Central Valley Fall Chinook Salmon

Oncorhynchus tshawytscha

chances for survival: *better* **4**

PHOTO: ANDREW MAURER.

Fall Chinook are one of four genetically distinct runs of Chinook salmon in the Central Valley. Like other Chinook, they are large and often reach 30 to 34 inches in length. At sea they are silver, but in fresh water they become olive-brown to dark maroon with numerous black spots, a spotted tail and black gums. Fall Chinook migrate upstream in September through December as mature fish and usually spawn within one to two months. Juveniles emerge in December through March, move downstream into the main rivers within a few weeks and rear in fresh water for one to seven months. These fish have adapted to take advantage of productive lowland rivers that historically were often too warm in summer to support salmon. Fall Chinook salmon are ideal for use in hatcheries because they can be artificially spawned as they arrive and the fry only have to be reared for a relatively short time before being released. Fish from throughout the Central Valley are genetically extremely similar due to the constant mixing of hatchery and wild fish and the high rate of straying of spawners away from the rivers where they were born.

CATEGORY	SCORE	EXPLANATION
Range	2	Multiple populations in the Central Valley although only one population genetically
Population size	5	This is the most abundant salmon stock in California
Intervention needs	4	Presumably this ESU would persist even without much human intervention, albeit in small numbers; major intervention is required to maintain fisheries
Tolerance	3	Moderate physiological tolerance and multiple age classes
Genetic risk	5	One genetically diverse population
Climate change	3	Climate change can reduce abundance and survival but their ocean life history strategy makes them the least vulnerable of all runs to extirpation, but not to severe population decline
Overall status	4	
Reliability	4	Well studied although high uncertainty about ocean stage life history

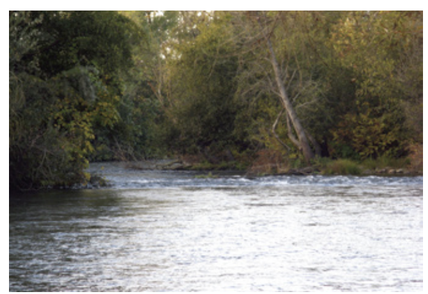
DISTRIBUTION: Fall Chinook once spawned in all major rivers of the Central Valley and migrated as far south as the Kings River to the Upper Sacramento, McCloud, and Pit Rivers to the north. Today, they spawn upstream as far as the first impassable dam on major rivers although on the San Joaquin River they can only travel as high up as the Merced River because of lack of flows in the mainstem.

ABUNDANCE: It is likely that fall Chinook were the most abundant of the four Central Valley runs with about a million spawners per year, plus or minus 200,000 fish. In |the 1960s to 1990s, average production was about 374,000 fish per year, although the number of spawners usually varied somewhere between 200,000 and 300,000 fish, and occasionally decreased to about 100,000. In 1992 to 2005, production averaged about 450,000 fish per year, although this number dropped to less than 200,000 fish in 2006 and to about 90,000 spawners in 2007, despite the virtual closure of commercial fisheries. These numbers include fish of both wild and hatchery origin with hatchery fish comprising up to 90% of the total, depending on the river and year.

FACTORS AFFECTING STATUS: In the 19th century, fall Chinook numbers were depleted by heavy fishing, while hydraulic mining debris buried major spawning and rearing areas. In recent years, principal factors affecting their status have been, (1) dams, (2) water diversions, (3) habitat alteration, (4) commercial fisheries, (5) hatcheries, (6) pollution and disease, (7) alien species, (8) climate change, and (9) poor ocean conditions. The rapid decline of the population in 2003 to 2008 with the subsequent closure of the commercial fishery indicates that these factors can act synergistically.

STATUS 4: Fall Chinook are not at risk of extinction, but their reliance on hatchery production and the recent severe decline of the population indicates that more efforts are required to maintain self-sustaining wild populations. The run is listed as a species of special concern by the National Marine Fisheries Service. Populations of Central Valley fall Chinook could be so reduced in the future as to require permanent closures of commercial fisheries.

CONSERVATION RECOMMENDATIONS: To increase the populations of the Central Valley fall Chinook salmon, the large scale water diversions out of the Sacramento–San Joaquin Delta, loss of juvenile floodplain habitat, commercial fisheries regulation, hatchery fish impacts on wild stocks, and the problems of agricultural and urban pollution need to be addressed.



Merced River. PHOTO: MIKE BIRMINGHAM

1 **2** **3** **4** **5**

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Likely Historic Distribution