7 Eulachon, *Thaleichthys pacificus*

Eulachon, *Thaleichthys pacificus*. Photo credit: Department.

History of the Fishery

Eulachon, *Thaleichthys pacificus*, is a small anadromous smelt that spawns in the lower reaches of coastal rivers and streams from southeastern Alaska to northern California. Eulachon were called “candlefish” by early explorers due to their high oil content (20 percent by weight), which allowed them to be burned like candles when dried. Nearly all eulachon spawning runs have declined in the last twenty years, especially since the mid 1990s, and in March 2009, the National Marine Fisheries Service (NMFS) proposed listing it as Threatened under the federal Endangered Species Act (ESA).

Although there are reports of 56,000 pounds (25 metric tons) of eulachon sold in the Klamath area circa 1963, official records of smelt commercial landings by species began in 1977. According to the Commercial Fisheries Information System (CFIS), the largest landing of eulachon occurred in 1987 when 3046 pounds (1.4 metric tons) were landed. Since 1990, there have only been two small (each less than 30 pounds; 14 kilograms) commercial landings of eulachon in California.

There is no record of any recreational harvest in California’s ocean fisheries or river hook and line fisheries. Although eulachon supported Native American subsistence dip net fisheries for centuries, and an inland recreational dip net fishery beginning in the 1870s in the Klamath Basin, most of the California dip net fisheries ceased to exist in the late 1980s, coinciding with the decline of noticeable spawning populations in the Klamath River, Mad River and Redwood Creek. To the Yurok Tribe, who reside in the Klamath River Basin, eulachon is considered a “Tribal Trust Species” and still has major cultural significance.

Status of Biological Knowledge

Eulachon are members of the family Osmeridae (true smelts) and are the only species in the genus *Thaleichthys*, which means rich or oily fish. Eulachon range from the Bering Sea to Humboldt Bay, California, and have been observed at depths up to 600 feet (1969 meters). The latest study (1996) conducted by the Yurok tribe found no eulachon in the Klamath River. In the past, the main spawning population in California occurred in the Klamath River with typically smaller runs in the Mad River and Redwood Creek. This spawning population represented the southern most population of the species. In January 2006, a mature male eulachon was caught in a juvenile salmonid monitoring rotary screw trap operation at Knights Landing in the Upper Sacramento

River, indicating that this species is not locally extirpated; however, abundance is very low.

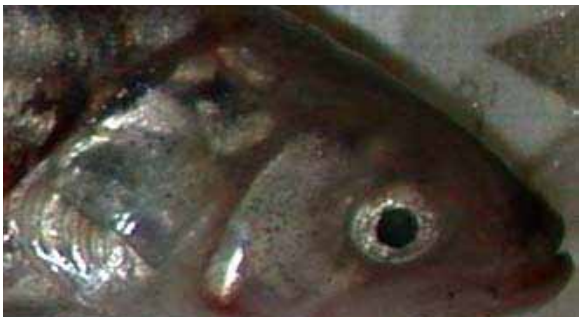

Figure 7-1. Eulachon head showing gill cover with concentric rings and upper jaw length. Photo credit: Department.

Eulachon are the largest of the smelts with mature adults ranging from 7 to 12 inches (17 to 31 centimeters) in length. Their coloration is bluish-brown with fine black speckling on the back and head with silvery sides and belly. They are described as having a thin, long body and a moderately large mouth with an upper jaw bone that extends past the pupil. Striations on the gill cover are prominent and concentric; and the lateral line is complete (Figure 7-1). The pectoral fins extend about two-thirds of the way to the base of the pelvic fins. The first dorsal fin and the anal fin have rays, while the second dorsal fin is adipose (fatty and without rays). Their teeth are small and pointed, with two noticeable canine-like teeth at the top of their mouth.

Although they spawn in the lower reaches of fresh water rivers and streams, eulachon are primarily a marine fish, spending over 95 percent of their lives in ocean waters. In addition, they return to their natal streams, similar to salmonids, although their homing seems to be based more on estuarine water imprinting and is not stream specific. They are broadcast spawners that begin their upstream migration as early as December and peak in March and April. In the Klamath River, adults were usually seen migrating from the mouth of the Klamath to Brooks Riffle (inland 12 miles; 33 kilometers) and occasionally as far upstream as Weitchpec (inland 46 miles; 99 kilometers). They spawned over coarse sand and fine gravel beds with good flowing water. Substantial runs of eulachon on the Klamath River were easily identified by flocks of gulls, increased sea lion activity, and a continuous mass of fish at the water's shoreline.

Eulachon can be sexually mature by age two, but most spawn and die in their third year. A few may live to spawn again in their fourth year, with very few fish making it to year five. However, a recent otolith study suggested that the southern distribution of eulachon is semelparous (spawn only once). During spawning, eulachon may lose (reabsorb) their teeth and the males will develop a pronounced midlateral ridge. The males also develop tubercles (raised growths) on their fins, body and head; tubercle development is not as distinct on the spawning females. The males would typically arrive at the spawning grounds ahead of the females. As the males release their milt, females would lay 25,000 eggs each on average. The fertilized eggs have a double membrane; the outer membrane ruptures and then sticks to the substrate. The larval eulachon hatch in about a month and are washed out to the estuary and nearshore ocean environment. Adult eulachon spend most of their lives in schools between the nearshore and the outer continental shelf environments.

In the ocean, eulachon primarily feed on crustaceans such as euphausiids (krill) and copepods. They are an important part of the diet of many marine mammals, fishes, and birds. Eulachon do not feed in fresh water when they return to spawn.

Status of the Population

Information on the spawning populations in northern California are dependent on direct observations by Yurok tribal members and local biologists. No long term population studies have been conducted; however, it is thought the populations first began declining in the 1970s. Spawning populations were last noticed by Yurok tribal members in the late 1980s.

In 1996, the Yurok Tribal Fisheries Program attempted to sample the eulachon run in the lower Klamath River using dip nets and electrofishing methods. The survey included over 110 hours of survey time and was conducted from early February though early May. No eulachon were sampled in the survey. It appears that the northern California eulachon population has experienced a period of low abundance for over 20 years and may be nearly extirpated from California. Several factors such as changing ocean conditions, dams and water diversions may have led to the decline in spawning populations of eulachon in California; however, these factors have not been studied.

Management Considerations

In 1995, eulachon was designated a state Species of Special Concern by the California Department of Fish and Game which means the species appears to be declining and the population needs to be monitored.

In July of 1999, NMFS received a petition to list the Columbia River eulachon as threatened or endangered. Substantial scientific information was not presented by the petition at that time and additional evaluation of eulachon by state and tribal entities was recommended by NMFS.

In 2000, eulachon was elevated to a federal Species of Concern which signals the species is in serious decline and special management is needed to keep it from being listed as threatened or endangered under the ESA.

In November 2007, NMFS was petitioned to list the southern distribution (in Washington, Oregon and California) of eulachon as threatened or endangered under the ESA. In March 2008, it was determined that substantial scientific information was presented by the petition and a status review of the species was initiated. One year later, the status review of the species was complete and NMFS proposed the listing of eulachon south of the Nass River in British Columbia, Canada, as a federal Threatened species.

Joseph Duran
California Department of Fish and Game

Further Reading

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