Salmonids: Overview

California's salmonid populations were a vital component of American Indian society long before European settlers arrived, and they still play a significant role in today's coastal communities. Salmon provide a living for commercial fishermen, generate recreational marine and freshwater angling opportunities, support tourism within our coastal and riverside communities, fulfill Native American cultural and economic needs, and are important elements of California's highly diverse marine and freshwater ecosystems.

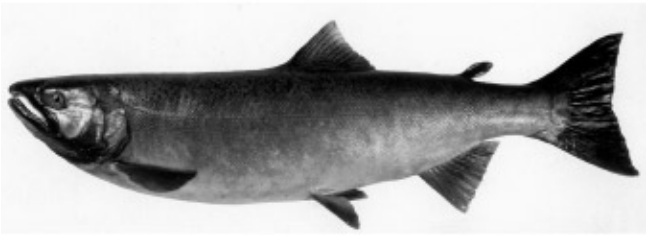
There are seven salmonid species in California. The California fisheries primarily harvest chinook or king salmon *(Oncorhynchus tshawytscha),* which is the salmonid most often encountered by fishermen. Coho or silver salmon (*Oncorhynchus kisutch*) are observed in small numbers but are presently under a no-retention catch policy. Occasionally in odd-numbered years, pink salmon *(Oncorhynchus gorbuscha*) are landed. No fisheries exist for sockeye salmon (*Oncorhynchus nerka*) and chum salmon (*Oncorhynchus keta*) due to their limited numbers in California waters. Steelhead *(Oncorhynchus mykiss)* are caught recreationally in streams and rivers from the Central Valley basin north to the California/Oregon border. Small numbers of cutthroat trout (*Oncorhynchus clarkii*) are found in northern coastal streams, lagoons, and estuaries.

Several government agencies are involved in the management of California salmon. The Pacific Fishery Management Council (PFMC) manages sport and commercial fisheries in the Exclusive Economic Zone (three to 200 miles offshore), the California Fish and Game Commission (FGC) manages inland sport and ocean sport fisheries in state waters (to 3 miles offshore), and the California Department Fish and Game (DFG) manages commercial fisheries in state waters via a delegation from the California Legislature. California continues to have productive commercial and recreational fisheries due to the various conservation measures enacted by the PFMC, FGC, and National Marine Fisheries Service (NMFS). These measures allow for reduced harvest levels on Central Valley and Klamath River fall chinook stocks, while safeguarding the recovery of endangered or threatened chinook and coho populations.

While Central Valley and Klamath River fall chinook stocks continue to be healthy, three salmonid species and ten distinct populations, or Evolutionary Significant Units (ESU), are listed under the federal Endangered Species Act (ESA): Sacramento River winter chinook (endangered), Central Valley spring chinook (threatened), California coastal chinook (threatened), central California coastal coho (threatened), southern Oregon/northern California coho (threatened), southern California steelhead (endangered), northern California steelhead (threatened), and Central Valley, central California, and south-central California steelhead (threatened). In addition, three ESUs are also listed under the California Endangered Species Act (CESA): Sacramento River winter chinook (endangered), Central Valley spring chinook (threatened), and central California coastal coho (endangered).

California's main salmon conservation management objectives are as follows:

- Klamath River fall chinook: a minimum adult natural escapement rate of 33-34 percent, with a minimum spawner escapement of 35,000 adults in natural areas is required.
- Sacramento River fall chinook: an escapement goal of 122,000 to 180,000 hatchery and natural adult fish
- Sacramento River winter chinook: the ESA jeopardy standard is a 31 percent increase in the adult spawner replacement rate relative to the observed mean rate for 1989 to 1993.
- Central Valley spring chinook: the Central Valley spring chinook population is under an NMFS finding of "no jeopardy," and it also benefits from Sacramento River winter chinook conservation measures.
- Coastal California chinook: the ESA jeopardy standard limits the ocean harvest rate for age-four Klamath River fall chinook to 17 percent.
- California coastal coho: the ESA objective requires no retention of coho in any California fishery and limits marine fishery impacts to no more than 13 percent, as measured by projected impacts on Rogue/Klamath hatchery coho.
- Steelhead: fishing regulations were revamped to enact time and area closures, catch and release fishing, or retention of hatchery steelhead only (marked with an adipose fin clip).



Coho Salmon, *Oncorhynchus kisutch*
Credit: DFG

The annual economic value of California's commercial salmon fishery from 1996 to 2000 ranged from 7.7 to 20.9 million dollars to the state's economy, as assessed by the PFMC'S Fishery Economic Assessment Model. The PFMC's economic estimate for California's recreational ocean salmon fishery ranged from 13.9 to 22.5 million dollars for the same period. A 1985 economic analysis estimated that steelhead fishing in the Sacramento River and tributaries directly generated around 7.2 million dollars. Using the above estimates, all salmon fisheries generate approximately 28.8 to 50.6 million dollars annually to the California economy. The indirect economic benefits are difficult to separate and quantify, but it is clear that California's salmonid stocks are a significant revenue source for the state.

As the population of California continues to increase, our relationships with our natural resources also change. Traditional approaches for identifying and solving environmental issues, while still important, must evolve to be effective with today's complex problems. California's salmon fisheries have been increasingly regulated to rebuild threatened or endangered populations, to equitably allocate available fish among stakeholders, and to achieve natural and hatchery spawning escapement goals. Freshwater habitat restoration and revised water management policies are necessary to return natural salmon production to former levels. A collaborative combination of marine and freshwater measures is needed to ensure that salmonid populations will thrive and provide fishing opportunities, economic benefits, and ecological value for all Californians, now and in the future.

Scott Barrow and **Marc Heisdorf**
California Department of Fish and Game