

DISTRIBUTION OF SKIPJACK TUNA LARVAE IN THE PACIFIC OCEAN

By

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ABSTRACT

Skipjack tuna larvae are distributed over an extremely large area of the Pacific Ocean (Figure 1). In the central and western Pacific the larval distribution extends from as far north as lat. 38°N to as far south as 36°S. The distribution narrows eastward so that in the east-central Pacific east of Hawaii the larvae are taken between lat. 10°N and 20°S. In waters closer to central America they are found between lat. 15°N and 2°-3°S. Along the equator the larvae are found almost continuously across the Pacific, except for a break near long. 110°W.

The wide distribution in the west and the narrow distribution in the east is due mostly to the movement of the prevailing ocean currents, which is generally clockwise in the northern and counterclockwise in the southern hemisphere. In the west warm water flowing poleward expands the area suitable for spawning, hence the wide distribution of larvae, and in the east cool water flowing toward the equator constricts the suitable spawning area to a narrow band.

Larval distribution is associated with warm water. Although skipjack tuna larvae have been taken in waters as cool as 22.1°C, the bulk of the successful plankton tows, both in number of larvae taken and in frequency of captures, are made in waters above 26°C.

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Skipjack tuna larvae are also distributed vertically.

The bulk of the larvae are found in the upper 60 m of water, but larvae have been taken at depths between 140 and 200 m. Within the upper 60 m, most of the skipjack tuna larvae are concentrated in the 20- to 30-m depth range during the day, and they migrate to the surface at night.

In equatorial waters (between lat. 20°N and 10°S, west of long. 150°W; between lat. 10°N and 10°S from long. 100° to 150°W; and between lat. 15° and 4°N, east of long. 100°W) where spawning is most prevalent, the larval catch rates (larvae per tow) are high over a wide section of the ocean, from long. 140°W to 160°E. The catch rate drops off sharply to the east and west, and is close to zero in the area between long. 80° and 100°W. The catch rates of adult skipjack tuna (skipjack per 1,000 hooks) obtained by the Japanese tuna longline follows a similar trend. On the basis of these catch results, it can be stated that the heaviest concentration of skipjack tuna spawning, hence of larvae, is centered in the equatorial central Pacific region.

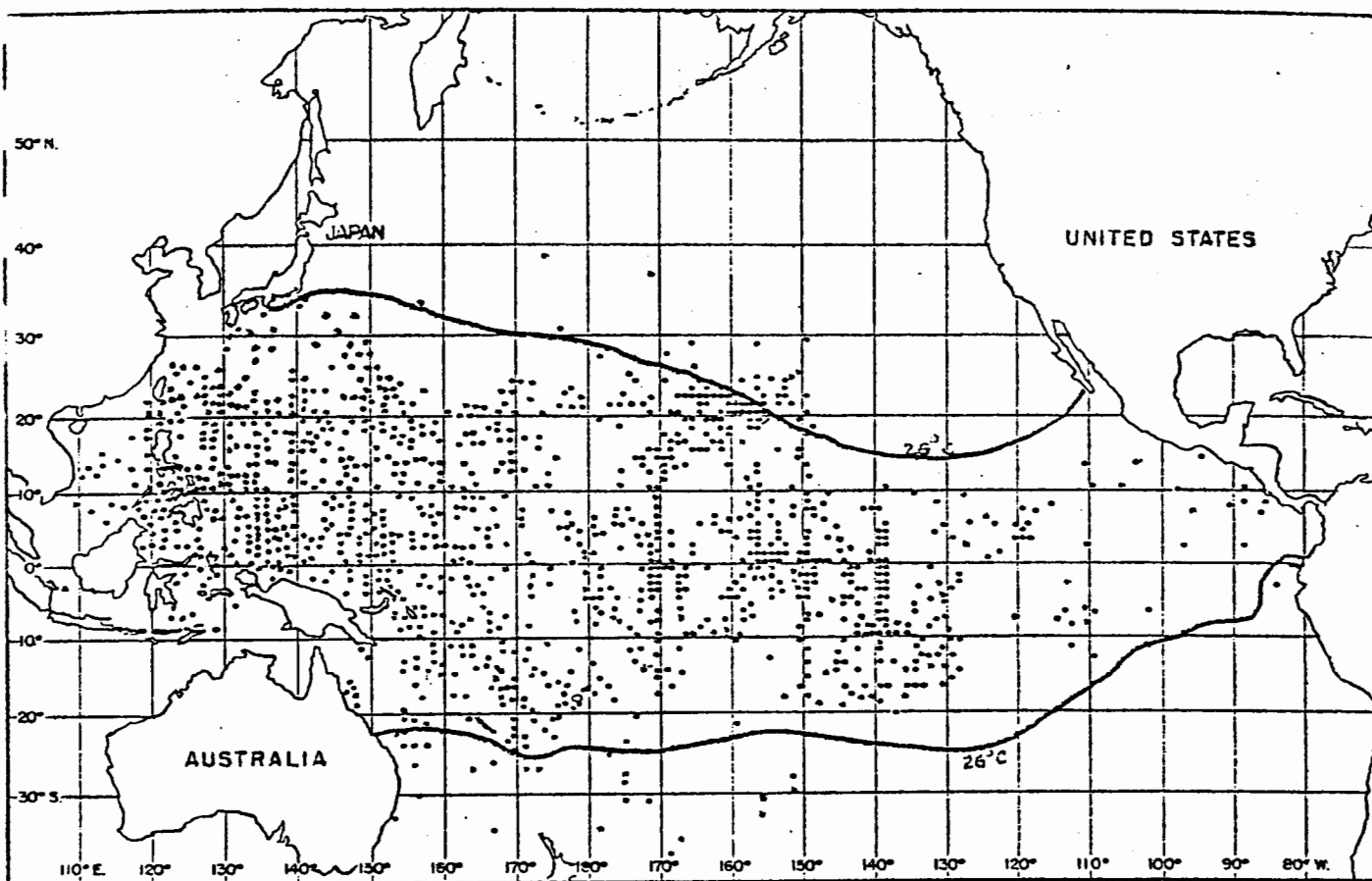


Figure 1.--Capture sites of skipjack tuna larvae, 1949-69. Mean 26° isotherm shown at maximum northern and southern positions.