

13.—FISH-CULTURE ON THE PACIFIC COAST.**By HORACE D. DUNN.**

[From a letter to Prof. S. F. Baird.]

The *Salmo irideus*, or red-banded trout of the McCloud River of California, having been introduced into Atlantic waters, it may interest you to learn how this variety of fish has thrived when introduced into the coast range streams of this State which empty directly into the Pacific Ocean.

On the 12th day of April, 1887, John L. Durkee, while fishing in a small stream which empties into the Pacific Ocean in Marin County, about 7 miles from Saucelito, caught a red-banded trout (*Salmo irideus*) that weighed about 14 pounds. The fish was a female, and had come into the stream to spawn, it being in a gravid condition, so that about a quart of eggs (estimated) flowed from it while being taken from the water. When taken to Saucelito, about five hours later, the fish weighed just 12½ pounds.

This trout was undoubtedly one of a lot planted by the late Mr. S. R. Throckmorton, then fish commissioner of this State, in the stream where it was caught on property belonging then to that gentleman. The marking was a brilliant cochineal color on the gill-cover, say 2½ inches in diameter, and a well-defined stripe or band of the same color 2 inches wide extending from the gill-opening down the median line to and including the tail. So far as I know, the largest specimen of this variety of trout taken in the native stream (McCloud River) has weighed 6 pounds, the fish never migrating from that place to the ocean, a distance of somewhere about 400 miles. This species of trout, under the direction of the late commissioners, Messrs. Redding and Throckmorton, were placed in many of the streams of Sonoma, Marin, San Mateo, and Santa Cruz Counties which empty directly into the Pacific. From these short streams, ranging from 30 to 150 miles long, the fish have ample opportunities to migrate to the ocean, and do so, having been taken in brackish water at the mouths of the streams on various occasions. They seem not only to thrive faster (from abundance of food, no doubt), but take on an outer coating of color (like marking of lead), which they afterwards lose after being in fresh water some time. I think these fish would do well in the short streams along the Atlantic shore between Virginia and Maine.

Some years since the then fish commissioners, B. B. Redding and S. R. Throckmorton, introduced two lots of young striped bass or rock-

fish into San Francisco Bay. The first lot were small fish, say 2 to 3 inches long, and were placed in Suisun Bay, near Martinez, by Mr. Redding in person. These fish thrived and passed the nets of the Chinese and got to sea and returned, one being taken two years later weighing 4 pounds. Another lot was brought from the Atlantic coast in August of the year that Mr. Redding died, and were put into the bay at Arsenal Point, about 3 miles distant from the preceding one. The fish have apparently done well, specimens having been taken in nets at intervals of a few days all through the past two summers. The largest of these weighed 23 pounds. Lately striped bass have been taken almost daily in the waters of the bay near this city, and fish dealers in the markets claim that within the next four years this variety of fish will be as plentiful as shad are now. I am informed that striped bass have been taken at places as widely separated as from San Diego to the Oregon line.

I would suggest sending two tanks of blackfish (tautog, I think), which are common to the Long Island Sound and Southern Massachusetts coast. The late Mr. Throckmorton informed me that some of this kind of fish were sent probably ten years ago, that they arrived alive, and that he put them at once into the waters of San Antonio Creek, near Oakland. These fish have never been heard from, and I think that as they were weak from the journey overland and were placed in muddy water at least 2 miles from any rocky shelter or supplies of food, they fell victims to their enemies, such as dogfish, sharks, and stingrays, through which they had to pass out into the bay. I think it is poor policy to bring adult fish thousands of miles and then place them tired and weak where their enemies are alert and strong. If any blackfish are sent they should be rested and fed in fish-cars for at least a week or ten days until they become strong again and are able to take care of themselves.

The black bass which were brought to California some years since have done well. Those of the State fish commission were placed in the Crystal Spring Reservoir, which in part supplies water to this city. The bass did well, and about four years since some were taken and placed in Russian River, Sonoma County, near Guerneville. These seem to have done well, and spread both up and down the stream, which is fully 100 miles long. Yesterday a bass taken in Russian River, near its entrance into the Pacific, was on exhibition in one of our markets. It was taken in a net and weighed 5 pounds. If they would not destroy the young shad and salmon, the Sacramento would be an admirable stream to place bass in between the junction of Feather River and Red Bluff.

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