

Seasonal Occurrence of *Brevoortia patronus* in the Northern Gulf of Mexico¹

The menhaden purse-seine fishery in the northern Gulf of Mexico depends upon the seasonal appearance of fish schools at the surface and near the coast in spring. In autumn the schools disappear from near-shore waters and apparently move offshore. Efforts to determine the location of menhaden schools in winter have been generally unsuccessful. The southern coast of Florida and the eastern coast of Mexico have been suggested as likely places of winter occurrence (Reintjes and June, 1960). This report gives data on seasonal movements of menhaden in the northern Gulf of Mexico which suggest that the population does not move far offshore in winter.

Locations of occurrence of largescale menhaden, *Brevoortia patronus* Goode, in the Gulf of Mexico were obtained by examining the station records from cruises made by the U. S. Bureau of Commercial Fisheries exploratory vessel *Oregon* over the period May 1950 through April 1962. Additional data were compiled from samples of industrial otter-trawl catches landed between October 1958 and April 1962. Exploratory fishing by the *Oregon* during the 12-year period extended throughout the Gulf of Mexico at stations identified by depth contours ranging from 3 to 2,000 fathoms. Efforts of the industrial otter-trawl fleet were concentrated in the northern Gulf of Mexico in 1 to 30 fathoms. Menhaden were caught with flat, balloon, and midwater trawls, with lampara seines, and with dip nets under light. No attempt has been made to indicate the relative abundance of menhaden at any place or time because of the variety of types and sizes of sampling gear used.

¹ Contribution No. 171, U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Texas.

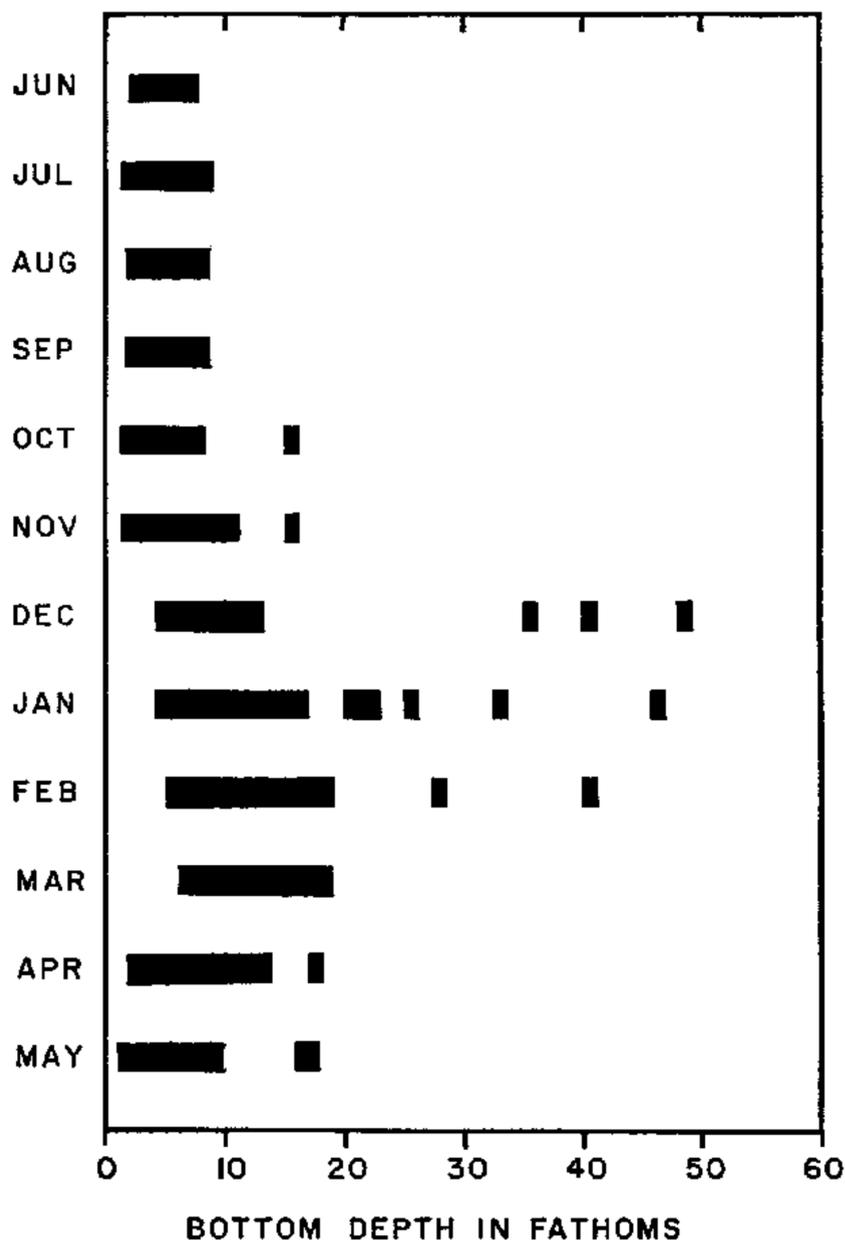


FIGURE 1.—Offshore distribution of largescale menhaden according to bottom depth at fishing positions of the MV *Oregon* and the industrial trawler fleet, Gulf of Mexico, 1950-62.

Figure 1 shows the monthly occurrence of *B. patronus* according to bottom depth at fishing position from catches by the MV *Oregon* and by the industrial otter-trawl fleet.² From June through September, menhaden were present from 1 to 8 fathoms between Aransas Pass, Texas, and the Mississippi River Delta; and east of the Delta between Chandeleur Islands, Louisiana, and Gulf Shores, Alabama. The latter area includes Breton, Chandeleur, and Mississippi Sounds. During October and November, menhaden were taken at depths up to 12 fathoms west of the Delta, and up to 15 fathoms east of the Delta. From December through February, fish were present from 4 to 18 fathoms both east and west of the Delta, as well as over depths ranging from 20 to 48

² Geographical distribution of menhaden in this study is expressed in terms of depth at the positions where sample material was obtained. Fish were actually taken at all levels from the surface to the bottom.

fathoms within an area 10 to 40 miles east and northeast of the Delta. In March, April, and May, fish occurred from 1 to 17 fathoms between Ship Shoal, Louisiana, and the entrance to Empire Canal, Louisiana; and from 1 to 18 fathoms between Pass a Loutre, Louisiana, and Gulf Shores. No largescale menhaden were caught south of latitude $28^{\circ} 00'$ North.

The monthly distribution of largescale menhaden shows a pattern from which movements may be inferred. Beginning in October, an apparent offshore movement from the shallow waters of the northern Gulf of Mexico is indicated. By December some menhaden have moved to the 48-fathom depth range off the Mississippi Delta. Incomplete analysis of length-frequency data suggests that both offshore and inshore fish represent the same population.

The findings in this report lead us to conclude that at least part of the stocks of *B. patronus* winter on the inner and middle continental shelf area just off the Mississippi River Delta over bottom depths ranging from 4 to 48 fathoms. Those fish that are present close to shore in winter probably represent the inshore fringe of the main population. Additional facts which support the view that the bulk of menhaden winter relatively near the summer fishing grounds are: (1) No menhaden have been taken beyond the edge of the continental shelf; and (2) the onset of purse-seine fishing for menhaden in spring takes place nearly simultaneously along some hundreds of miles of coastline, indicating the unlikelihood of local concentrations having traveled any great distance.

If further exploitation of the menhaden resource in the Gulf of Mexico is anticipated, we suggest that increased emphasis be given the accumulation of information concerning winter movements and offshore distribution.

LITERATURE CITED

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CHARLES M. ROITHMAYR
RICHARD A. WALLER

U. S. Bureau of Commercial Fisheries
Pascagoula, Mississippi