

fish was 6.46 inches TL with of 3.39 to 8.46 inches. Their average weight was 1.08 oz. liberation into Lake Jennings, 211 of the catfish were held in a barrel for a period of 21 hours. No mortality occurred.

On November 18, 1969, 2,014 channel catfish, *Ictalurus punctatus*, averaging 6.65 inches were marked with a left pelvic clip and released into Lake Jennings for comparison of growth and harvest rates with the blue catfish.

—William M. Richardson, James A. St. Amant, Lawrence J. Bottroff, and Wayne L. Parker, Inland Fisheries Branch, Region 5, California Department of Fish and Game. Accepted April 1970.

OCCURRENCE ON THE HIGH SEAS OF A STEELHEAD TROUT IN ITS NINTH YEAR

A steelhead trout (*Salmo gairdnerii*) of unusual age was captured in the eastern North Pacific Ocean on September 11, 1969, by the RV *George B. Kelez*, Bureau of Commercial Fisheries. It was taken in a surface gillnet at lat 53°00' N, long 160°00' W (about 100 miles south of the Shumigan Islands, Alaska) during a survey to determine the relative abundance and distribution of Pacific salmon (*Oncorhynchus* spp.). The fish, a female, was 33.7 inches (857mm) long, was emaciated, and was recovering from its last spawning migration (one of four in as many years). About 12 eggs that had been retained in the ovaries after the last spawning were being resorbed, and the next generation of immature eggs was present.

Age determination was made from microprojections of scale impressions on a plastic card (Koo, 1962; Mosher, 1950). The scales showed a freshwater age of 3 years and an ocean age of 2 years before the first of four successive spawnings, plus additional summer growth in 1969 (3.1GGGG+). Thus the fish had completed 8 years and was in its ninth year (Figure 1).

Plastic impressions of scales were sent to several agencies for verification of the age of this fish. All experts agreed on the life history of the specimen (i.e., 3 years in fresh water, 2 years in the ocean, four successive annual spawning migrations, and a period of post-spawning recovery in the summer of 1969). Agreement was not complete, however, on the total age of the fish (8 or 9 years) because of a difference in the interpretation of steelhead age designations by the Koo (1962) formula and by F. H. Sumner (pers. comm., Dec. 18, 1969). According to Mosher (pers. comm.) the use of Sumner's interpretation increases total age of the fish by 1 year—the year that is added between the first year of ocean growth and the initial spawning check.

Most of the literature reviewed showed 7 years to be the maximum age attained by steelhead trout (Snyder, 1925, 1933; Neave, 1940; Pautzke and Meigs, 1941; Meigs and Pautzke, 1941; Shapovalov and Taft, 1954; Maher and Larkin, 1955; Bali, 1959; Withler, 1966; Bulkley, 1967; Narver, 1969). Sumner (1948), however, reported an 8- and a 9-year-old steelhead trout.

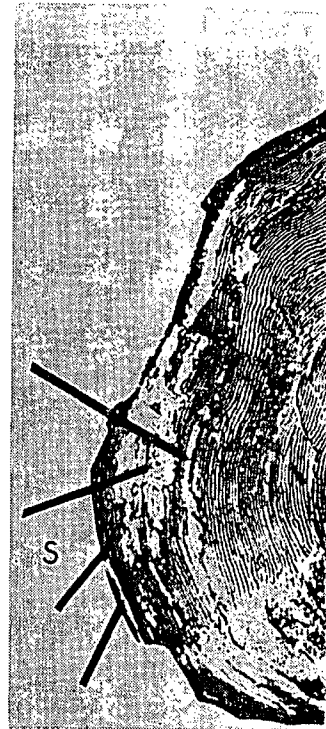


FIGURE 1—Scale of steelhead trout showing water marks ("F"), for age determination (numbers 1-5). Microphotograph.

Because we had captured it and because it had new eggs, it survived to another spawning in its 10th year. The only other steelhead captured at least 25 years ago (Sumner, 1948) was the 1969 steelhead as 9 years old and commercial exploitation since 1945, the average age has decreased (Watt, 1968), as a result of advanced age. Thus, the fish was (or 8-year-old, depending on interpretation) unusual in 1945, would in 1969 be remarkable today.

I thank the following people for their assistance in the capture of the fish: T. S. Y. Koo, Bureau of Commercial Fisheries, Research Board of Canada, and the California Department of Fish and Game Commission.

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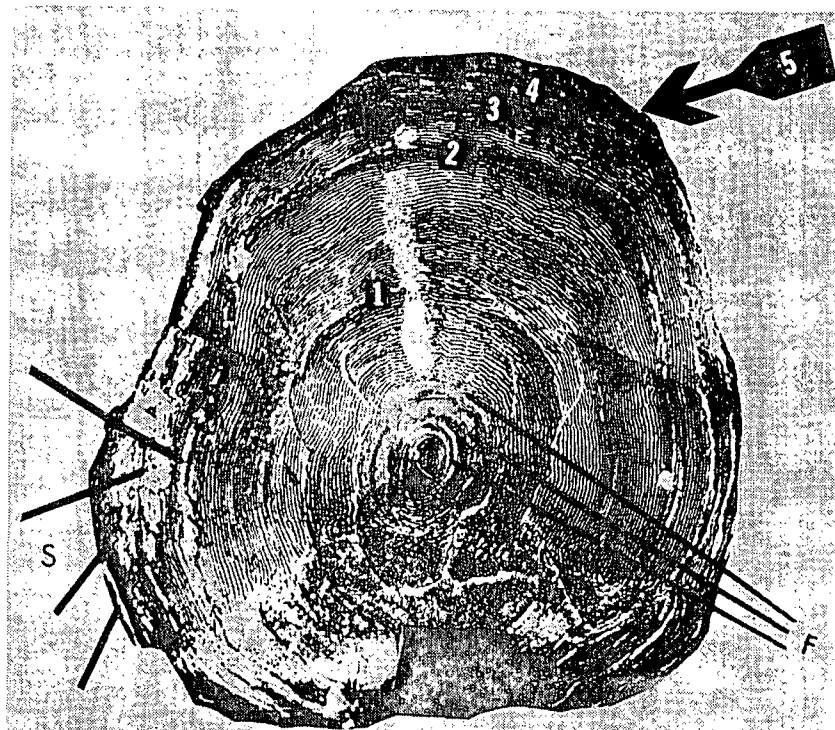


FIGURE 1—Scale of steelhead trout (*Salmo gairdnerii*) in its ninth year, showing three fresh-water marks ("F"), four spawning checks ("S"), and five ocean winter marks (numbers 1-5). Microphotograph by Kenneth H. Mosher.

Because we had captured this fish on the high seas in September and because it had new eggs developing, the fish probably would have survived to another spawning and year of life, thereby putting it in its 10th year. The only other 8-year-old steelhead trout was recorded at least 25 years ago (Sumner, 1948); Sumner aged both his 1945 fish and the 1969 steelhead as 9-year-olds (Sumner, pers. comm.). As sport and commercial exploitation of steelhead trout stocks has increased since 1945, the average age of fish in the population would probably decrease (Watt, 1968), as would the probability of a fish reaching an advanced age. Thus, the fact that a steelhead trout in its ninth year (or 8-year-old, depending on the total age designation used) was very unusual in 1945, would in theory make such an occurrence even more remarkable today.

ACKNOWLEDGMENTS

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OCCURRENCE OF KING (CHINOOK) SALMON IN THE KINGS RIVER, FRESNO COUNTY

On April 3, 1970, three small (10.5-11.0 cm, TL) king salmon, *Oncorhynchus tshawytscha*, were taken from Mill Creek, about 150 m above its confluence with the Kings River, by myself and students of my Ichthyology class. The mouth of Mill Creek is about 2 km below Pine Flat Dam. The presence of salmon in the Kings River drainage has not been reported since the fall of 1942 when Chester Woodhull and William A. Dill, biologists with the Department of Fish and Game, collected small king salmon in the same general area from which the present fish were taken (unpublished report, 1942).

The king salmon has probably not been a regular member of the fish fauna of the Kings River for many decades, if ever. The river drains into Tulare Lake which is connected to the San Joaquin River, by Fresno Slough, only during years of high water. Thus, any salmon in

the Kings River would most likely be the San Joaquin River. Nevertheless, the Dill indicates that previous to 1927, the Kings River by occasionally went up the Kings River. It would seem likely that this occurrence of diversions reduced flows in the lower Kings River. In 1927, salmon runs occurred with greater frequency than in 1938 and 1942. In recent years, presumably because the Kings River has resulted in decreased flows into the Kings River salmon. However, the Kings River has had exceptionally high precipitation and allowed a few king salmon to reach the Kings River. On July 1, 1969, a 30 inch male king salmon was collected below Friant Dam (D. Christenson, personal communication).

Apparently a few king salmon also spawned in the Kings River in other years after 1942; it is noticed simply because no one had looked for them.

The three present salmon were taken from the Kings River which had a temperature of 21 C. The temperature of the Kings River was 13 C. Aside from this temperature, the Kings River was collected from the Creek, in approximately 1942. The Kings River Sacramento squawfish (*Ptychocheilus grandis*), green sunfish (*Lepomis microlophus*), rainbow trout (*Salmo gairdnerii*), smallmouth bass (*Micropterus dolomieu*), white catfish (*Ictalurus catus*), largemouth bass (*Micropterus salmoides*), golden shiner (*Notemigonus crysoleucas*), and rock bass (*Ambloplites rupestris*).—Peter B. Moyle, Department of Fish and Game, Fresno, California 93710. Accepted for publication June 1970.