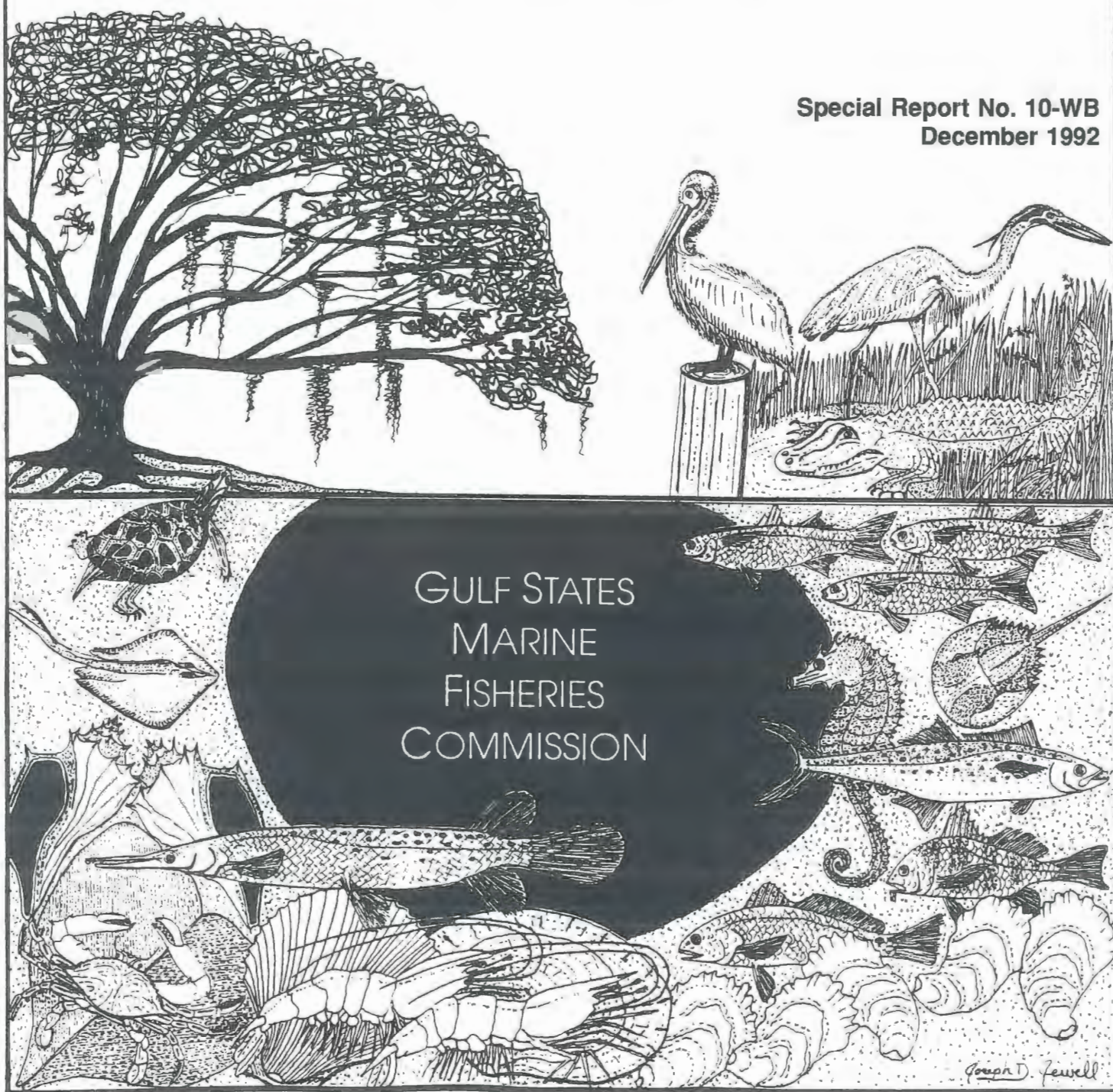


MARINE RECREATIONAL FISHERY DATA COLLECTION AND MANAGEMENT PROGRAMS IN THE GULF OF MEXICO REGION

Identification and Resolution of Issues

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IN THE
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Identification and Resolution of Issues

Results of the Proceedings of the

Technical Coordinating Committee's
Data Management Subcommittee

of the

Gulf States Marine Fisheries Commission

December 31, 1992



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INTRODUCTION

Recreational fishing represents a major consumptive use of marine and estuarine fishery resources in the United States. In 1991, the southeast region accounted for nearly 50% of the total effort and 51% of the total numbers of marine and estuarine finfish caught nation-wide (National Marine Fisheries Service, undated). This translates to an estimated 34 million fishing trips and 201 million fish. As evidenced by the above figures, the recreational fishery of the southeast region is significant, having major biological, social, and economic implications for management agencies with regulatory authority and stewardship responsibility over fishery resources.

In the past several years, combined commercial and recreational fishing activities, coupled with declining quality and quantity of suitable habitat, have resulted in most major fisheries being stressed or overfished. This situation has led to a large number of state, interstate, and federal fishery management plans (FMPs) which contain complex sets of regulatory measures including bag limits, size limits, quotas, seasons, and gear restrictions, among others. In order for fishery managers to effectively formulate and implement such complex regulatory measures, it is necessary to have a reliable program for the collection and management of fishery data.

Prior to 1979, efforts to collect and manage recreational fishery data were sporadic and limited in time and space. These surveys, while useful on a limited time and space basis, were not sufficient to meet the region-wide needs for fishery data. In 1979, in response to the passage of the Magnuson Fishery Conservation and Management Act of 1979, the National Marine Fisheries Service (NMFS) implemented the Marine Recreational Fishery Statistics Survey (MRFSS) which was designed to provide regional and national estimates for catch and effort by mode and area along with limited biological data. The precision and accuracy, and thus the usefulness, of the MRFSS data base are greatly reduced when applied to smaller-than-regional areas such as state jurisdictions or large bay systems. This situation has resulted in duplication of effort as states have implemented or continued their own surveys or attempts to use the "best available data" as provided by the MRFSS with less than desirable results. Some states have opted to augment the MRFSS with state or other federal funds to increase the level of intercepts, thereby increasing the precision and accuracy of the estimates for their states. While this approach can achieve the desired results, most states have not opted to augment the MRFSS, despite efforts by the NMFS to gain such cooperation, for a variety of reasons, including:

- 1) existence of some long-term state surveys and disagreement between the NMFS and the states regarding which survey(s) is better, more cost-efficient, and able to maintain comparability with existing data bases;
- 2) concerns by the states and other users of the MRFSS data base about the design of the survey, statistical calculations, and, perhaps most important, quality control, especially when the survey has been contracted to private consulting firms;
- 3) contracting roadblocks; and
- 4) lack of funding

Numerous attempts to solve these problems have been made in the form of correspondence, presentations of the MRFSS methodology, meetings, among other avenues; however, regional cooperation is still lacking.

In February 1989, the Data Management Subcommittee (DMS) of the Technical Coordinating Committee (TCC) of the Gulf States Marine Fisheries Commission (GSMFC) conducted a workshop which began an initiative to examine existing marine recreational fishery (MRF) data collection and management programs and evaluate the extent to which those programs meet fishery management needs. That first workshop resulted in a series of identified issues, resolution of some of those issues, and an agenda for the next several years to resolve the remaining issues (Proceedings: Workshop on Marine Recreational Fisheries Statistics Collection in the Gulf of Mexico 1989, Executive Summary, Appendix 1). Over the following three years (1990 - 1992), a series of meetings, workshops, and studies addressed the issues identified in 1989, providing resolution of many of those issues and guidance for future efforts to collect and manage MRF data.

GOAL

The DMS established the following goal for the MRF data initiative:

Achieve a cooperative recreational fisheries statistics survey program that provides the best possible data, in the most cost-efficient manner, to satisfy management needs of involved agencies in the Gulf of Mexico.

ISSUES AND RESOLUTIONS

The following issues or problems were raised at the 1989 workshop. Resolution of these issues and problems is intended to contribute to the development of a comprehensive MRF survey which will achieve the stated goal. In 1989 in the Gulf of Mexico region, the only active MRF surveys were the Texas survey and the MRFSS. Many of the recommendations pertain to both surveys; however, a significant number were intended to be considered by NMFS through the MRFSS, since that survey was then and continues to be active in the remaining four Gulf States and along the Atlantic seaboard.

Issues Resolved

1. Issue - Sampling Allocation: Sampling allocation is proportional to activity on site, after a minimum base level of sampling is met for each cell. Since 1987, allocations in the MRFSS have shifted more to the southeast, and in the Gulf of Mexico, were shifted to the boat mode to better address mackerel issues. All shore modes were combined into one strata to accommodate these shifts. Historical data should be collapsed for shore modes to maintain comparability among years.

Resolution: While this issue was raised and discussed regarding sampling allocations among regions and modes, results of the discussion clarified reasons behind the allocation scheme (related to funding levels and data needs), and therefore no action was recommended.

2. Issue - Weathered Out Sample: Current procedures of the MRFSS state that a scheduled day may be rescheduled if small craft warnings are in effect, or sampling at a site is terminated or changed to an alternate site if no interviews are encountered within two hours.

Resolution: Following discussion of the issue, the workshop participants reached consensus that the procedures provided enough criteria to address the problem while assuring efficiency.

3. Issue - Data Codes: Water body codes listed in the manuals do not appear to be useful to many states. The procedure in the past has been that when an individual state begins a cooperative effort with the MRFSS, desired codes and additional items are discussed and agreed upon.

Resolution: The discussion revealed that the process apparently works well and satisfies states involved in the MRFSS.

4. Issue - MARFIN Add-on: The issue involves timeliness of estimates and the level of intercept sampling as it is related to reduction of the variance associated with estimates. A MARFIN grant was provided to NMFS to increase the level of sampling and to decrease the amount of time needed to provide estimates to fishery managers. During the project, intercept sampling was more than doubled, and data processing was enhanced to allow for monthly estimations rather than the normal two month wave.

Resolution: Based on the analysis at the time of the workshop, the consensus of the participants was that the objectives of the project were met, and that additional sampling effort resulted in the predicted response of a decrease in the variance of the estimates.

5. Issue - Outliers: Outliers, specifically related to number of trips, are not deleted from the data. Responses exceeding three standard errors from the mean are identified and the fishermen are recontacted, if possible, to verify their responses. If the response is verified and still exceeds the three-standard-errors criterion, the response is adjusted to the 95% limit of the range of data. This adjustment is necessary because of small sample sizes.

Resolution: The consensus of the participants of the workshop was that the small sample sizes forced the approach used on outliers, and that possibly some other approach could be used if sample sizes were increased significantly.

6. Issue - Quality Control: Species identification was discussed as a major concern, although all aspects of quality control were addressed. Training for the MRFSS was one day long and considered to be inadequate. Supervision was indirect, although dry-labbing (making up data) of data is probably negligible because of call-backs to interviewed fishermen. Interviewers working for the subcontractor do not have the benefit of coordinating on a daily basis with others involved in the survey.

Resolution: The Gulf States, in cooperation with the NMFS, developed and published "Marine Recreational Fisheries Statistics Survey Intercept Survey Standards for Quality Control" (Gulf States Marine Fisheries Commission,

March 1989, Appendix 2). This document was adopted in large part by the NMFS for inclusion in the operation of the MRFSS.

Workshop participants recommended that the NMFS develop an MRFSS Operations Manual which contractors would use, rather than having contractors develop their own manuals which may change when the contractor changes. The NMFS implemented this recommendation, thereby improving interviewer training and supervisory procedures.

At the recommendation of the workshop participants, the NMFS is in the process of developing a technical manual which will clarify and document survey statistical sampling design and data expansion.

7. Issue - Availability of NMFS Data and Publications: It was pointed out during the workshop that many of the states and other potential MRFSS data users are not aware of all publications or data files available from the MRFSS. It was recommended that the NMFS compile and distribute such a list.

Resolution: The recommendation as worded was considered to be impractical, due to the magnitude of files which are available from the MRFSS. However, as a means of making the majority of data files available to users, the NMFS now distributes them on diskettes to the states and councils following each wave.

8. Cluster Sampling, Variance Estimates, and Unequal Sampling Probabilities: Calculation of variances was discussed at length. Cluster sampling is used, but variances do not incorporate cluster techniques. This leads to concerns that variances may be significantly underestimated. There was concern about expansion of variances that ignored adjustments for the ratio of telephone owners to the total population. There was also concern that the telephone survey should be conducted on a stratified basis nation-wide. Frequency of outside statistical review and publication of findings was also discussed. The NMFS reported that they are concerned about several sources of variance.

Resolution: As recommended, the NMFS has developed a listing of their current and potential statistical concerns regarding the MRFSS. That listing is available from the NMFS Headquarters Office, Statistics Division. Other recommendations related to this issue remain unresolved, and will be discussed later in this report.

9. Issue - Long Term Improvements in Collection of Recreational Fishery Statistics: Future improvements and modifications to the MRFSS and other recreational fishery statistics programs were discussed and the following objectives established:

- a. increase cost effectiveness and efficiency
- b. collect all data vital for effective management
- c. assure accuracy of estimates for all states
- d. provide for cooperative estimates

Several recommendations were made which will help achieve the objectives established above. They include a thorough analysis of the "for-hire" component of the recreational fishery, identification of all data elements that should be obtained through a recreational fishery statistics collection and

management program, including social and economic data, and investigations into the use of new technological advancements for data entry and access to achieve near-real time data handling.

Resolution: Appendix 3 is the Executive Summary of the proceedings of several workshops which were held to fully analyze the "for-hire" component of the recreational fishery. The full document, entitled "Proceedings: Workshop on Marine "For-Hire" Recreational Fisheries Survey Methodology" is available from the GSMFC.

The GSMFC sponsored several workshops during 1990 - 1992 during which a number of issues related to recreational fishery data collection and management were addressed. During that time, a thorough examination and identification of data elements, including social and economic data, needed for fishery management, and which should be included in a comprehensive recreational fishery data collection and management program, was conducted (Table 1). Those data elements which are distinct to the "for-hire" component, and should be collected in addition to those data elements found in Table 1 for a comprehensive treatment of the "for-hire" fishery, are found in Table 2.

Finally, a workshop session was held during which demonstrations of new technologies for data collection and transfer were provided to the GSMFC TCC DMS. Appendix 4 provides a report on items which were demonstrated and their application to data surveys. Several other recommendations which were made regarding the issue of future improvements and modifications of existing surveys remain unresolved and will be addressed later in this report.

ISSUES AND RECOMMENDATIONS FOR FUTURE ACTION

10. Issue - Site Selection: There are problems with inaccuracies in site inventories sent to the states, states not receiving inventories on a regular basis, and inadequate procedures, documentation and specified time frames for updating inventories. There is inadequate sampling of some fish species due to their seasonality. This problem is directly related to limited sample sizes. The MRFSS does not rely on pure probabilities for site selection; however, good representation is important.

Recommendations:

- a. Explore using historical intercept data to set sampling probabilities, rather than relying on hearsay information from access operators, fishermen, or subjective interviewer opinion. Current thinking is that using historical intercept data which may be flawed due to past site selection procedures may result in erroneous site data. This issue should still be investigated.
- b. Schedule regular rather than opportunistic site inventory updates. While this is thought to be a continuous process, there is no single factor that will automatically trigger a review of the site inventory and any necessary updates. A full review of this issue is still warranted.

Table 1. Data items needed in the management of a fishery, assessed as to different data collection methodologies.
S=Self-reported, O=Observed, Dash=Not Collectable.

Category Item	On-Site					Off-Site					Priority
	Rove	Access Site	Catch Cards	Aerial	On-board Observer	Log Book	Random Phone	Known Phone	Mail	Door to Door	
Demographics/Sociology/Economics											
Residence - Zip	S	S	S	-	S	S	0	0	S	0	High
Party size	0	0	0	0	0	S	S	S	S	S	High
No. of participants	-	-	-	-	-	-	S	S	S	S	High
Avidity	S	S	S	-	S	S	S	S	S	S	High
Gender	0	0	S	-	0	S	S	S	S	0	Low
Age	S	S	S	-	S	S	S	S	S	S	High
Income	S	S	S	-	S	S	S	S	S	S	High
Race/ethnic group	S	S	S	-	S	S	S	S	S	S	High
Motivation (catch-related)	S	S	S	-	S	S	S	S	S	S	High
Satisfaction	S	S	S	-	S	S	S	S	S	S	High
Experience (years fished)	S	S	S	-	S	S	S	S	S	S	Low
Specialization (self-perceived skill)	S	S	S	-	S	S	S	S	S	S	Low
Species preference	S	S	S	-	S	S	S	S	S	S	High
Travel costs	S	S	S	-	S	-	-	S	S	S	High
Fishing costs	S	S	S	-	S	-	-	S	S	S	High
Willingness to pay	S	S	S	-	S	-	-	S	S	S	Low
Disposition - catch Surveyed before (frequency)	S	S	S	-	S	-	-	S	S	S	High
	S	S	S	-	S	S	S	S	S	S	Medium

Table 1. Continued.

Category Item	On-Site					Off-Site					Priority
	Rove	Access Site	Catch Cards	Aerial	On-board Observer	Log Book	Random Phone	Known Phone	Mail	Door to Door	
Demographics/Sociology/Economics											
Effort											
Geographic area where landed	S	S	S	0	0	S	S	S	S	S	High
Geographic area where fished	0	0	0	-	0	S	S	S	S	S	High
Time and date of return	0	0	S	-	0	S	S	S	S	S	High
Trip duration	S	S	S	-	0	S	S	S	S	S	High
Fishing time	S	S	S	-	0	S	S	S	S	S	Low
Fishing power											
Boat length	0	0	S/O	-	0	S	S	S	S	S	High
Passenger capacity	S	S	S/O	-	S	-	-	S	S	S	High
Speed	S	S	S	-	S	-	-	S	S	S	High
Fishing gear	0	0	S/O	0	0	-	-	S	S	S	High
Fishing method	0	0	S/O	0	0	-	-	S	S	S	High
Bait type	0	0	S/O	-	0	-	-	S	S	S	High
Hook type	S	S	S	-	0	-	-	S	S	S	Low
Biological											
Gross catch											
Number released											
Dead	S	S	S	-	0	S	S	S	S	S	High
Alive	S	S	S	-	0	S	S	S	S	S	High

Table 1. Continued.

Category Item	On-Site					Off-Site					Priority
	Rove	Access Site	Catch Cards	Aerial	On-board Observer	Log Book	Random Phone	Known Phone	Mail	Door to Door	
Biological Cont.											
Reason	S	S	S	-	0	S	S	S	S	S	High
Species											
composition	S	S	S	-	0	S	S	S	S	S	High
Sex	S	S	S	-	0	-	-	-	-	-	High
Biological											
data ^a	S	S	S	-	0	-	-	-	-	-	High
Tag returns	S	S	S	-	0	S	S	S	S	S	Low
Weight	S	S	S	-	0	-	-	-	-	-	Low
Length	S	S	S	-	0	-	-	-	-	-	High
Landings											
Number	0	0	S	-	0	S	S	S	S	S	High
Species											
composition	0	0	S	-	0	S	S	S	S	S	High
Sex	0	0	S	-	0	S	-	-	-	-	High
Biological											
data ^a	0	0	S	-	0	S	-	-	-	-	High
Tag returns	0	0	S	-	0	S	S	S	S	S	Low
Weight	0	0	S	-	0	S	-	-	-	-	Low
Length	0	0	S	-	0	S	-	-	-	-	High
Abiotic											
Windspeed	0	0	S	0	0	S	S	S	S	S	High
Wind direction	0	0	S	0	0	S	S	S	S	S	High
Cloud cover	0	0	S	0	0	S	S	S	S	S	High
Moon phase	0	0	S	0	0	S	S	S	S	S	High

Table 1. Continued.

Category Item	On-Site					Off-Site					Priority
	Rove	Access Site	Catch Cards	Aerial	On-board Observer	Log Book	Random Phone	Known Phone	Mail	Door to Door	
Abiotic (cont.)											
Current											
Surface	S	S	S	-	0	-	-	S	S	S	High
Bottom	S	S	S	-	0	-	-	S	S	S	High
Water temperature	S	S	S	-	0	-	-	S	-	-	High
Air temperature	0	0	S	0	0	-	-	S	-	-	High
Barometric pressure	0	0	S	0	0	S	S	S	S	S	High
Precipitation	0	0	S	0	0	S	S	S	S	S	High
Fog	0	0	S	0	0	S	S	S	S	S	High
Wave height	S	S	S	0	0	S	S	S	S	S	High
Tide	0	0	S	0	0	S	S	S	S	S	High
Water depth	S	S	S	0	0	S	S	S	S	S	High
Bottom type	S	S	S	0	0	S	S	S	S	S	High

^ Biological data includes such items as maturity stage, gonads, fin spines, otoliths, scales, etc.)

Table 2. Additional data items needed related specifically to the management of for-hire fisheries activities.
S=Self-reported, O=Observed, Dash=Not Collectable.

Category Item	On-Site					Off-Site					Priority
	Rove	Access Site	Catch Cards	Aerial	On-board Observer	Log Book	Random Phone	Known Phone	Mail	Door to Door	
<u>For-Hire Operator</u>											
Residence - Zip	S	S	S	-	S	S	0	0	S	0	High
Boat ID	0	0	S	-	0	S	S	S	S	S	Low
Annual or seasonal no. of trips	S	S	S	-	S	S	0	0	S	S	High
Motivation	S	S	S	-	S	S	S	S	S	S	Low
Satisfaction	S	S	S	-	S	S	S	S	S	S	Low
Experience (years)	S	S	S	-	S	S	S	S	S	S	Low
Species targeted by trip	S	S	S	-	0	S	S	S	S	S	High
Revenues	-	-	S	-	-	-	-	S	S	S	High
Fixed costs	-	-	S	-	-	-	-	S	S	S	High
Variable costs	-	-	S	-	-	-	-	S	S	S	High

11. Issue - Residential Waterfront Sites: Residential waterfront sites are not surveyed in the on-site intercepts currently in place; however, their effort is included in the telephone estimates. Catch rates for vessels departing from a residential access site are assumed to be similar to catch rates for other fishermen.

Recommendation: No specific recommendation was offered for resolution of this issue. If catch rates for this sector are not different and effort estimates continue to be acquired, then it is not a significant issue. However, a special study could be conducted to verify catch rate differences between residential and other access sites.

12. Issue - MRFSS Telephone Survey Methodology: The question allowing both telephone and on-site respondents to identify themselves as freshwater or saltwater results in corresponding data for both components, but it causes underestimation of saltwater fish landed by fishermen who fish in brackish water areas but consider themselves freshwater fishermen. If respondents request help in identifying saltwater versus freshwater areas, legal state definitions are used, but these definitions are not mentioned unless requested. Such definitions are also inconsistent among states and do not necessarily reflect a true division between the two areas.

Recommendation: No specific recommendation was offered for resolution of this issue. Perhaps a special studies approach would resolve the issue.

13. Issue - MRFSS Telephone Survey Methodology: Expansion of coastal telephone trip estimates by observed, on-site ratios of coastal/noncoastal residents is a cause for concern with small sample sizes. Some adjustments are made to ratios by pooling historical data when small sample sizes cause extreme estimates of noncoastal resident and nonresident trips.

Recommendation: It may be appropriate for the telephone survey to be conducted in a stratified fashion to allow for sampling for inland and coastal areas. Increased sample sizes through better state-federal cooperation may alleviate the problem.

14. Issue - Subsampling Procedures: The MRFSS procedure for subsampling stipulates that when an interviewer finishes an interview and sees that too many fishermen remain for all to be interviewed, the interviewer should estimate how many can be interviewed, count all remaining fishermen, and then pick the nth fisherman to obtain the number of anticipated interviews. Pragmatically, interviewers most likely move on to the next closest fisherman as they finish an interview.

Recommendation: While no recommendations were offered, this issue should be examined for potential actions for resolution.

15. Issue - Time of Day for Sampling: Rules for specifying time of day to conduct interviews are not specific enough. Interviewing procedures specify that at least one interview per hour should be collected. If activity is too low, the interviewer moves to an alternate site. There is concern about the potential for the introduction of interviewer bias through individual selection of times to begin and end interviewing.

Recommendation: Procedures should be developed to eliminate bias in choosing time of day to conduct interviews. Such procedures should be examined on a small enough frame (eg. seasonal, geographic and/or species oriented) to provide efficiency and consistency, yet assure adequate representation.

16. Issue - Time of Day for Sampling: There are no rules or procedures to specify or eliminate night sampling. The telephone survey estimates include night trips, yet they cannot be identified. This issue should be fully investigated.

Recommendation: The telephone survey should distinguish night and day trips. Night sampling in the on-site survey needs to be addressed when developing time of day sampling procedures.

17. Issue - Combining Telephone and On-site Data: The NMFS assumes that within the MRFSS catch rates are similar between complete and incomplete trips. Studies on freshwater surveys have found no differences between the two, yet there still remains a degree of uncertainty regarding the reliance on incomplete trip interviews.

Recommendation: No consensus was reached on a resolution of this issue; however, it should be investigated and resolved.

18. Issue - Cluster Sampling, Variance Estimates, and Unequal Sampling Probability: This issue is the same as stipulated in Issue 8 above.

Recommendation: Related specifically to periodic statistical review of survey methodologies and procedures, it is recommended that the states and the NMFS investigate the formation of a statistical review committee, possibly under the auspices of the American Statistical Association. A series of projects could be proposed to address identified statistical concerns and to publish the results of reviews and critiques.

19. Issue - Trips by Mode at State Level: It is not clear why state level estimates by mode are not included in annual publications, since such estimates are produced and used by managers. The NMFS MRFSS response is that the survey was designed for regional estimates, and that state estimates by mode may be misleading or inaccurate due to limited sample sizes.

Recommendation: The only agreed upon resolution to this issue is to provide for increased sample sizes through state/federal cooperation.

20. Issue - Validity of Self-reported Data: The accuracy of self-reported data, such as catch not available for examination and length of fishing time are of concern.

Recommendation: Self-reported data should be validated where possible through special studies.

21. Issue - Publication of Texas Data: It is not fully understood why Texas survey data are not included in the annual publication of MRFSS estimates. Data users stated that non-computerized use of Texas data was time

consuming, inefficient and could lead to omissions and/or errors when examining harvest for the entire Gulf of Mexico.

Recommendations: In response to the above issue, Texas responded that publication of Texas data in the MRFSS annual publication could lead to confusion because the two programs provide estimates for different fiscal years. This would result in the publication of two different numbers from the same data base. Also, the NMFS publication is intended to publish MRFSS data, not serve as a clearinghouse for other surveys. Texas has agreed to provide ASCII files of estimates for use in stock assessments and management, with the proviso that results not be published without the approval of the Texas Parks and Wildlife Department and arrangements for joint authorship as stipulated in the GSMFC Policy on Exchange of Data (Appendix 5). It is hoped that greater state-federal cooperation will result in more complete resolution of this issue.

22. Issue - Long Term Improvements in Collection of Recreational Fishery Statistics: This issue is the same as stipulated in Issue 9 above.

Recommendations:

- a. Texas and the NMFS should explore evaluation of the MRFSS and Texas survey estimates to compare for possible bias in estimation procedures.
- b. The MRFSS should incorporate screening procedures in the on-site survey to record recreational shellfish activity for future use in incorporating shellfish estimates. Estimation of recreational shellfish statistics in the MRFSS or associated programs should be addressed.
- c. Investigations into alternate techniques for estimating pressure and participation to increase cost effectiveness and precision should be pursued.
- d. Publication of trend data and analyses of recreational fisheries data should be improved and increased.

INTEGRATION OF STATE/FEDERAL PROGRAMS

Options for Integration

Options for integration of state/federal recreational fishery statistics programs form a spectrum from complete cooperation of all states using exactly the same methodology to all states using their own methodology with aggregation of separate estimates to obtain region-wide estimates. The following are conditions which would be necessary for the States of Louisiana, Mississippi, Alabama, and Florida to consider state involvement with the NMFS to collect and manage recreational fishery data:

- a. an observable commitment by the NMFS to improve the survey as indicated in this document, with quality control being of primary concern,
- b. eventual inclusion of recreational shellfishing in the survey,

- c. a goal of state level estimates with coefficients of variation of 15%-20%, (some states may need estimates for defined areas within the states, such as Florida), and
- d. eventual participation levels such that state personnel conduct the intercept sampling component of the survey.

Integration with the State of Texas is handled separately, due to its existing cooperative agreement with the NMFS to provide recreational landings estimates. The Texas program relies on a survey that began in 1974. The MRFSS and Texas methodologies are similar in some respects; however, estimates of pressure and participation are quite different. The cooperative agreement with the NMFS specifies that Texas provide the NMFS with bimonthly estimates of private-boat, charter boat, and bay headboat landings. Raw data, primarily individual fishing party and length data, are provided for Gulf of Mexico Fishery Management Council management needs upon request, as per the GSMFC Policy on Exchange of Data. A wade/bank survey will be conducted in Texas in 1990-91 and evaluated for permanent staffing. The following are minimum requirements for Texas to fully integrate its survey with the MRFSS:

- a. retention of comparability with previous Texas estimates,
- b. a significant increase in cost-effectiveness to justify disruption of existing programs, and
- c. maintenance of existing precision on a Texas bay system basis.

Texas is receptive to any improvements to existing data collection efforts and improving cooperation whenever possible.

DISCUSSION

The recommendations and actions reported herein are the culmination of a series of workshop sessions sponsored by the GSMFC TCC DMS beginning in February 1989 and running through early 1992. At the time of the first workshop, the only existing MRF surveys were the NMFS MRFSS and the Texas survey. Since that time, Mississippi began and continues to conduct an MRF survey.

The NMFS MRFSS, which began in 1979, experienced level funding through FY1992, when Congress provided additional funds to address the sampling level issue in the NMFS Southeast Region. As of 1990 the Pacific coast was dropped from the MRFSS due to limited funding. During this period, the GSMFC and the Pacific States Marine Fisheries Commission (PSMFC) jointly developed plans for a state-federal MFR data collection and management program called the Recreational Fisheries Information Network (RecFIN). By July 1991, the PSMFC, the Pacific coast states, and the NMFS began the development of a Memorandum of Understanding (MOU) expressing the signatories' intent to establish RecFIN on the Pacific coast. In 1992 a cooperative agreement was signed which established the RecFIN Pacific program, and the MOU signatories are now working toward program implementation. During the Annual Spring Meeting of the GSMFC in 1992, the NMFS Southeast Region proposed a state-federal cooperative MRF data collection and management program for the NMFS Southeast Region. That proposed program, known as RecFIN Southeast, was the direct result of the efforts of the GSMFC TCC DMS and the joint

actions of the GSMFC and the PSMFC and was unanimously endorsed by the GSMFC and its member states. Since that time, a RecFIN Southeast Plan Development Team has been established to develop an MOU and a Strategic Plan for implementation of RecFIN in the Southeast Region. During the 1992 Annual Fall Meeting of the GSMFC, the RecFIN MOU was signed by the Gulf States Directors who subsequently established the membership on the RecFIN Southeast Committee. The newly established RecFIN program will address several of the recommendations identified in this document and will provide a vehicle for the resolution of issues identified herein and others which will eventually arise. It is anticipated that the RecFIN concept will ultimately be endorsed by the mid- and north Atlantic States, thus establishing a National RecFIN program.

Appendix 1

PROCEEDINGS:

**WORKSHOP ON MARINE
RECREATIONAL FISHERIES
STATISTICS COLLECTION IN THE
GULF OF MEXICO**

conducted by the

DATA MANAGEMENT SUBCOMMITTEE

of the

**TECHNICAL COORDINATING COMMITTEE
GULF STATES MARINE FISHERIES COMMISSION**

and the

NATIONAL MARINE FISHERIES SERVICE

EDITED BY

**MAURY OSBORN
and
HENRY LAZAUSKI**

This project was conducted in cooperation with the U.S. Fish and Wildlife Service,
and funded by Federal Aid in Sport Fish Restoration administrative funds
Project No. 14-16-0009-87-1203.



EXECUTIVE SUMMARY

At the November 1988 meeting of the Data Management Subcommittee of the Gulf States Marine Fisheries Commission (GSMFC), the Gulf States and the National Marine Fisheries Service (NMFS) agreed to a three-day workshop with the following goal:

Achieve a cooperative recreational fisheries statistics survey program that provides the best possible data, in the most cost-efficient manner, to satisfy management needs of involved agencies in the Gulf of Mexico.

The workshop was held February 7-9, 1989 at the NMFS Southeast Fisheries Center in Miami, Florida and the following action items were recommended by consensus:

1. MRFSS/State Data Collection Procedures:

- a. Site selection.
 - Explore using historical intercept data to set on-site sampling probabilities.
 - Schedule regular rather than opportunistic site inventory updates.
 - Incorporate new site inventory and allocation procedures in the operations manual.
- b. MRFSS telephone survey methodology.
 - Explore interviewing of self-identified freshwater fishermen fishing in salt water to eliminate harvest underestimation and standardize telephone responses.
- c. Selection of time of day for sampling
 - Develop procedures to eliminate interjection of bias in choosing time of day to conduct interviews.
 - Modify the telephone survey to distinguish between night and day trips.
- d. Quality control.
 - Develop national quality control standards for collection of recreational fishery statistics.
 - Explore methods to improve interviewer training and oversight procedures.
 - Expand and improve operations manuals specifying all procedures and reference the manuals in the RFP for future MRFSS surveys.
 - Publish a technical manual to clarify statistical design and expansions.

2. Expansion and Associated Statistics

- NMFS will compile a list of publications and data files available from the MRFSS.
- NMFS will provide a prioritized list of statistical concerns for resolution.
- Investigate formation of a statistical review committee, under the auspices of the American Statistical Association if possible; propose a series of projects to address statistical concerns and publish the results.
- NMFS will provide copies of correspondence concerning cluster variances.
- Validate self-reported data through special studies.

3. Integration of State/Federal Recreational Fisheries Programs

- a. Interjurisdictional management use of Texas data.
 - Texas will provide computerized files of estimates for use in stock assessments and management, in accordance with Texas proprietary policies.
- b. Integration of Alabama, Florida, Louisiana and Mississippi and MRFSS programs. This will require:
 - observable commitment by NMFS to improve the quality of the MRFSS survey, especially quality control;
 - eventual inclusion of recreational shellfishing; and
 - a goal of state estimates with coefficients of variation of 15-20%.
 - Cooperation should begin with state subcontracts for on-site sampling; long term cooperation should be achieved through cooperative agreements.
- c. Integration of Texas and MRFSS programs.
 - Continue current cooperative agreement on recreational statistics.
 - Direct participation by Texas in the MRFSS would require retention of comparability with previous estimates, a significant increase in cost-effectiveness, and maintenance of existing precision.
- d. Long term improvements in collection of recreational fishery statistics.
 - Investigate improvements to data collection for headboats and charterboats.
 - Explore evaluation of MRFSS and Texas estimates to compare for possible bias in estimation procedures.
 - Begin using screening procedures in the on-site survey to record recreational shellfish activity.
 - Explore alternate techniques for estimating effort and participation to increase cost effectiveness and precision.
 - Conduct a workshop to recommend data elements necessary for management that should be obtained under a recreational fisheries statistics program, including socio-economic data.

- Explore technological advancements to achieve real time data entry.
- Improve and increase publication of trend data and analyses of recreational fisheries data.

4. Final Recommendations

- Expand future Data Management Subcommittee meetings to a full day in order to review progress on action items and update appropriate issues.
- Form a Subcommittee work group to address specific recreational statistical and technical issues.

Appendix 2

**Marine Recreational Fisheries Statistics Survey
Intercept Survey Standards
for Quality Control**



Gulf States Marine Fisheries Commission

March 1991

No. 9-WB

Marine Recreational Fisheries Statistics Survey
Intercept Survey Standards
for Quality Control

Developed By The
Data Management Subcommittee
of the
Technical Coordinating Committee
Gulf States Marine Fisheries Commission

This project was conducted in cooperation with the U.S. Fish and Wildlife Service, and funded by Federal Aid in Sport Fish Restoration administrative funds Project Number 14-16-0009-90-1211.



GULF STATES MARINE FISHERIES COMMISSION

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Introduction

During February 7-9, 1989, the Gulf States Marine Fisheries Commission (GSMFC) Technical Coordinating Committee's Data Management Subcommittee hosted a workshop in Miami, Florida, the purpose of which was to examine state and federal marine recreational fishery data collection programs and make recommendations for improvement. Among many important findings, it was determined that there was no single standardized set of guidelines for quality control for such data collection programs.

Purpose

As part of the 1990 GSMFC Sport Fish Restoration Administrative Program (Wallop-Breaux), the Data Management Subcommittee developed the set of quality control standards described below.

Intercept Survey Standards for Quality Control

1.0 Sampler Qualifications and Experience

- 1.1 Samplers hired must have education or experience in fisheries.
- 1.2 Samplers should have educational background or field experience in identifying fish species.
- 1.3 Samplers should have an aptitude for effectively interviewing people.

2.0 Sampler Testing/Screening for Hiring and Training

- 2.1 Testing to determine qualifications of samplers shall include verification of their ability to identify reasonable numbers of marine fish species expected to be encountered in the area they will sample. The ability to key out unknown fish by means of a marine fish key must be certified. In addition, testing should also determine the ability to successfully interview people in the area to be sampled.
- 2.2 Samplers must be trained in the objectives, goals, and operation of the survey so they can address these issues with anglers in the field.
- 2.3 Samplers must be trained in proper procedures for conducting the interview and coding the intercept form. Fish species codes must

be from the approved code list. Training should also address local names of fish and gear found in the area.

- 2.4 Final testing and training shall be conducted in the field by the sampling supervisor for the area in which the sampler will work.
- 2.5 Testing and training of samplers shall include participation by interested National Marine Fisheries Service (NMFS) and state personnel.

3.0 Standards for the Field Sampler in Conducting the Field Interview

- 3.1 Collect and record accurately and fully all demographic and trip information indicated on the intercept form.
- 3.2 Identify all fish in the anglers' catch to the lowest taxonomic levels possible, preferably genus and species. The only valid species codes are listed on the species code list and must be the only ones used by the sampler.
- 3.3 Samplers must not rely on angler identification of fish under any circumstances except for released fish.
- 3.4 All fish in the anglers' catch will be measured and weighed unless refused by the angler. If necessary, an appropriate aliquot of fish of each species will be selected at random for measuring individual lengths and weights. (Note: Weights may be omitted if length-weight conversions are available to generate the weight from the measured length.)
- 3.5 Fish lengths shall be determined as total length. Total length is defined as: the length as measured from the most anterior tip of the longest jaw to the most posterior tip of the tail. Species for which total length cannot be measured, as specified in the Appendix, will be measured for fork or other length. All length measurements shall be made by means of a measuring board to the nearest millimeter.
- 3.6 Interviews will be conducted at the fishing or landing site at the completion of the fishing trip with the exception of the shore mode. Some shore mode interviews may be conducted on incomplete trips because of the difficulty of intercepting anglers in this mode. These incomplete trips will not comprise more than 20% of the intercepts for this mode in any single wave.
- 3.7 Samplers shall strictly adhere to assignments and follow established alternate site selection procedures.
- 3.8 Samplers will be trained in random sampling and interviewing techniques (including the use of prompts where appropriate) and principles so that decisions on subsampling anglers at high use sites can be properly determined under any special or unusual circumstances (e.g., treatment of charterboats).

- 3.9 Samplers should wear appropriate attire and present themselves in a professional manner.
- 3.10 Samplers shall be responsible for having all equipment on site in a clean and good working order including proper calibration of scales.

4.0 Supervision

- 4.1 Supervision of samplers in the field shall include a minimum of one full-time fishery biologist supervisor for Florida and one for Alabama, Mississippi, and Louisiana. This supervisor shall have a minimum of a B.S./B.A. in fisheries or marine biology and field experience in the subregion he or she will supervise.
- 4.2 The supervisor or other contract personnel will field test and train new samplers in interview protocol, conduct of the interview and fish identification abilities, including the use of a taxonomic identification key.
- 4.3 The supervisor shall review and spot check intercept forms for proper protocol and biology. Audits comparing computerized data to field intercept forms will be conducted to insure an error rate of no more than one half of one percent.
- 4.4 The supervisor will conduct announced or unannounced spot checks of samplers in the field at least twice a year to insure compliance with all procedures.
- 4.5 All supervisors shall maintain coordination and communication with the state fishery agency, state sampling programs, and field personnel. The supervisor should also maintain dialogue with the NMFS regional recreational fisheries coordinators.

5.0 Intercept Forms and Processing

- 5.1 The data collection contractor will edit the data while writing the intercept tape to eliminate any of the following errors:
 - 5.1.1 Unresolved cross-references between record types 1, 2, 3, and 4.
 - 5.1.2 Duplicate identification codes on type 1 records.
 - 5.1.3 Invalid state and county codes for the intercept location.
 - 5.1.4 Invalid fish identification codes (not from the approved species code list).
 - 5.1.5 Missing lengths for type 3 records (must be an actual length or 9-filled indicating a refusal by the angler).
 - 5.1.6 Length values that exceed the maximum length recorded for that particular species.
 - 5.1.7 Improper number of type 2 or 3 records to match with the number of these records indicated on the corresponding type 1 record.
 - 5.1.8 Improper site or area codes.

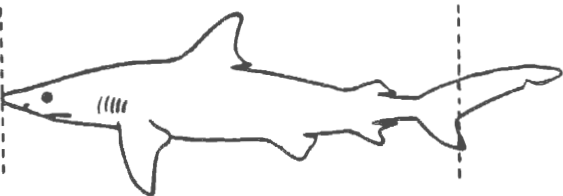
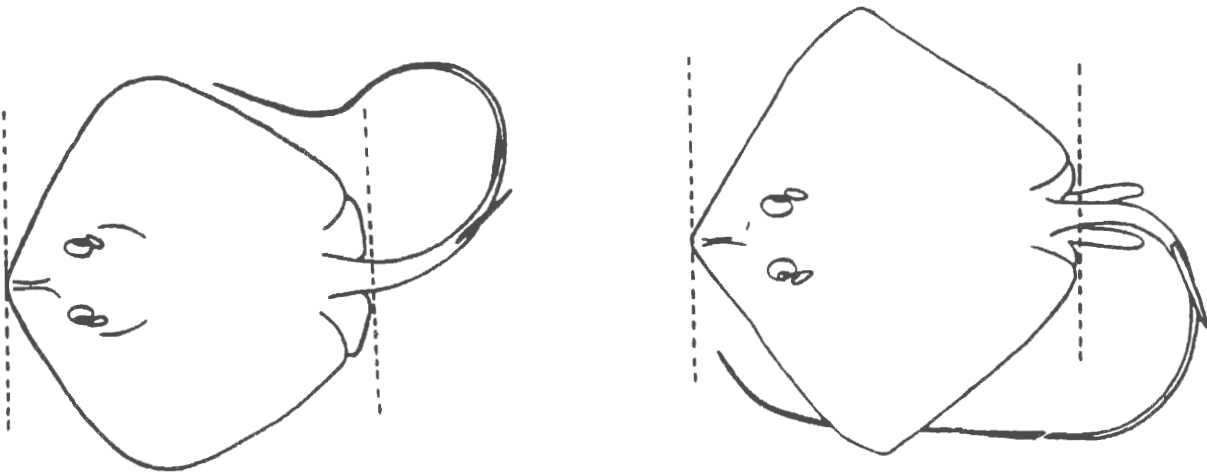
- 5.2 Edit checks should verify that the proper number of type 3 records (measured lengths) exist for the number of fish reported caught on the angler's type 1 record.
- 5.3 The dates reported on each record shall be verified as a valid date for the particular wave in which the interview was conducted.

6.0 Communications and Coordination

- 6.1 The survey contractors, supervisors, and/or administrators, or their appropriate representatives, shall meet twice annually with the Gulf States Marine Fisheries Commission Technical Coordinating Committee's Data Management Subcommittee or their representative along with any other groups or contractors involved in the survey for the region.
- 6.2 These meetings shall provide feedback and communication between the telephone contractors, intercept contractors, supervisors, and committee members.
- 6.3 Follow-up communication shall be made to field personnel where appropriate.
- 6.4 Acceptable performance standards and associated disciplinary actions for samplers shall be developed at these meetings.

Appendix

Table 1. Common name, scientific name, and recommended length measurement of fish species.

Common Name	Scientific Name	Recommended Measurement
Sharks	-	Fork Length
		
Skates and Rays	-	Standard Length
		
Sea Catfish	Ariidae	Fork Length
Bluefish	<u>Pomatomus saltatrix</u>	Fork Length
Herrings	Clupeidae	Fork Length
Sand Perch	<u>Diplectrum formosum</u>	Standard Length
Jacks and Pompanos	Carangidae	Fork Length
Dolphins	Coryphaenidae	Fork Length
Yellowtail Snapper	<u>Ocyurus chrysurus</u>	Fork Length
Mojarras	Gerreidae	Fork Length
Grunts	Pomadasyidae	Fork Length
Bank Sea Bass	<u>Centropristis ocyurus</u>	Standard Length
Rock Sea Bass	<u>Centropristis philadelphica</u>	Standard Length
Barracudas	Sphyraenidae	Fork Length
Tunas and Mackerels	Scombridae	Fork Length

Appendix 3

PROCEEDINGS:

**WORKSHOP ON MARINE "FOR-HIRE"
RECREATIONAL FISHERIES SURVEY METHODOLOGY**

conducted by the

DATA MANAGEMENT SUBCOMMITTEE

of the

**TECHNICAL COORDINATING COMMITTEE
GULF STATES MARINE FISHERIES COMMISSION**

and the

NATIONAL MARINE FISHERIES SERVICE

EDITED BY

MAURY OSBORN

This project was conducted in cooperation with the U.S. Fish and Wildlife Service,
and funded by Federal Aid in Sport Fish Restoration administrative funds, FWS
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EXECUTIVE SUMMARY

I. INTRODUCTION

The Workshop on Recreational Fisheries Statistics Data Collection held February 7-9, 1989, by the Technical Coordinating Committee Data Management Subcommittee (DMS) of the Gulf States Marine Fisheries Commission (GSMFC) identified items for future consideration for long term improvement in the collection of recreational fishery statistics. One such item was the investigation of improvements in data collection for the for-hire fisheries (headboats and charterboats); therefore, a series of workshops was organized for that purpose. Funding for the workshops was provided through the GSMFC by the Sport Fish Restoration Administrative program administered by the U.S. Fish and Wildlife Service. The for-hire fisheries are important components of many fisheries, yet they are not surveyed in most Gulf States intensively enough to produce precise estimates of total harvest and pressure, as well as other essential biological, social and economic data such that assessment of management measures can be accomplished.

II. GOAL

The goal of the workshops was to identify data collection needs, and to recommend the most effective method of obtaining those data for the for-hire fisheries. Recommended methods are for long term, routine, standardized monitoring programs to collect information critical for management. The recommended survey will not accommodate all needs or rare event fisheries, thus data that cannot be collected through routine monitoring programs should be collected through short term special studies.

Methodologies were evaluated in terms of reliability of the data, the types and level of data that could be collected, feasibility, and costs. The recommended survey is intended to capture the range of charterboat effort and landings, and is not intended to target one species or group of species; however, this type of survey should meet the management needs of the majority of managed fisheries.

III. OBJECTIVES

Specific objectives of a routine monitoring program for the for-hire fishery were defined:

- 1) to estimate total daylight gross catch, catch per unit of effort (CPUE) and effort of the for-hire fishery at a sub-state level on a monthly basis with the highest attainable level of precision; and
- 2) to obtain appropriate social and economic data.

IV. RECOMMENDATIONS

A. Rationale for Selection - The advantages and disadvantages of different methodologies were discussed concerning 1) the ability to collect critical information, 2) whether that information is self-reported by the angler or operators or is observed directly by the sampler, 3) presence and types of bias, 4) costs, and 5) procedural difficulties. Five general types of survey methods were discussed: logbooks, onboard observers, roving and access site surveys, telephone surveys, and mail and person-to-person surveys.

Onboard observers were considered the best method in terms of the types and quality of data that can be collected; however, they are the most expensive and in many cases are not feasible. Participants agreed that an access-site survey is the second-best methodology and is more cost-effective than on-board surveys. Telephone, mail and door-to-door surveys were not considered appropriate for a routine monitoring survey of the for-hire fisheries. Logbooks were considered to be a possible method for collection of effort data only, if validation studies are also used; they were not considered adequate for collection of harvest or biological data.

B. Preferred Methods - A complete consensus of all State and Federal representatives was not possible. There was agreement on the "best" methodologies for each component of the "for-hire" fisheries; however, in some cases, State representatives felt that an alternate methodology was more practical and affordable for long-term monitoring in their State.

Guide/Charterboats - The group agreed that the best method of surveying guides and charterboats was through intercept surveys of parties completing their trips, with pressure estimated by either a) roving counts to obtain relative pressures; b) phone surveys of operators, rather than clients; or c) logbooks. In some States, for some segments of the fishery such as guides who launch from their back yard, logbooks were felt to be the only practical method to collect both harvest and pressure data.

Headboats - The preferred method is on-board surveys of fishing trips and a phone census of operators to estimate pressure. If on-board surveys are impossible, access-site intercepts should be used. The consensus was that logbooks should only be used as a last resort due to the unreliability of self-reported data.

C. Scope - Surveys should produce daylight estimates only, since night fishing is a small component and is logistically too difficult to survey. Sample sizes should be chosen to accommodate monthly estimates to satisfy current management strategies based on quotas. Access points where on-site surveys should be conducted include public and private boat ramps, marinas and dry storage boat-houses. Shorefront residences with private boathouses, docks or launch areas could not be included in a cost-efficient manner. Wade/bank access points are not applicable to the for-hire fishery. Tournament anglers should not be included in the survey, or information for tournament anglers should be kept in a distinct category. Historical data should be used to decide whether to stratify the fishery and to select the best intercept times.

D. Essential data elements - Essential data elements to be collected include gross catch; number by species released alive and dead, and the reason for releases; lengths of landed fish; weights for specified species; sex; trip and fishing time; fishing area; gear and bait used; fishing method (trolling, bottom fishing, etc.); geographic residence of the anglers; species targeted; motivation and satisfaction; travel and fishing trip costs; years fished (experience); number of for-hire trips made; precipitation, and; water depth and bottom type of the fishing area. It is recommended that a common set of definitions and codes be developed by the States and NMFS for these data items to ensure comparability of the data.

E. Special studies - Special studies will be needed on periodic, short-term bases to a) collect data elements essential to good fisheries management but that can not be practically collected by the proposed survey, and b) to identify and quantify gaps in the sampling frame so that estimates can be adjusted to represent total harvest and pressure.

Appendix 4

Excerpt From
TCC Data Management Subcommittee Minutes
April 16, 1991
Galveston, Texas

Demonstration of Electronic Field Devices

The demonstration consisted of three vendors; Tandy Corp., Radix Corp. and Limnoterra. The presentations started at approximately 1:30 p.m. with Radix first, followed by Tandy and then Limnoterra.

The Radix representative showed that it's device, a brick size data logger, was water proof by submerging it in a tray of water. He indicated that it was rugged by tossing it around the room a couple of times. This data logger is programmable in three high level languages; BASIC, C and PASCAL. It appeared to have many uses such as field data collection, creel surveys, monitoring and assessment and mariculture work. The device ran off AAA batteries and was alleged to float. The computer file in the device was down-loadable to microcomputers via the serial port.

The Tandy representatives had a grid pad device that had application in the area of forms use. The entire form or any part of it was displayed on a flat screen. The device could read some types of script written with a special pen on the screen. The device was not water proof with the possible exception of the screen itself. The grid pad has applicability in an office where the same types of forms are used over and over again such as in license sales. Files were down-loadable to microcomputers via the serial port.

The Limnoterra representatives demonstrated a programmable fish measuring board. Scales, calipers and computers could be attached to this device. Special vendor generated software was an optional purchase to allow for on-the-spot data readouts and analysis. Data other than the length was programmable for each observation such as; was an otolith taken?, sex, ovary sample taken? and other bionic and abiotic information. The device was rugged and water proof. Species coding could be a problem when a large number of species were encountered. This board appears to have both field and laboratory applications especially in high volume work.

Appendix 5

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Gulf States Marine Fisheries Commission

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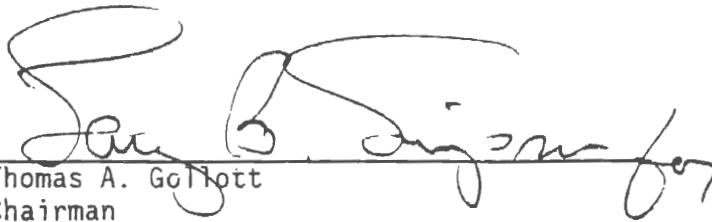
POLICY ON EXCHANGE OF DATA

At its 40th Annual Fall Meeting in Biloxi, Mississippi during October 16-20, 1989, the Gulf States Marine Fisheries Commission, through its TCC Data Management Subcommittee, fully reviewed a series of issues surrounding the proprietary nature of data which has been collected by state and federal fisheries agencies. The Gulf States Marine Fisheries Commission has concluded that as a minimum effort, to maintain the high quality of professionalism required by fisheries researchers and managers, the following items should be strictly adhered to when using borrowed data for analysis and/or publication:

- 1) Full acknowledgement of the agency from which the data originates, and
- 2) Provisions to allow the agency from which the data originates the opportunity to critically review any document slated for publication prior to peer review.

These are considered to be minimum measures which should be agreed to by both the agency and the requestor.

Given this the 19th day of October in the year of Our Lord, One Thousand, Nine Hundred, Eighty-Nine.


Thomas A. Gollott
Chairman

- Member States -

Texas

Louisiana

Mississippi

Alabama

Florida

