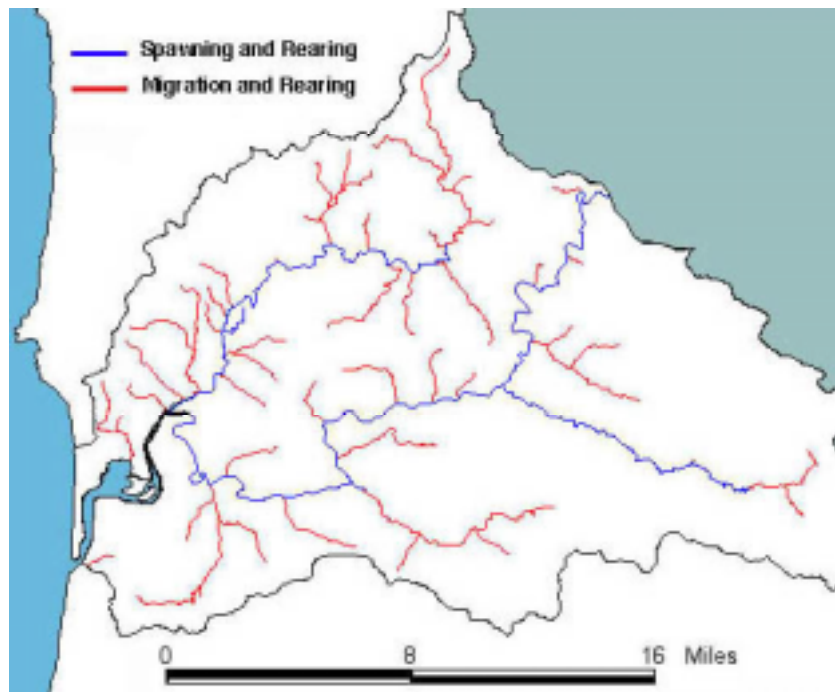
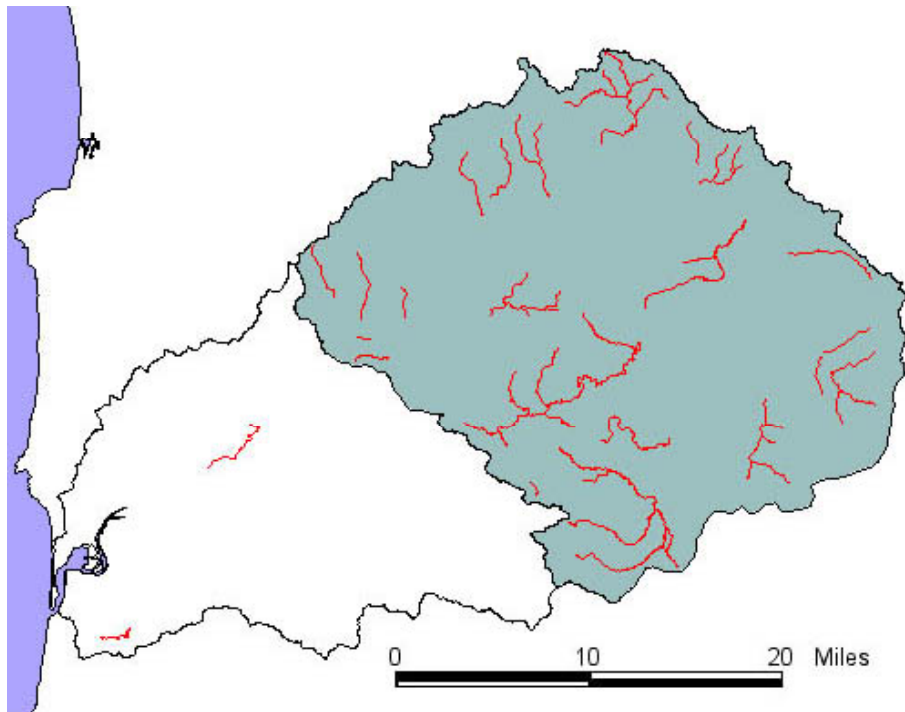


Figure 3 Lower Nehalem Coho Streams

Figure 4 shows the core Coho habitat in the Nehalem watershed. It is clear that the most important habitat for Coho is in the Upper Nehalem river area with only a few core areas in the lower Nehalem watershed.



**Figure 4 Nehalem Core Coho Habitat
Identified by the ODFW**

Currently the Fish Hatchery on the North Fork of the Nehalem River releases 400,000 Coho smolts into the river each year. Hatchery fish have been known to have a negative impact on "wild" salmon⁵.

Specifically they:

- have spread disease to the wild salmon runs.
- have competed with wild fish for food as they travel to the sea.
- are transplanted to streams where they are not as genetically adapted as the native wild fish.

⁵ **Salmon Nation** Edward c. Wolf and Seth Zuckerman, editors; Ecotrust; Portland, Oregon, 1999.

- have had less genetic variability than wild fish because of hatchery breeding practices.
- produce a less adaptable population when they interbreed with wild salmon.
- are significantly less likely to survive in the ocean and return to spawn. (Studies suggest that less than one percent of Coho and Chinook smolts released from hatcheries survive to adulthood)

Hatchery practices have been improved significantly but it is unclear if all of the problems have been solved.

It has been estimated that the historic abundance of Coho salmon (Catch plus escapement) was about 188,000 (circa 1890)
Current abundance is less than 1 percent of historical abundance.