



FISH

Status: Introduced Gamefish

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## CHINOOK SALMON

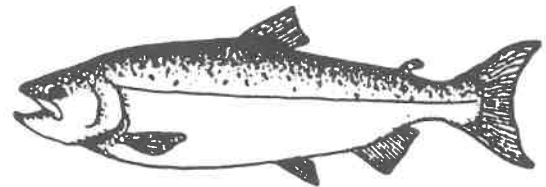
(*Oncorhynchus tshawytscha*)

### Description

The common name of this fish species is taken from the Chinook Indians, a tribe on the northwest coast of America whose survival was linked to these salmon returning to the Columbia River. Other common names for this largest salmon are king, spring salmon, and tyee. Adult chinook salmon are *iridescent* green to blue-green on top. The sides are silvery, turning to white on the belly. Black spots are present on the upper half of the body and on all fins. Chinooks differ from other Lake Oahe *salmonids* by having a gray tongue and black gums. The South Dakota state record chinook salmon is 20 lbs. 4 oz. (9.2 kg) and was caught in Oahe tailwaters on June 11, 1992. The largest sport tackle record is 97 lbs 4 oz. (44.2 kg) from Alaska.

### Distribution

The native range of chinooks in the United States extends from California to Alaska. They were successfully introduced into the *Great Lakes* in 1967. In 1976, North Dakota Game and Fish Department began stocking chinooks (reared from eggs collected from Lake Michigan fish) into Lake Sakakawea. Some of the North Dakota stocked fish moved downstream into Lake Oahe and concentrated at Whitlocks Bay, where eggs were first taken by South Dakota personnel during the fall of 1981. South Dakota Game, Fish & Parks personnel



have stocked chinooks into Lake Oahe since 1982.

### Natural History

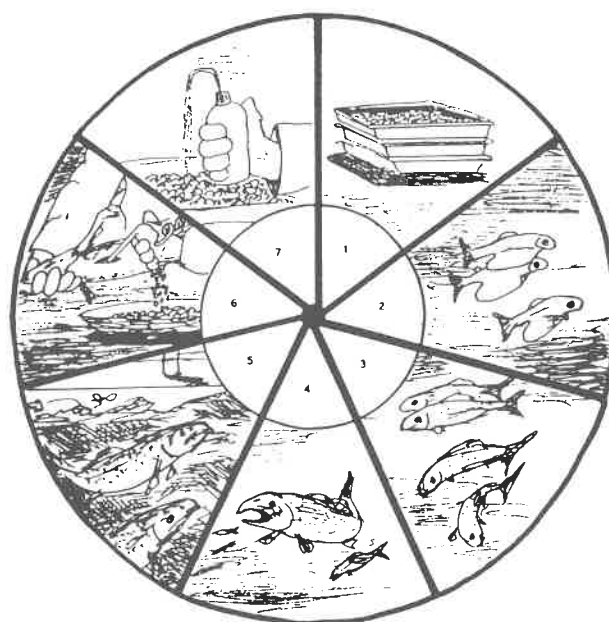
The natural life cycle of salmon is one of the most interesting in nature. Salmon lay their eggs in cool, clean rivers and streams. The female makes a nest, called a redd, by turning on her side and repeatedly flexing her body and tail to form an oval depression in the gravel stream bed. She deposits pea-sized eggs in the nest as a male swims beside her releasing sperm. The fertilized eggs are covered by gravel displaced when the female digs the next nest just upstream. This process is repeated several times before spawning is completed. The eggs stay in the nest all winter and hatch in spring. Chinook salmon, like all Pacific salmon, die after spawning.

After hatching, the young salmon, called alevins, remain in the gravel for a month absorbing nourishment from their yolk sac. When the yolk sac is absorbed, the small salmon, now called fry, emerge from the gravel. Dark stripes on their sides, called parr marks, help camouflage the young salmon from larger fish and fish eating birds. Before juveniles leave fresh water and migrate to the ocean, they undergo a special process called smolting, and are called smolts. During this time, they become silvery in color and their body becomes tolerant to sea water. The smolts stay in saltwater bays where the river meets the ocean for several months feeding on tiny *crustaceans* and small fish.

The young chinooks enter the Pacific Ocean where they grow rapidly on a diet of herring and anchovies. Male and female chinook salmon usually mature and are ready to spawn when they are 3 to 4 years old. Two-year old male spawners (commonly called jacks) usually make up 10% to 25% of the spawning run. Salmon return to their home stream where they were hatched by remembering the smell of that stream. Each stream acquires its own smell from the soil and decaying plants and animals. Fish that migrate from salt to fresh water to spawn are called *anadromous*. During the spawning run, male chinooks develop a hooked jaw and the color of both sexes changes from silver to olive-brown and then black.

In South Dakota, the chinook is a *land-locked* population that begins its life in a fish hatchery. This is because there is no suitable stream to serve as spawning habitat, and no direct access to an ocean. In order to maintain this unique sport fishery, large numbers of salmon are reared and stocked into Lake Oahe annually. Chinook eggs are collected during October and early November at Whitlocks Bay Spawning Station near Gettysburg by Game, Fish and Parks personnel. Each female produces 3,000 to 5,000 eggs. The eggs are transported to state hatcheries for incubation, hatching in December.

The young chinooks are raised to 4 inch (10 cm) fingerlings and then stocked into Lake Oahe at Whitlock Bay during late May and early June. About 250,000 to 300,000 salmon are stocked each year into Lake Oahe. In the lake, the fingerlings grow rapidly, increasing to 14 inches (35.6 cm) after only one year and reaching 6 to 8 pounds (2.7 to 3.6 km) by their third year. Lake Oahe chinook salmon feed primarily on rainbow smelt.



**Figure 1. Chinook Artificial Life Cycle**

1. Eggs incubated at hatchery (Nov. - Jan.)
2. Juveniles reared at hatchery (Feb-Mar.)
3. Smolts imprinted and released (Apr.-May)
4. Salmon forage/caught by anglers.
5. Mature salmon begin spawning run (Sept.)
6. Eggs collected by biologists (Oct.)
7. Salmon eggs fertilized (Oct.)

## Management Considerations

Chinook salmon have become a very popular sportfish for anglers in South Dakota. In 1995, Lake Oahe fishermen caught about 30,000 chinooks. Adult salmon caught in late summer average

about 8 pounds (3.6 kg) with many of the 4 year olds reaching the 10 to 14 pound (4.5 to 6.4 kg) range. The daily limit is 5 fish. Game, Fish and Parks fisheries personnel monitor the salmon population to insure that the fish are growing well and that the *forage fish* numbers are adequate to support this fast growing *predator*.

## Glossary

**Anadromous** - species that lay eggs in fresh water streams, migrate to the ocean where they live for most of their lives, and return to spawn in the same fresh water stream where they hatched.

**Crustacean** - any of a large class (Crustacea) of mostly aquatic arthropods that have two body divisions, two pairs of antennae, one pair of appendages per body segment, and gills. Included in the group are water fleas, shrimps, and crayfish.

**Forage fish** - fish that serve as food for larger, predator fish.

**Great Lakes** - chain of five lakes (Superior, Michigan, Huron, Erie, and Ontario) in the U.S. and Canada.

**Iridescent** - showing rainbow like colors depending on the angle of the reflected light.

**Landlocked** - cutoff from the sea and confined to fresh water by a geographical barrier.

**Predator** - an animal that eats another animal.

**Salmonid** - belonging to the Family Salmonidae, which includes trout and salmon.

## References

Groot, C. and L. Margolis, editors, 1991. Pacific Salmon Life Histories. University of British Columbia Press, Vancouver, British Columbia.

Dean, Tony, 1985. Salmon Mania. Tony Dean Outdoors, Pierre, SD.

Tomelleri, Joseph R. and Mark E. Eberle, 1990. Fishes of the Central United States. University Press of Kansas, Lawrence, Kansas.

## Selected Resources For Teachers

*Discovering Salmon*, a Learning and Activity Book by Nancy Field and Sally Machlis. 1988. Dog-Eared Publications, Corvallis, OR, grades 3-6.

Project WILD Aquatic Guide. Refer to "Hooks and Ladders," page 76.

Project WILD, Natural Source Dakota Project, "Lake Oahe Hooks and Ladders."

*Salmon on the Prairie*, a three minute video for loan from S.D. Game, Fish and Parks, Fisheries Center, Pierre. 1992.

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