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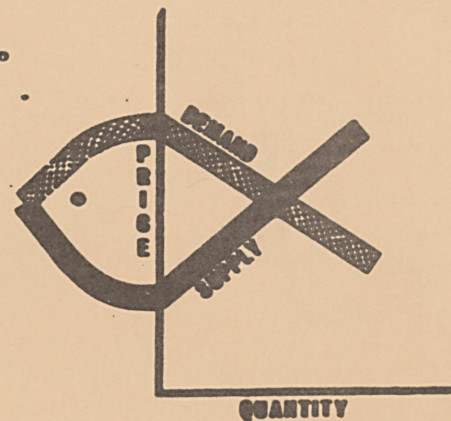
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Critique of Moshman Proposals for a  
Sport Fish Statistics Program in NMFS  
and a Discussion of Some Alternatives

by

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U.S. NATIONAL MARINE FISHERIES SERVICE  
ECONOMIC RESEARCH DIVISION



CRITIQUE OF MOSHMAN PROPOSALS FOR A  
SPORT FISH STATISTICS PROGRAM IN NMFS  
AND A DISCUSSION OF SOME ALTERNATIVES

by

Robert R. Wilson, Donald P. Cleary, and Richard A. Winnor<sup>1/</sup>

This critique was prepared by Robert Wilson, Donald Cleary and Richard Winnor to assist Dr. Hoyt Wheeland with positive commentary and suggestions on the forthcoming sport fish statistics program (SFSP). These comments are offered with a spirit of good will, mutual interest, and cooperation. The Moshman report stimulated our thinking and we have spent some considerable time attempting to define a set of helpful questions and comments.

I. REVIEW OF THE MOSHMAN REPORT AND A FEW COMMENTS

The Moshman firm is highly reputable and the professional qualifications of Dr. Moshman are unimpeachable. The Moshman study, though perhaps fully worth the contracted amount in terms of effort expended and information produced somehow missed its mark of designing a desirable SFSP. The failure of the Moshman product stems from the fact that the task of the Moshman study was of immense proportions, the immensity of which was perhaps not fully recognized at the initiation of the study. Moshman Associates and/or the Statistics and Market News Division should not receive criticism because any problems that may have arisen are all elements of the particular phase in the planning of the SFSP in which NMFS finds itself.

- A. The Moshman survey asked a series of simple questions to respondents:

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<sup>1/</sup>This paper was written relative to the preliminary rather than final report arising from the Moshman survey. The points made herein seem pertinent in that a general approach to the design of a sport fish statistics program is discussed.

- (1) What statistics do you need?
- (2) What degree of aggregation is acceptable in these statistics?
- (3) What degree of sampling error is acceptable in each statistic?
- (4) What frequency of collection and publication is acceptable in each statistic?
- (5) By whom and for what purpose will each statistic be used?

Other questions were asked about existing data sources and why further data were needed if existing sources were available.

The questions focus on the immediate needs of the respondent and discourage requests for data or statistics that might be highly desirable in a National SFSP but not of immediate use.

B. We feel that a more direct set of questions would be more appropriate.

- (1) What type of data or statistics do you feel needs most to be included in a National Sport Fish Statistics Program?
- (2) Why do you feel that these statistics or data elements need to be included?
- (3) To what uses would you or others with whom you are associated put these statistics?

The second approach asks the respondent to consider from a broad viewpoint the type of SFSP that would be of the most value to the Nation, rather than to meet his immediate needs. Some respondents such as the

Economic Research Laboratory attempted to answer the Moshman questionnaire from such a broad viewpoint. Apparently, the data requests of such respondents were considered only to a limited extent, if at all in the Moshman report.

Given the limiting nature of the questions asked by the Moshman questionnaire and the limited numbers of responses solicited, it is extremely doubtful that the Moshman report could or did achieve a representation of the data priorities of the respondents.

C. The data elements were divided into four groups:

- (1) screening interview
- (2) questionnaire -- priority 1
- (3) questionnaire -- priority 2
- (4) questionnaire -- priority 3

The screening interview asks questions about each respondent in a household (age, sex, position in household) and about his participation in all fishing, saltwater fishing and water related sports within the past year and within the recall period. The questionnaire--priority 1 data elements ask for each fishing occasion within recall period. Catch by species, species sought, location of fishing, type of fishery, method of fishing, and number of hours spent fishing. The data elements under priority 2 contain for each occasion disposition of catch, type of bait used, type of equipment used, miles of fishing location from home, number of days away from home and total expenditures.

Reported under priority 3 for each occasion are occupation of angler, income of angler, amount of investment in boats, amount of investment in other angling equipment, expenditures by item. A host of other types of data were not assigned any priority.

The review committee recommended that data elements 1, 2, and 3 have extremely high priority and they should all be included in any national survey.

- D. Secondary and tertiary priorities could then be assigned to elements of data not considered in the report of Moshman Associates.
- E. The Moshman survey resulted in an assignment of priorities that led to the development of three plans of very low yield in terms of information. If the frequency of collection of the data and the magnitudes of relative errors are disregarded, neither Moshman Plan I nor Plan II produces as much in formation about sport fish, fishing and fisheries as is available with the quinquennial combination of the survey of hunting and fishing and the saltwater angling survey. Only Plan III approaches this standard, but at an annual cost of \$2,000,000. It is recognized as this statement is made that the expenditure data in the survey of hunting and fishing is of little usefulness for economic research.

F. There is some evidence that screening interviews will be more of a problem than the Moshman report considered them to be. The survey of hunting and fishing indicated that there were in 1970 just under 10 million persons over 12-years of age who fished in saltwater two or more times, or roughly 5 percent of the U.S. population. The Moshman screening method would pick up all persons regardless of age who fished at least one time during a two-month recall period, an unknown fraction. The example calculations made in the Moshman report suggest that the report disregarded that the average number of recall periods in which a fisherman engages in saltwater fishing is likely to be only one or two rather than six. The number of saltwater fishing households could be only 20 to 50 percent of those expected and the cost of data could be 100 to 500 percent above the expected amount.

It is absolutely necessary to use a minimal cost screening device.

Many ingenious methods of screening have been devised and careful planning should be given in selecting the method.

G. We believe that if telephone interviews or mail questionnaires are used for screening, it would be possible to increase drastically (perhaps as much as 500 to 1,000 percent) the number of households screened and the number of fishing households ultimately interviewed.



- H. The Moshman report recommends exclusive reliance on household personal interviews. Using this technique it isn't possible, within reasonable budget constraints, to produce catch data of sufficient geographic accuracy to be useful for assessing the impact of sport fishing on given stocks of fish.
- I. A more appropriate recommendation would have been imaginative combinations of household survey, creel census, mailed questionnaire, telephone interviews, and angler panel methods.

We conclude that Moshman has not recommended the most efficient survey designs and techniques. Efficient data collection is imperative given our very limited budget.

- J. It is not suggested in the Moshman report that the SFSP should be a constantly changing program that adapts to the needs of the users of the data generated, but rather a fixed program that may produce much data that becomes unneeded or unusable as scientific knowledge progresses.

A system of fixed data collections cannot support the changing data needs of productive research.

- K. The employment of a group of sampling and survey design experts to advise NMFS on technical matters, and the monitoring of contractors was suggested by ERL to the Moshman questionnaire but was not recommended in the Moshman report.

Summary

- (1) Priorities of data needs are likely still undefined.
- (2) Priority data elements 1, 2 and 3 should be included in any National survey.
- (3) In terms of the quantity of information collected, the Moshman Plans appear to be very inefficient.
- (4) Moshman did not recommend the most efficient survey designs and data gathering techniques.
- (5) A system of fixed data collections cannot support the changing data needs of productive research.
- (6) The plan proposed did not address the needs of the groups within the Office of Resource Management, the Office of Resource Research, the Office of Resource Utilization, and certain Regional Offices within NMFS.
- (7) The proposed SFSP does not contain a mechanism to produce management data for certain important local or regional fisheries.

## II. SUGGESTED CRITERIA FOR ASSESSING THE ADEQUACY OF ALTERNATIVE SPORT FISH STATISTICS PROGRAMS

- (1) An adequate Sport Fish Statistics Program (SFSP) should address itself to data needs of all groups within NMFS and outside groups from which opinions were solicited for research, management, policy and/or operational data. Given the budgetary limitations possibly imposed on the SFSP it would seem absolutely necessary for it to first attempt to produce a national overview for all NMFS users

with finer geographical breakdowns as relative error and budget criteria permits.

- (2) For certain local but very important fisheries the SFSP should produce data on a fine enough geographical breakdown to provide a basis for management decisions on their minimal budgetary limitations.
- (3) An adequate SFSP should address itself to achieving precision for regional, State, or finer geographical data breakdowns after it has considered National needs and important local fishery needs.
- (4) An adequate SFSP should employ the most efficient known sample and survey designs and combinations of data collection methods, in order to achieve the least cost per unit of data for a given level of relative error.
- (5) An adequate SFSP should involve sufficient pretesting and research to allow response bias elimination and/or assessment, to achieve efficient designs and survey methods, and to achieve desirable statements of survey questions.
- (6) An adequate SFSP should be an evolving program, adding new elements of data or dropping old as scientific knowledge advances or as budgetary limitations change.
- (7) An adequate SFSP should be managed in such a way that specialized skills of personnel of other groups within NMFS and outside of NMFS re-employed on a cooperative or contracted basis to obtain the best possible data collection technology.

- (8) An adequate SFSP should produce data that would underwrite substantial research efforts by universities and other research organizations at no further cost to NMFS. That these criteria seem most reasonable and desirable is an understatement.
- (9) The SFSP should be developed according to data priorities assigned in the best interest of NMFS as a whole.

The Moshman report contains plans for an SFSP which may possibly meet only two of the nine criteria proposed above, criteria 5 and 8. Criteria 1, 2, 3, 4, 6, 7 and 9 cannot be met by the Moshman Plans. The criteria we suggest may be incomplete or may need revision, but generally speaking they appear to be most reasonable. It would seem that any SFSP should contain as many as possible of these elements.

### III. SUGGESTED CRITERIA FOR ASSIGNING PRIORITIES FOR COLLECTION OF CERTAIN DATA ELEMENTS

- A. Priority 1 - data that are needed for the defense and support of NMFS programs in sport fish areas.
- B. Priority 2 - data that are needed for direct implementation of NMFS action programs on sport fish problems.
- C. Priority 3 - data that are needed for research that will be directly implemented in NMFS action programs on sport fish.
- D. Priority 4 - data that are needed for other research on sport fish.

These priorities may or may not be mutually exclusive or exhaustive and undoubtedly need further refinement.

## IV. SUGGESTED COURSES OF ACTION DURING THE REMAINDER OF FY 1973

We suggest that a working task force within NMFS be assigned to accomplish the following:

- A. Implement an assignment of priorities to data elements according to the criteria above.
- B. A very careful investigation of techniques used by other researchers with the purpose of discovering optimum-cost methods of data collection.
- C. A study of response bias phenomena on questions other than species and size recollection such as recall on expenditures, lengths of questionnaire effects and social value by ~~pathetical~~ questions.
- D. Assure that a proper combination of techniques are used to achieve optimum costs and the collection of highest priority data under the criteria for priorities and to meet ~~insofar as possible, the~~ criteria for an adequate SFSP.



