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Pertintent Statistical Data for the Management of Maryland and Virginia Fisheries

Philip W. Jones

Joseph Loesch
Virginia Institute of Marine Science

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by

Philip W. Jones
Chesapeake Biological Laboratory
Solomons, MD 20688

and

Joseph Loesch
Virginia Institute of Marine Science
Gloucester Point, VA 23062

Statistical records of the commercial fisheries of Chesapeake Bay[1], which have been compiled periodically since 1887 and annually since 1929, are the basis of our historical knowledge of commercial landings and fishing effort in Maryland and Virginia waters. The primary purpose of collecting commercial fisheries statistics has been to determine the number of fishermen, gear, and boats in the commercial fishery, and the total weight of each species landed. Prior to 1944, these statistics were estimated for both Maryland and Virginia fisheries from correspondence or interviews between federal and state personnel and large-scale commercial fishing operations, representative watermen, captains of licensed fishing vessels, wholesale fisheries firms, and packing and canning houses.

Since 1944, all licensed fishermen in Maryland have been required to maintain and submit a daily record of catch and effort which includes the weight of each species landed, the location fished, the amount of gear used, and the catch by gear type. Additional reports on unlicensed gear, excluding hook and line catches in Chesapeake Bay, have been obtained as annual estimates through correspondence or personal interview. In Virginia, commercial fisherman are not currently required by law to maintain records of catch and effort. However, some data are obtained through cooperating fisherman by VIMS and the Virginia Marine Resources Commission.

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[1] Published as Fisheries Industries of the United States through 1938, and as statistical digests of the U.S. Fish and Wildlife Service or the National Marine Fisheries Service titled Fisheries Statistics of the United States through 1976 with the exception of 1943.

The recreational fisheries of Chesapeake Bay have been monitored periodically at the state or federal level since 1937. These programs were based on creel census, personal interviews or mailed questionnaires, and were directed towards estimating the number of fishermen, hours fished, and weight of the catch by species in either a specific region within the Bay, or in the mid-Atlantic region, which extends from the northern border of New Jersey to Cape Hatteras, North Carolina.

Estimates of catch and effort in both the commercial and recreational fisheries of Maryland and Virginia have been too imprecise to allow a detailed analysis of fish stocks in Chesapeake Bay (Rothschild et al., 1981)[2]. Additionally, the statistical system currently in use does not provide a mechanism to: 1) determine the reliability of catch and effort reports in the commercial fishery; 2) determine the length and age structure of the catch; and 3) support a long term monitoring program to obtain catch and effort statistics for the recreational fisheries in the Bay.

A comprehensive statistical program is needed for Chesapeake Bay fisheries which would facilitate the detailed study of fish stocks in Maryland and Virginia waters. Single species models (Beverton and Holt, Cohort Analysis, Ricker, and Schaefer) are the state-of-the-art in fishery management planning. These models require, in part, estimates of catch, effort, population size, age structure, sex ratios and growth and mortality rates. Additionally any component of a model may be a research objective itself. Accordingly, we have outlined a program to collect the most desirable data for the commercial and recreational fisheries in Chesapeake Bay and the coastal Atlantic Ocean off Maryland and Virginia.

Commercial Fisheries in Chesapeake Bay

Data for the commercial fisheries in Chesapeake Bay should include, at a minimum, location, date, vessel classification, gear type, effort and catch by species. In addition, length and age distributions should be periodically determined for each species taken in both size-selective and non-size-selective gears. Where lacking, relationships among age, length and weight should be determined. Ideally,

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[2] Rothschild, B. J., P. W. Jones and J. S. Wilson. 1981. Trends in Chesapeake Bay Fisheries. Proceedings 46th North American Wildlife and Natural Resources Conference. Contribution No. 1133, Center for Environmental and Estuarine Studies of the University of Maryland.

catches in specific gears should be documented as follows:

Gill nets - by gear type (anchor, stake or drift) and amount of gear (length and depth) of each mesh and thread size.

Pound nets - by mesh size of the lead into the pound and the pound itself, and length of the lead into the pound.

Haul seines - for each set, by mesh size and length and depth of the net.

Fyke net, hoop net, pots and traps - by number of gear fished.

Lines set with hooks and trot lines - by total length of the line and number of hooks or baits per line.

A monitoring program to collect these statistics must be implemented. Catch and effort for each gear type and the total amount of each gear fished could be obtained from records kept by commercial fishermen. However, the vital statistics of age and length distributions by gear type cannot be collected by this group. A comprehensive subsampling-program to obtain these kinds of data would have to be developed and conducted by appropriate state organizations. For current estimates of population size, mark and recapture studies would also have to be undertaken. For early forecasts of year-class strengths, reliable juvenile indices must be developed.

Coastal Atlantic Ocean Fisheries

In addition to gill nets, pots and traps, otter trawls and purse seines are used extensively in the Maryland-Virginia coastal fisheries. The data cited as necessary for monitoring stocks in Chesapeake Bay are also pertinent for understanding the coastal fisheries. In the trawl fishery, effort would be the number of trawling hours; in the purse seine fishery effort would be the length and depth of the gear and the number of times that the net was pursed. Also, data for vessel tonnage and the nature and size of the propulsion system are often necessary for definition of a sampling unit.

Recreational Fisheries

Data for the recreational fisheries should include, at a minimum, the number of each species caught, location and method of capture, amount of gear fished, number of hours fished and age-size data. To obtain these statistics, it would be necessary to implement a Bay-wide, long-term creel census and interview program.

The vastness of the Chesapeake Bay would necessitate the establishment of subregions and sampling effort would be in proportion to the intensity of fishing activity in the subregions. A log book reporting procedure needs to be developed for the charter boat fleet in order to estimate total catch in this component of the recreational fishery. A dockside census would also be necessary for the collection of set and size data as well as to collect scale samples for aging the catch.

At the present time, there is no satisfactory method of gathering long-term catch and effort statistics for the recreational fisheries of Chesapeake Bay, even though the landings of some species in this fishery are substantial. The implementation of a program to determine catch and effort in this fishery would be enhanced by the institution of a recreational fishing license for tidal waters of Chesapeake Bay. This would provide a means of identifying participants in the recreational fishery and would facilitate a monitoring program to collect catch and effort data based on random surveys of sport fishermen in the Bay.

We realize that the program we have outlined to collect catch and effort statistics for the commercial and recreational fisheries of the Bay is extensive. Although the specific data requirements of individual fisheries may be less than those described in this paper, because of the variety of fishing gear and the diversity in the recreational and commercial fish species in Chesapeake Bay, a comprehensive monitoring program must be relatively complex.