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Distribution, Migrations and Morphology of Large Pelagic Fishes

by

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In 1965 we again concentrated on tagging large pelagic fishes, especially the young bluefin tuna, Thunnus thynnus, which have been subjected to increased fishing pressure. Size composition and log book data were collected concurrently. Despite the shortest tuna seining season in recent years, we released 1,630 bluefin, while cooperating sportsmen and scientists marked 180 others, including many giants.

The return rate of 10% of the year's releases of young bluefin was about half of those obtained in 1964 and 1963. This decrease may have been due to the brief period of availability and to the decrease in the seining fleet from 21 vessels in 1964 to 13, of a much smaller average size, in 1965. On the other hand, the rate of return from the previous year's releases equalled the previous high obtained in 1964. This may indicate superior effectiveness of new tags of our design which contributed nearly all of these second-year recoveries. Tags from 28 per cent of the 465 young bluefin released in 1964 have already been returned.

The local movements indicated by the 1965 recoveries were very similar to those revealed in 1964. The center of the recaptures shifted southward from off central New Jersey to the area off Delaware Bay and then northward. The latest recaptures were south of eastern Long Island and in the approaches to New York harbor. Incomplete log book data indicates that since the peak year of 1963, the seine fishery for young bluefin has declined each year in length of season, extent of fishing area, and total catch. In 1965, however, the local fleet extended its season into September by fishing giant tuna in Cape Cod Bay for the first time. Size sampling indicates that the catch (excluding the large fish taken in Cape Cod Bay), consisted mainly of 1-, 2-, and 3-year-old fish.

Skipjack tuna, Euthynnus pelamis, failed to appear in quantity and only four returns were obtained from 437 fish released in 1965, in contrast to a ten per cent return in 1964. Limited sampling indicated that the catch again consisted mainly of fish of the 6-pound class. Oddly enough, however, our first second-year return from a skipjack came from a fish which reportedly weighed twenty pounds when released.

Seven tag returns for white marlin, Tetrapturus albidus, added to the evidence that many of the individuals which concentrate off our middle Atlantic states in summer come from the vicinity of the West Indies and the Bahamas in spring and depart to the northeastward as fall approaches. They fit in with previous returns suggesting a clockwise migratory pattern, possibly related to the general circulation of the northwestern Atlantic.

We continued to collect distributional and descriptive data on these fishes and on swordfish, Xiphias gladius. Bartlett is co-authoring papers with P. C. Wilson of the Bureau of Commercial Fisheries, Gloucester, tabulating exploratory long-line catches of tunas and swordfish in the northwestern Atlantic, and with Dr. W. B. Scott of the Royal Ontario Museum and J. S. Beckett of the Fisheries Research Board of Canada on the morphology of swordfish from the same area. A neuston net developed by Bartlett was used very effectively during five cruises, collecting at least 31 larval swordfish and many juvenile Seriola.

Laboratory work centered on the systematics of 840 specimens of the genus Seriola. This study was greatly aided by X-ray techniques developed by this project (Bartlett, M. R. and R. L. Haedrich; in press, "Techniques in the Radiography of Fishes", Trans. Amer. Fish. Soc., 95 (1): 99-101), by means of which the vertebral column and the median fins and their supports could all be shown on a single plate. The arrangement of interneurals and dorsal pterygiophores between the neural spines enabled us to positively identify three 32 cm. S. fasciata which, due to their exceptionally large eyes, differed strikingly from our previously determined material ranging between 1 and 24 cm. A paper on Atlantic Seriola is in preparation and one on those of the Indo-Pacific region is planned.