

## SEASONAL AND GEOGRAPHIC CHARACTERISTICS OF FISHERY RESOURCES

### California Current Region--IV. Pacific Mackerel

David Kramer and Paul E. Smith

The fishery for the Pacific mackerel (*Scomber japonicus*) was until 1936 the third largest in southern California, surpassed only by those of the Pacific sardine and tuna. This mackerel has declined until, in 1970, a 2-year moratorium was implemented by the California Legislature in an attempt to conserve the remainder of the resource and to assist in its revival.

Unlike our previous reports in this series (Kramer and Smith, 1970a, b, c), which briefly discuss the potential for each of the fisheries described, this deals only with the seasonal and geographic characteristics of the Pacific mackerel resource and describes briefly its decline and the result.

Summerized data (1951-60) for the Pacific mackerel from the collections of the California Cooperative Oceanic Fisheries Investigations (CalCOFI) show that the major centers of spawning (10% or more occurrences of larvae in standard plankton tows) appear first in January in a small, inshore area south of Point Eugenia, Baja California (Figure). (The organizations, area of investigations, and treatment of the data were reported by Kramer and Smith, 1970a). The extent of the spawning centers remains small in this area with a trend of spawning northward--in 5% or more occurrences of larvae--until April, when the major centers extend farther offshore and to areas off northern Baja California. Finally, in May, the centers of spawning appear off southern California and, by July, extend a considerable distance offshore and north of Point Conception. Later, by October, the centers are found only off central Baja California. (Data for August, September, November, and December in the decade are insufficient for summarization to show the trends depicted in figure.)

#### Its Range

The Pacific mackerel once ranged from southeast Alaska (Rounsefell and Dahlgren, 1934) to Banderas Bay, Mexico (John E. Fitch, California Department of Fish and Game--CF&G--correspondence). CalCOFI data on mackerel larvae (Kramer, 1960, 1969) indicate that the spawning populations extend only as far north as Point Conception, California. Richard E. Parrish (CF&G, correspondence) has reported repeated traces of Pacific mackerel taken with jack mackerel off Pt. Sur, California. Data on larvae indicate that the Pacific mackerel extends southward along the coast and into all of the Gulf of California. Larvae found by the CalCOFI (Ahlstrom, 1956) at the mouth of the Gulf indicate that the resource may extend at least to Banderas Bay, as reported by Fitch.

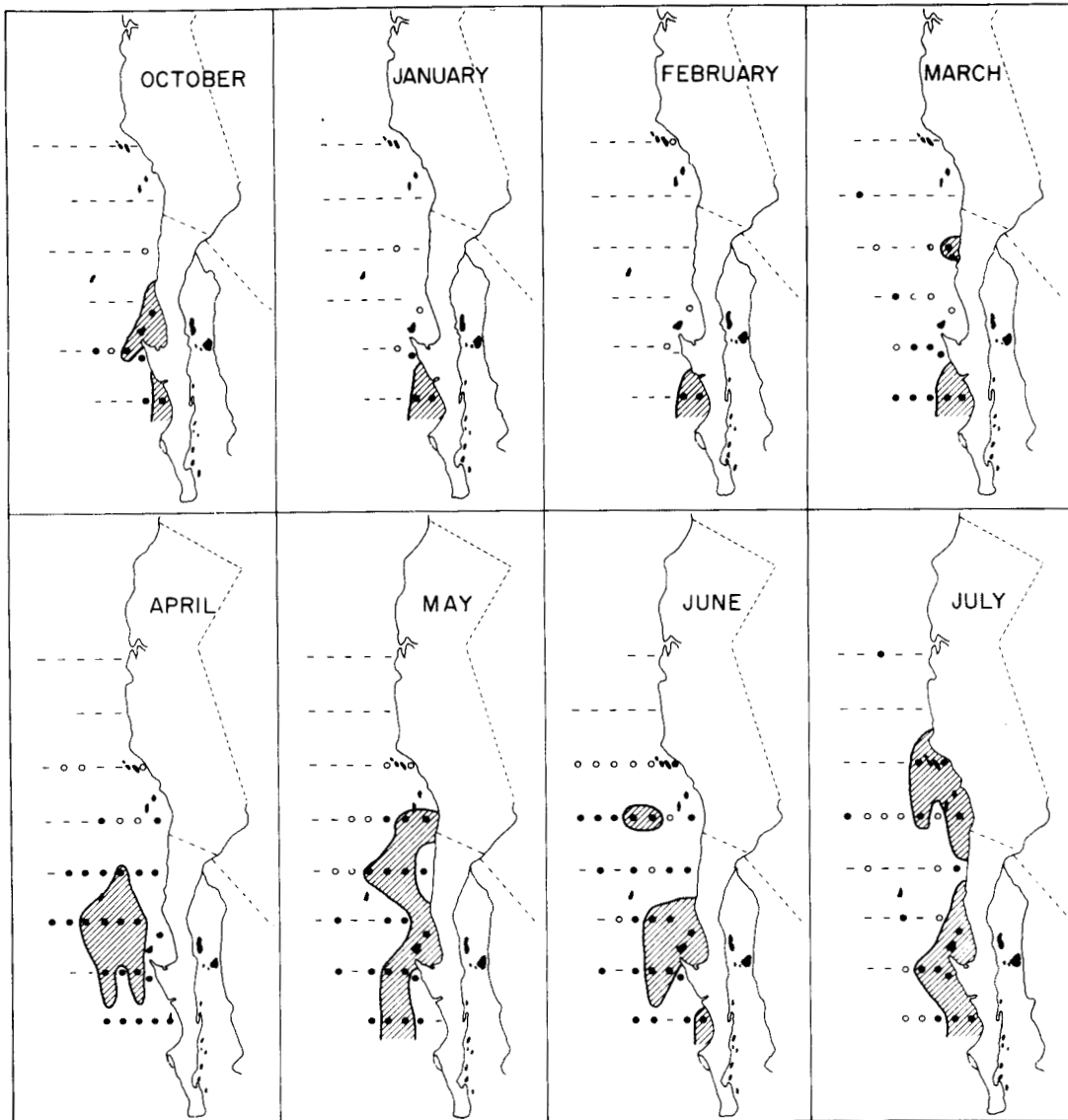
#### Tagging Program 1935-1943

In 1935-43, a tagging program was carried out by CF&G (Fry and Roedel, 1949) in order to understand the movements of the mackerel and determine to what degree the populations from other areas (Roedel, 1952) contributed to the major fishery off southern California. Mackerel were tagged throughout their range--by the Fisheries Research Board of Canada off the Columbia River, and by CF&G from central California to San Roque Bay, about half way down Baja California. Tag returns showed that there was an interchange of fish throughout the region covered by the program, and that all regions contributed to the southern California area.

#### Decline of Fishery

Blunt and Parrish (1969) reported that this major California fishery, which reached a

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Percent occurrences of Pacific mackerel larvae in 1951-60 on the survey pattern of the California Cooperative Oceanic Fisheries Investigations (CalCOFI). Each line, circle or dot represents a pooled statistical area (see Kramer and Smith, 1970a). (o)--less than 5% occurrence; (●)--equal to or greater than 5% occurrence; shaded area--equal to or greater than 10% occurrence; (-)--area occupied with no occurrence.

peak catch of 73,000 tons in 1935, had declined to record low catches of 583 tons in 1967 and 1,565 tons in 1968. Also, that in Baja California the catch had been declining since 1963 and, in 1968, had dropped to 1,334 tons. This decline is reflected in part by our summarized data for 1951-60, where "high" abundance of spawning populations are indicated by 10% or more occurrences of larvae. (Our previous reports on relatively abundant fishes used 49% for jack mackerel, 20% for Pacific saury, and 50% for Pacific hake.)

Blunt and Parrish estimated the present spawning biomass of Pacific mackerel at less than 5,000 tons. They stated further that "Certain environmental factors detrimental to good recruitment are indicated and if this continues through 1969, long term loss of the fisheries is a distinct possibility." In 1969, California landings were 1,178 tons; no fig-

ures are available for Baja California landings for that year.

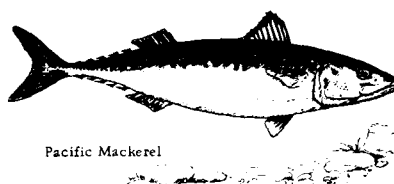
#### Legislature Acts

On March 31, 1970, the California legislature passed a bill providing that "Pacific mackerel may not be taken or possessed at any time for any purpose except loads or lots of fish may contain 18% by weight of Pacific mackerel taken incidentally to other fishing operations. Such Pacific mackerel, incidentally taken, may be used for any purpose." This is a 2-year act to "... remain in effect only until the 61st day after adjournment of the 1972 Regular Session."

On August 14, the Governor of California signed the bill into law. It will go into effect on November 25, 1970.

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