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**THE STARRY FLOUNDER**

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**INFORMATIONAL REPORT 79-2**

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## INFORMATIONAL REPORT - STARRY FLOUNDER

### INTRODUCTION

Starry flounder are one of the most widely distributed flounders, occurring from southern California northward along the North American coast to the Aleutian Islands and southward to Korea and Japan.

The starry flounder has made a consistent contribution to the Oregon trawl fishery since its inception with a peak of 1.7 million pounds (771 metric tons) landed in 1976. They are also taken as an incidental fish in the Columbia River salmon gillnet fishery (525,000 lbs [238 m.t.] in 1973) and are a very important recreational species in the estuaries and off ocean bay jetties.

### DESCRIPTION

The starry flounder is easily recognized by the alternating pattern of orange-yellow and dark bars on the fins and rough, stellate (starry) plates on the body. Body color ranges from dark brown to nearly black on the eyed side and creamy white on the blind side.

Starry flounder is one of the few flatfish species which may ordinarily have the eyes and coloration on either side. There is a regional trend in the degree of left-handedness (sinistrality). From California to Southeast Alaska, 50-60 percent of the flounder are left-handed. Around Kodiak Island and the Alaska Peninsula 68 percent are left-handed and in Japan all are left-handed.

## REPRODUCTION

The male starry flounder first attain sexual maturity at the end of their second year when they are about 14½ inches (37 cm) long. Females are three years of age and nearly 17 inches (43 cm) in length when they first reach maturity.

Spawning occurs from November through April. They tend to spawn earlier in California and somewhat later to the north. Spawning fish seek shallow water near river mouths and sloughs. A 22-inch ( 56 cm) fish has approximately 11 million eggs.

## EARLY LIFE HISTORY

The eggs are spherical, measuring about 1/30 inch (.89 to .94 mm) in diameter and pale orange-yellow in color. Their specific gravity is slightly less than that of sea water so that they slowly rise and float at or near the surface. Larvae hatch about 68 hours after fertilization and are about one-sixteenth inch (2 mm) long. They are slender, delicate, transparent, and pelagic. The smallest starry flounder found in adult form (metamorphosed) was slightly less than 1/2-inch (10.5 mm) long.

## ADULT LIFE HISTORY

### Habitat

Starry flounder frequent various types of bottom, appearing to avoid only rock. The largest catches occur over soft sand and they are caught from shallow brackish bay flats only a few inches deep to about 150 fathoms in the open ocean. They are noteworthy among flounders for their tolerance of low salinities and can be found in totally fresh water. In the Columbia River they have been found as far as 100 miles (161 kilometers) upstream.

### Age and Growth

Age of starry flounder is determined by counting annual growth rings (annuli) on scales. Otoliths or ear bones may also be used until the fifth year after which they become too thick and opaque to distinguish annuli.

Growth is rapid for the first year, but by the third year it has slowed substantially. After the second year females are larger than males for a given age. The females have been reported to reach 36 inches (91 cm) in length and a weight of 20 pounds (9.1 kilograms).

### Feeding Habits

Starry flounder are carnivorous; their diet varies with increasing size. Principal food items change progressively from small copepods to amphipods and annelid worms, and then to crabs, clams, and echinoderms. Adult fish have very coarse crushing teeth for breaking up shellfish and other hard-shelled invertebrates. The larger fish also eat other fish.

### Migrations and Tagging

Studies have shown an annual inshore movement during the spawning season but no significant coastwide migration. A study done in the Columbia River revealed that only 23 percent of the flounder tagged in the river moved to the open ocean. The maximum movement for an individual was 130 miles (209 km) north. The rate of migration ranged from 0.1 to 5.6 miles per day for the recaptures taken in areas other than the local trawl grounds off the Columbia River. A Yaquina Bay study revealed that about 75 percent of the tagged flounder caught by the recreational fishery had moved less than 200 yards (183 m) from the tagging site.

#### ACKNOWLEDGMENTS

Information for this report was obtained from the following sources:

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