

**REVIEW FINDINGS OF THE  
THE ACCSP FOR-HIRE PILOT STUDY**

**January 8, 2002**

## **Context of the Review**

On March 1, 2000, the Recreational Technical Committee of the Atlantic Coast Cooperative Statistics Program (ACCSP) began a one-year assessment (as a pilot study) of three programs designed to measure the fishing activity of the for-hire sector (commonly referred to as charter and party/head boats) of the South Carolina marine fishery. The three programs being assessed were the:

- Marine Recreational Fishery Statistics Survey (MRFSS) that had been in place since 1979 for the entire Atlantic coast;
- South Carolina mandatory Charter Logbook Program initiated in 1992 combined with the National Marine Fisheries Service (NMFS) headboat logbook survey in place since 1986, and;
- NMFS Vessel Directory Telephone Survey (VDTS) combined with the MRFSS intercept component (with augmented sampling) designed specifically for this assessment project.

The purpose of this pilot study was to provide information for determining the best acceptable method of collecting data from the for-hire segment that could be adopted as a standard for the ACCSP program.

On December 4-5, 2001 a review team selected by the Marine Fisheries Section, American Fisheries Society, was assembled to assess these programs for sampling for-hire fisheries on the Atlantic coast (see Appendix I for reviewers). Approximately one week prior to this, the reviewers were provided with extensive documentation of the programs and comparative results compiled during the one-year assessment period (see Appendix I for format and agenda).

## **General Findings**

### **Marine Recreational Fishery Statistics Survey (MRFSS)**

The MRFSS was initiated in 1979 to provide estimates of the impact of marine recreational fishing on marine resources nationally. The MRFSS is comprised of a telephone survey of coastal households to obtain marine recreational fishing trips by mode of fishing, and an intercept survey of anglers to collect data on catch per unit effort and species composition. The complimentary sampling surveys together produce estimates of total recreational catch, effort, and angler participation. Only the component dealing with charter and headboat operators was assessed in the pilot study. As designed and executed, the accuracy and precision of the MRFSS is best when applied to broad geographic areas (e.g., coast wide) and categories (e.g., “recreational anglers”), and across the entire fishing season. Because of limitations related to the level of sampling, the reliability of the MRFSS estimates of catch and effort statistics diminishes when applied to sub-populations of the total fishing activity, whether subunits are geographic, user group, or time blocks. Thus, applying the typical MRFSS to assess a single user group (e.g., for-hire fisheries) in a single state (e.g., South Carolina) is unreliable because of small sample sizes in the intercept surveys and inadequacies of the sampling frame. This problem is exacerbated by the smaller number of anglers in the for-hire fisheries relative to the total number of marine recreational anglers. The low probability of reaching an angler in the Coastal Household Telephone Survey (CHTS) who participated in a for-hire fishing trip becomes

problematic. Although the CHTS uses highly sophisticated survey sampling and estimation techniques, it also suffers from poor performance because of deficiencies in the sampling frame (~80% of the anglers in South Carolina for-hire fisheries are not “coastal residents”).

As presented, the review team finds the current MRFSS approach for estimating the catch and effort of for-hire fisheries to be inadequate because of shortfalls in the sampling frame used for the effort survey and because of its poor ability to capture the for-hire activity in space and time. The tenuous nature of the data for this purpose was in fact the driving force behind this assessment of alternate for-hire sampling programs. Therefore, for the purposes of this report, further discussion of this methodology for assessing the for-hire fisheries would not be useful and is not provided.

### South Carolina Mandatory Charter Logbook/NMFS Headboat Logbook System

The South Carolina mandatory logbook system was implemented in 1992. Three crucial features of the system contribute to its reliability:

- It is *mandatory*, meaning that every for-hire operator in the state must submit logbooks on a monthly basis. It is a condition of being licensed to operate a for-hire vessel in South Carolina waters.
- It is *enforceable*. Failure to submit logbooks can result in citations and civil penalties. Staff monitors the submission of logbooks and notifies delinquent operators in a timely fashion so that inadvertent lapses in submissions are rectified as soon as possible.
- It is financially sustainable. Implementation of a saltwater fishing license for anglers and an annual permit for charter and head boats operating in state waters provides a source of revenue to sustain the program.

Based on the assessment results presented to us, the logbook system provides an adequate framework for characterizing the effort and catch (numbers by species) of for-hire fisheries. However, the lack of dockside sampling in the *charter* logbook component precludes the use of this system from providing adequate biological data such as lengths, weights, etc. that are typically collected as part of a dockside interview process.

Henceforth, the term “logbook system” is understood to mean the combined program of the South Carolina Mandatory Charter Logbook system and the NMFS Headboat Logbook system unless otherwise stated.

#### Advantages

*Stakeholder Acceptance* - Based on arguments regarding appropriate methodology for the U.S. Census in 2000, a census of boats to collect data on catch and effort is likely to have more credibility with stakeholders in the recreational fishing community than a methodology that relies on probability-based survey sampling. Specific to Atlantic coast fisheries, outreach efforts conducted for the ACCSP with recreational and charter fishing constituents along the Atlantic coast indicated a strong desire to participate more actively in data collection than is currently allowed in the MRFSS program (Loftus et al. 1999). This would seem to indicate that a program

that directly engages stakeholders (i.e., for-hire operators in this case) in data collection would offer greater perceived credibility than a statistical sampling program. Sound credibility has many potential advantages, including improved political support for the program and better cooperation in the collection of accurate data.

The logbook system appears to be well institutionalized in South Carolina. Compliance problems are dealt with quickly and effectively. According to respondents to the recent ACCSP survey of charter and head boat operators, there appears to be support for the logbook system as currently configured in South Carolina (Anonymous 2001). The full extent of support among the population of charter and head boat operators remains uncertain at this point.

*Sampling Frame and Data Coverage* - The logbook system provides good coverage of the charter and head boat fleets and their fishing activities over time. The census of head boats is more complete than that of charter boats and covers approximately 99% of the trips. In addition, the logbook system provides good temporal coverage of fishing activity. Catch data from trips completed at any time of the day or night can be reported in the captain's logbook. Additionally, logbooks are an effective means for collecting data on "rare events" (i.e., billfish caught and released) in the charter and head boat fishery. Data collection for catch information is accurate except for the number and species of fish returned dead/ alive (discards). This is particularly a problem on head boats where the number of anglers and number of fish caught are greater than can be readily observed.

*Timeliness of Data* - Data are available in a timely manner relative to other sampling programs. Logbook data are submitted and processed within 45 days after the end of each month, meaning that complete data sets for the previous year (January- December) are available approximately 45 days into a new year. Logbook systems could easily be adopted for basic in-season monitoring of the fisheries (see discussion on improvements).

*Administration* - The logbook approach taken with *mandatory licensing* appear more self-contained at the state level and hence more manageable than an approach where one must develop and maintain a vessel directory and rely on the MRFSS access-point intercept survey. A vessel directory based on a mandatory charter and head boat *license* is likely to be more complete than a directory of for-hire vessels developed from scratch and maintained on a time-available basis.

### Disadvantages

*Sampling Frame and Data Coverage* -The sampling frame of charter and head boats accomplished through mandatory reporting is nevertheless incomplete since rogue/ bandit boats operate without a charter boat license and out-of-state boats (that should be licensed in South Carolina but may not be) are not included. The extent of this source of under reporting is unknown. Further, while the logbook system is intended to be a census of all fishing trips conducted by all active for-hire boats, there is an approximate 23% level of underreporting of charter boat trips.

*Statistical Analysis* – As currently conducted and analyzed, the logbook system is treated as a complete census of activity. Under this assumption, no sampling error is associated with the estimates. However, it is known that under reporting of trips does occur, that catch data (species caught, number released, etc.) may not always be 100% accurate and that other variations in reporting likely occur. Because the distribution of such errors is unknown, it is not possible to quantify the magnitude of the resulting uncertainty in the catch and effort estimates.

*Administration* - In states other than South Carolina, implementation of a logbook system would require a licensing system and mandatory reporting to ensure full compliance by licensed boats. This review cannot ascertain the feasibility of that occurring, but it should be a consideration in deliberations regarding the implementation of a system such as this for other Atlantic coast states.

#### No advantage one way or another

Logbooks can have the same problems with recall bias as the VDTS system if trip reports are not completed during or immediately following each trip. Outreach efforts with charter and head boats should continue and be expanded to focus on the problematic aspects of this form of data collection in order to improve the accuracy of data collection.

The mandatory compliance aspect of the logbook system is a two-edged sword. It seeks to keep boat operators in strict compliance but reinforces the idea that fishery management is top down rather than a partnership between the public and private sectors.

#### Ways to improve on the logbook system

Outreach efforts need to be greatly expanded to 1) make it clear why a logbook system is in operators' best interests and, 2) focus on particular issues like recall bias and species identification. Hopefully, this will improve data quality and reduce the number of missed trips.

Law enforcement efforts need to focus on finding illegal boats operating on a for-fee basis and get them to either purchase licenses so they can participate in the logbook system or cease their illegal activity.

Support within the industry will be enhanced in the future if new technologies are used to make online reporting of data immediately after each trip possible. A logbook system may lend itself to automated reporting (kiosks at marinas, personal computers etc.) better than other systems. Anything that helps to reduce recall bias for charter trips and makes data collection more user friendly should be encouraged. Further, a logbook system could be adapted to provide a useful “business tool” for charter captains and potentially thereby increase accuracy and compliance by the users.

The review team believes that the accuracy of the data could be improved in several ways. On-board observers are essential, particularly on head boats, to collect accurate data on the species and number of discards. As mentioned previously, the logbook system (as it was presented to the review team) does not currently provide biological data on the catch. Implementing dockside

sampling to gather biological data would greatly enhance the applicability of this program. In addition, the logbook accuracy could be improved by implementing an enhanced verification/validation component to ascertain the degree of misreporting of trips. As this component was presented to the review team, a number of holes in the procedure (time of day coverage, etc.) bring into question the strength of the results of the validation program.

### Vessel Directory Telephone Survey (VDTS)/Access Point Intercept Survey

The third component of the pilot study involved a Vessel Directory Telephone Survey (VDTS) in conjunction with the MRFSS access point survey (with enhanced coverage) to estimate angler catch (the total number of fish caught, including the ones released), harvest (the number of fish kept), and catch and harvest per unit effort. The VDTS was used as an alternative to the traditional Coastal Household Telephone Survey to provide estimates of effort for the charter boat and headboat fisheries, with the unit of effort being individual fishing trips. The access point survey is an on-site intercept design where interviewers collect information on the catch per trip from anglers after they have completed their fishing trips (Pollock et al. 1994). The method is suitable for the charter boat and headboat fishery in South Carolina because most of the vessels use identifiable (primarily public) access sites to enter the fishery. The primary objective of the access point survey is to collect data on catch and composition that are representative for all access points over time (monthly, and the entire fishing season). The catch per unit effort (CPUE), by species or overall, is then expanded to the total effort (as estimated by the VDTS) to obtain estimates of total catch by wave or for the entire fishing season.

#### Strengths of the VDTS/Intercept approach

The catch per unit effort and total catch estimates from the VDTS/Intercept survey closely matched the corresponding logbook estimates for many common species, and provided yearly estimates of total catch and effort that are comparable to the logbook estimates. The proportional standard errors in the estimates were quantified (under certain assumptions), indicating adequate precision for the monitoring of yearly catches for most common species.

*Burden* -An advantage of the sampling approach, as compared to a logbook approach, for monitoring the for-hire fisheries is that the time commitment to the industry is reduced. The observations of only a small subset of all trips can potentially result in lower non-response rates and increased reporting accuracy.

*Sampling Frame and Data Coverage* - The sampling frame for the VDTS as implemented in the pilot study was based on a relatively complete list of participating charter and headboats. The initial list of active boats was based on the directory of licensed charter and headboats provided by the licensing mechanism enforced by the South Carolina Department of Natural Resources, but was updated throughout the study to maintain an accurate sampling frame over time. We consider this sampling frame to be near optimal and expect that significant further improvements might not be achieved within an acceptable cost.

The sampling for the VDTS was stratified to achieve broad spatial and temporal coverage of the fishery, and to cover the range of boats with respect to their size. We believe that the VDTS

provides reliable estimates of effort because of the 1) effective study design, 2) near complete sampling frame, 3) relatively large sample sizes, and 4) very favorable response rates in the telephone interviews (70-90%).

Substantial reduction in bias and increased precision in the estimates of effort was achieved relative to the traditional MRFSS coastal household telephone survey.

The access point survey provides information on catch and harvest per unit effort by species, as well as information on the size structure and weight of the harvest of selected species. Information on effort from the intercept survey is also used to adjust for under-coverage in the VDTS sampling frame, and to update the sampling frame for the VDTS by tracking boats that enter or leave the fishery during a sampling wave. An advantage of the access point intercept survey is that it is already established along the East coast, and in other states.

#### Weaknesses of the VDTS/Intercept survey

The VDTS/Intercept survey as implemented in the pilot study has some deficiencies that, if corrected, would substantially improve the reliability and utility to fisheries managers.

*Credibility* -It will likely take some time for charter and head boat operators to have confidence in data provided through a probability-based sampling process. Without a background in survey sampling, operators will probably be skeptical of the resultant data. At least with a logbook program, operators have “some idea of what is missing.” These perceptual problems currently plague the MRFSS program and focused, comprehensive, and ongoing outreach activities will be needed to overcome this type of thinking.

*Timeliness of the data* - The survey’s poor ability to provide timely estimates that could be used for in-season management of the fisheries as compared to the logbook approach is of concern. Final yearly estimates of catch and effort are not available until at least 5 months after the end of the year. In the past, this delay in the MRFSS data has presented difficulties to managers as they formulate management measures for the following year. Much of this delay is due to QA/QC procedures (which should be commended) but means to reduce the time required for this should be explored.

*Sampling Frame and Data Coverage* - The survey appeared to provide poor estimates for some important species because of bias in the spatial coverage, and does not capture rare events (i.e. does not provide reliable estimates of the catches and occurrences of rare or highly patchy species). In common with the other programs for sampling the for-hire fisheries, the survey provided poor estimates of the number of released fish (dead or alive) because of recall bias, and because anglers may not accurately identify the species of fish that were released or used for bait.

In the intercept survey conducted in the pilot study, a sampling approach that allocated more sampling effort to access points with historic high utilization and catch levels was used to select primary sampling units (PSUs). This was achieved through a type of probability-proportional-to-size (pps) sampling scheme (Cochran 1977). The two-stage sample selection employed in the

intercept survey resulted in less than optimal spatial distribution of sampling effort because of the clustering of sampling days within selected access points. The allocation of sampling effort among access points based on fishing pressure can be cost effective and statistically efficient. However, the lack of geographic stratification from north to south in the pilot study and over-sampling of sites with high fishing pressure resulted in poor spatial coverage of access points, with particularly low sampling frequency in the southern part of the state. This selection bias was magnified because, as we understand from the presentation, the contractor that conducted the access point intercept survey did not strictly follow the sampling plan; i.e., the contractor failed to conduct interviews at some selected access points with low fishing pressure. The payment by number of angler interviews conducted by the contractor appears to be an incentive to avoid sites with low fishing pressure, which thereby introduces bias.

The non-equal inclusion probabilities for access points (and fishing days within these access points) were not adjusted for in the estimation of CPUE. This would further bias the CPUE estimates if the assumption of equal catch rates and species composition for low pressure and high pressure access points does not hold. The CPUE of black seas bass, for example, was apparently underestimated because of the over sampling of some access points, and the under-sampling of southern access sites apparently overestimated the CPUE of king mackerel.

Another potential source of bias in the estimates of CPUE by species relates to the lack of coverage of night fishing. Boats that complete their trips at night are not intercepted, partly because of safety concerns. If the species composition of the catches significantly differs between day and night trips, the extrapolation of the CPUE from the daytime intercepts to the total effort would introduce bias in the estimates of total catch by species.

### Recommendations for improvements

The reliability and utility of the VDTS/Intercept survey can be improved with minimal increase in cost by increasing the spatial coverage. We note that unbiased estimates of total catch and effort for the entire fishery with associated measures of proportional standard errors (PSE) can only be achieved if all access points are 1) included in the spatio-temporal sampling frame, and 2) have a known probability of selection that is greater than 0.

A third requirement, i.e., that any pair of two PSUs have a known inclusion probability greater than zero, is also required to provide unbiased estimates. When all three requirements are fulfilled, the Horvitz-Thompson estimator (Cochran 1977) can be used to obtain unbiased estimates of the CPUEs and the associated standard errors. Thus, the sampling of access points over time should be selected with known probabilities, and estimators of CPUE should apply sample weights (based on the inclusion probabilities) that produce unbiased estimates. Appropriate weighting is essential when there are large differences in inclusion probabilities, as is the case when sampling frequency is proportional to the historic fishing activity level of each access point.

Taking travel cost into account, it is desirable to spread out the intercepts across access points and days. Basically, the sampling frame for the access point survey consists of a matrix with days as columns and access points as rows. This matrix forms the spatio-temporal sampling

frame, with primary sampling units (PSUs) being the combination of all of the times (days, part days) available for fishing by the charter boat and headboats during a defined period (sampling wave) and all points of access to the fishery (Pollock et al. 1994). A stratified random selection of PSUs should be considered to ensure broad geographic coverage from north to south, as well as good temporal coverage. The continued use of higher inclusion probabilities for access points with historic high fishing pressure is recommended. However, a sample selection that avoids the clustering of days within access sites, as introduced in the two-stage selection employed in the pilot study, could substantially increase the spatial coverage of the intercept interviews. This could be achieved by the selection of PSUs that are cells in the matrix of sites and days. Such improved coverage of fishing trips in time and space, combined with the use of appropriate sample weights (based on the inclusion probabilities) when estimating CPUE could result in more reliable estimates for less common species, and for species that concentrate in certain parts of the fishing ground, such as king mackerel and black sea bass.

The inclusion of access points with low utilization rates in the sampling frame pose a particular challenge when optimizing the distribution of sampling effort across time. A bus-route access survey (Pollock et al. 1994) should be considered for sampling access points with low historic utilization rates. These sites could be designated as a separate stratum (within each of the primary spatial strata) with low sampling intensity, or they could be grouped into primary sampling units that can be sampled with low inclusion probabilities. This scheduling of daily sampling of access points could significantly reduce waiting time on the part of the interviewers, and could improve the precision in catch estimates for a fixed survey cost.

Access points with low utilization rates may also be considered non-preferred access points (Goodman and Kish 1950). The use of controlled simple random sampling without replacement (Avadhani and Sukhatme 1973) could be used as a means of reducing the chance of including non-preferred access points in the sample selection. Such selection from a complete sampling frame can yield unbiased estimates, and is an alternative to the elimination of many non-preferred access points from the frame.

Using data from the pilot study, it is also recommended that the optimal distribution of sampling effort (i.e, the strategy that results in minimum PSE for a fixed total survey cost) between the VDTS and the intercept survey be identified.

### **Comparison of the VDTS/Intercept and the Logbook Systems**

To aid in the comparison of the VDTS/Intercept system and the Logbook system, the review team crated a matrix of the criteria that we were requested to specifically address. Two scores were assigned for each category in each system: a score reflective of the process or results from the pilot study as conducted and a score for the *potential* if identified deficiencies were corrected. Each criterion was weighted equally with the exception of “ability to capture rare events” which was weighted at 1/3 the level of the others. The review team felt that even though knowledge of rare event occurrences may be important to managers, it was not on the same scale of importance in a program intended to *quantitatively* measure effort and catch for management purposes. It should be noted that “cost efficiency” was removed from the list as originally presented since the review team felt that data were insufficient to assess the costs and benefits of each system in a

comparable manner. This item is addressed in a separate section of this report. The matrix with assigned scores is presented in Appendix II.

It is readily apparent from the matrix that no system stands out as a clear choice. Both provide reasonably sufficient and reliable means for assessing the fisheries *as currently implemented in South Carolina*. However, both systems have deficiencies that, if corrected, would substantially improve their reliability and utility to fisheries managers.

Both systems share a number of common features:

- Both the VDTS and Logbook require an *enforceable* mechanism to register operators in order to ensure that the most accurate listing of for-hire operators is used as a sampling universe. Either system requires substantial state buy-in (a boat license with enforcement) to provide this list.
- It is likely that the accuracy of the VDTS interviews benefited from a simultaneous logbook program. During the telephone surveys, some of the for-hire operators referred directly to their logbooks in detailing their trips.
- Any system should strive to capture the universe of “for hire” activity, including the “rogue” operators who operate illegally without required licenses and permits.
- It is doubtful that either system accurately captures “discards, particularly “live” or “dead” categories. Observer coverage would be required to accurately measure discards (particularly on head boats) and continued use of the categories of “live” or “dead” should be seriously reconsidered.
- Regardless of which system is used, implementation will require initial and ongoing outreach by professionals. This should be an essential component of the program from the outset.

### Comparison of Costs

Only a very general comparison of costs is possible with the information provided, particularly when attempting to extrapolate the costs associated with the pilot study in South Carolina to a fully implemented system among all thirteen Atlantic states. One contributing factor is the differences in accounting practices between agencies. The fact that this was a pilot study also complicates the extrapolation since costs for such studies tend to be higher due to start-up costs, etc. Additionally, it appears that “cost comparison” was not incorporated into the initial study design and, as a result, agencies did not track precisely the personnel costs specific to the pilot study. Therefore, the estimates provided below and found in Appendix III are only meant to be used for the most general comparative purposes.

The NMFS estimates that the costs associated with the VDTS and intercept component as conducted in South Carolina to be \$98,192. The South Carolina DNR and NMFS Beaufort Lab estimate that costs for the logbook, a dockside sampling program designed to collect a comparable number of fish lengths as the MRFSS intercept, and headboat survey to be \$87,224. Some of the costs estimates (such as for the NMFS headboat survey) included “supervisory” components whereas the costs for the VDTS component included only costs directly related to implementation (QA/QC for NMFS personnel but no NMFS supervisory personnel costs). For

purposes of this review, the review team felt that given the uncertainty in the comparability of these estimates, the costs of these programs could not be considered significantly different.

In addition to these costs, several other costs can be anticipated but were not used in these rough comparisons although they were provided by the participating agencies. The cost for outreach could not accurately be determined due to incomplete information. The costs for the validation component (\$50,386 as estimated by the South Carolina DNR) would be incurred in either the VDTS/intercept program or the logbook program. And, the cost for start-up of the logbook program (\$20,242) was not included since comparable costs did not appear to be included in the NMFS estimates even though it is likely that start-up and design costs were incurred.

As tenuous as the cost comparison is for the South Carolina pilot study, comparability of the costs for a coastwide program is even more uncertain. For example, the NMFS estimates that a cost per dockside interview is \$52.23 based on existing contractor charges. The South Carolina estimate for a dockside interview is less than half of that (\$23.71) and is based on an ongoing survey of similar nature in their state. It is therefore beyond the scope of this review to provide advice specific to the comparable costs of coastwide implementation of these programs. An outside independent audit conducted by specialists skilled in comparing costs between government programs is necessary to obtain this information.

The review team advises that any consideration by the ACCSP regarding a sampling program should include two crucial evaluations that cannot be assessed as part of this review process:

- 1) If cost becomes a major deciding factor beyond the discussion provide here, it is recommended that ACCSP obtain an independent, professional assessment by financial professionals familiar with assessments of government programs prior to any final decisions regarding adoption of a system.
- 2) ACCSP should carefully evaluate the realistic feasibility that each partner would implement an *enforceable* logbook reporting mechanism for the for-hire fisheries. Implementation of a logbook system that did not yield the benefits shown in South Carolina would not be a positive step forward. Furthermore, the results using the VDTS approach would only be as good as the vessel directory underlying the system. Therefore, a mechanism and funding would need to be in place to maintain, on a real-time basis, the necessary list of for-hire vessels that provide the sampling universe for VDTS.

## **Recommendations**

Recognizing that the ultimate goal of the ACCSP is to establish a standard system for adoption by all ACCSP partners, the review team debated the merits of implementing each system on a coastwide basis. The review team finds sufficient conditional support for implementation of a modified VDTS-type of system on a coastwide basis for three main reasons. First, a coastwide sampling program conducted by many independent partners requires consistency among all entities being sampled. As was evident in the South Carolina logbook system, there was under reporting of trips and possibly of other variables, but the degree (error) of such under reporting could not be statistically measured. It can be expected that with sampling by thirteen states,

similar systematic errors will occur to varying degrees in each state. Without error estimates to allow for bias correction or the estimation of confidence intervals, combining or comparing the results from different states may be problematic. Second, the logbook system as currently implemented does not provide the biological data that the intercept portion of the VDTS system does. Assuming that these data are valuable to managers, the absence of this component would be a significant drawback to the logbook system as a standard. Third, we do not foresee all ACCSP partners (state agencies) implementing sufficient mechanisms to maintain a comprehensive, accurate, and up-to-date “register” of their for-hire boats *and* implementing mandatory/enforceable reporting mechanisms. These were crucial components leading to the success of the logbook system in South Carolina. Pursuing a logbook system in the absence of this mechanism would undermine many of the advantages that put it on parity with the VDTS in South Carolina. We do not believe that an effective and reliable logbook system can be put in place without a boat license as currently implemented in South Carolina.

It should also be reemphasized that adoption of the VDTS/intercept methodology should be accompanied by actions to correct the deficiencies identified in this review. This includes the adoption of a substantial outreach program to improve the acceptability/credibility of sampling methodology with constituents and improving sampling coverage to capture all significant fishing activity (night time fishing, etc.). Also, the level of intercept sampling was purposefully boosted in the pilot study. This significantly improved the spatial and temporal coverage of this component. Our support of the VDTS/Intercept survey as an ACCSP standard would be contingent upon achieving a sample size and level of coverage that provide estimates of catch and effort that are sufficiently accurate for the management of fisheries in other states. The required precision, which depends more on sample size than the actual sampling fraction, may vary between states.

### **Acknowledgements**

The review team would like to express our appreciation for the efforts made by the ACCSP subcommittee responsible for drafting the materials describing the alternative methods and respective results for our review. We also very much appreciate the time commitment that subcommittee members made to participating in the review and for the responsiveness of Joe Moran and Bill Whitmore to our many questions and follow-up requests.

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## **APPENDIX I**

### **REVIEWERS AND REVIEW FORMAT**

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### **REVIEW FORMAT**

#### December 4, 2001

1. Welcome and Introductions - Bill Whitmore  
(brief explanation of Review format)
2. Presentations – Methods and Results
  - South Carolina Charter Vessel Logbook – Wayne Waltz
  - NMFS Beaufort Headboat Survey – Bob Dixon
  - MRFSS Charter Boat Mode - Dave Van Voorhees
  - Charter Captain Telephone Methodology  
Validation
3. Attitude Survey - Wayne Waltz
4. Panel Questions

#### December 5, 2001

1. Reconvene Subcommittee as necessary, at the pleasure of the Panel
2. Panel Discussion and Generation of Consensus Recommendations
3. Adjourn

### **ACCSP PARTNERS PRESENT**

Bill Whitmore (chair), Delaware Division of Fish & Wildlife

Nan Jenkins, South Carolina Department of Natural Resources, Marine Resources Division

Bob Dixon, National Marine Fisheries Service, Beaufort, North Carolina

Tom Sminkey, National Marine Fisheries Service, Marine Recreational Fishery Statistics Program

Bryan Stone, South Carolina Department of Natural Resources, Marine Resources Division

Dave VanVoorhees, National Marine Fisheries Service, Marine Recreational Fishery Statistics Program

Wayne Waltz, South Carolina Department of Natural Resources, Marine Resources Division  
*Staff*

Joe Moran, Atlantic Coast Cooperative Statistics Program Coordinator

Jeff Brust, Atlantic States Marine Fisheries Commission Staff

## APPENDIX II

### CRITERIA EVALUATION MATRIX

	<u>Weight</u>	<u>Logbook</u>		<u>VDTS/Intercept</u>	
		<u>Current</u>	<u>Potential</u>	<u>Current</u>	<u>Potential</u>
Ability to Capture For-Hire Activity (spatial and temporal)	3	3.7	3.7	3.0	3.5
Data Quality	3	3.0	3.5	2.5	3.5
Bias					
coverage (spatial and temporal)	3	3.5	3.5	2.5	3.0
non-response (trips)	3	3.0	3.1	3.2	3.5
reporting accuracy (catch)	3	2.5	2.7	3.5	3.5
Industry Burden					
time commitment	3	2.5	2.5	3.0	3.5
Perceived burden	3	2.5	3.0	2.5	3.0
Capture of Rare Events	1	3.5	3.5	1.3	1.5
Credibility of Data (with the industry)	3	3.5	3.5	2.5	3.4
Yearly Dataset availability (4 = sooner, 1=later)	3	3.0	3.0	1.0	3.0
<b>TOTAL SCORE</b>		85.0	89.0	72.3	91.2
<b>AVERAGE SCORE</b>		3.0	3.2	2.6	3.3

Unweighted scores range from 1 (poor) to 4 (excellent)

## APPENDIX III PROGRAM COST INFORMATION

### SOUTH CAROLINA LOGBOOK SYSTEM

Provided by Nan C. Jenkins, South Carolina Dept. of Natural Resources, December 19, 2001.

Labor	Key entry= $(\$7.39 + 2.07) \times 630$	\$5,960
	Coding/proofing = $(\$25.08 + 7.02) \times 450$	\$14,445
	Compliance tracking = $(\$7.39 + 2.07) \times 432$	\$4,087
	Compliance enforcement = $(10.27 + 2.88) \times 360 \times 4$ officers	\$18,936
	<b>TOTAL</b>	<b>\$43,428</b>
Overhead	18.48% of salaries (\$33,923)	\$6,269
	<b>TOTAL</b>	<b>\$6,269</b>
Travel	800 miles x 34.5	\$276
	<b>TOTAL</b>	<b>\$276</b>
Project Costs		
	Printing	
	Charter log	\$1,750
	Head log	\$981
	Supplies	
	Envelopes	\$70
	Paper	\$10
	Postage	\$1,864
	<b>TOTAL</b>	<b>\$4,675</b>
	<b>GRAND TOTAL</b>	<b>\$54,648</b>

**ESTIMATED COSTS FOR SOUTH CAROLINA BIOLOGICAL SAMPLING  
(DOCKSIDE INTERVIEWS)**

Provided by Nan C. Jenkins, South Carolina Dept. of Natural Resources, December 19, 2001.

SFS = State Finfish Survey

Collected 4,462 angler interviews in 2000, of those 473 were charter angler interviews, collecting lengths on 482 fish

Labor	Field time = (10.50 + 2.40) x 4137.5 hours	\$53,374
	Supervisory time = (15.07 + 4.22) x 1170	\$22,569
	<b>TOTAL</b>	<b>\$75,943</b>
Overhead	18.48% of salaries (\$61,076)	\$11,287
	<b>TOTAL</b>	<b>\$11,287</b>
Travel	50,359 miles x \$.345	\$17,374
	<b>TOTAL</b>	<b>\$17,374</b>
Project Costs	Supplies	\$900
	Xerox	\$300
	<b>TOTAL</b>	<b>\$1,200</b>
	<b>GRAND TOTAL</b>	<b>\$105,804</b>
	Cost per angler interview (4462)	\$23.71

MRFSS charter boat mode collected 600 lengths for the pilot, using SC average of 1 fish/charter angler interview (482 fish/473 interviews),

**total cost for SC to collect 600 lengths = 600 x \$23.71 = \$14,226**

**NMFS BEAUFORT LAB HEADBOAT SURVEY**

submitted by Bob Dixon, National Marine Fisheries Service, Beaufort, NC, December 7, 2001

The headboat budget in the table, coding and proofing, includes my salary, another fishery biologist salary, a statistical clerk's salary, and the associated 20% benefits. The costs associated with our port agent were deleted from my original budget since most of the duties involved biological sampling. The following is my original budget:

Port Agent Salary & 20% Benefits	\$38,300
Vehicle (annual lease)	\$ 4,000
Fuel	\$ 800
Electronic Fish Measuring Board*	\$ 400
Electronic Scale *	\$ 120
Supplies	\$ 300
Data Entry	\$ 1,000
Data Processing, Supervision, & Benefits	\$13,100
Total	\$58,020

\* Total cost prorated over ten years.

Our port agent did the outreach; collected, edited & coded logbooks; and some of the validation work. I propose that 10% of the port agent position dealt with logbooks, or an additional \$4,250. That would bring the total headboat logbook portion of the study to \$18,350.

## NMFS COSTS FOR ACCSP PILOT STUDY EVALUATION

Provided by Dave Van Voorhees, National Marine Fisheries Service, December 18, 2001

NMFS Costs for ACCSP Pilot Study Evaluation												
Catch and Effort for South Carolina Charter Boats and Headboats												
NMFS Personnel												
	Annual Salary	Annual Labor Hours	Hourly Wages	Fringe Rate	Hourly Fringe	Overhead Rate	Hourly Overhead Costs	Hourly Labor Costs	Estimated Labor Hours	Estimated Labor Cost	Estimated Travel Costs	Estimated Labor & Travel Costs
VDTS	\$40,000.00	2,080	\$19.23	22.50%	\$4.33	25.00%	\$4.81	\$28.37	72	\$2,042.31	\$27.78	\$2,070.09
CHTS	\$40,000.00	2,080	\$19.23	22.50%	\$4.33	25.00%	\$4.81	\$28.37	72	\$2,042.31	\$27.78	\$2,070.09
Intercept	\$40,000.00	2,080	\$19.23	22.50%	\$4.33	25.00%	\$4.81	\$28.37	144	\$4,084.62	\$55.56	\$4,140.17
Labor hours were not tracked separately for the South Carolina project.												
Labor hours are estimated based on the assumption that SC work would have been a constant fraction of the work for all states.												
Labor hours include hours spent on oversight of contractor performance, review of contractor deliverables (QA/QC tasks), and running/checking of estimates.												
Travel costs for effort surveys are estimated as 1/3 of the SC fraction (1/18) of the costs of travel (\$1,500) to 3 bimonthly data/statistics review meetings for 18 states.												
Travel costs for intercept survey are estimated as 2/3 of the SC fraction (1/18) of the costs of travel (\$1,500) to 3 bimonthly data/statistics review meetings for 18 states.												

Contractor Costs				Estimated Total Costs
	Cost per Interview	Number of Interviews	Total Contractor Costs	
VDTS	\$12.05	1,219	\$14,689.00	<b>\$16,759.09</b>
CHTS	\$3.09	9,060	\$28,038.00	<b>\$30,108.09</b>
Intercept	\$52.23	1,480	\$77,293.00	<b>\$81,433.17</b>

**NMFS COSTS FOR CATCH AND EFFORT FOR ATLANTIC COAST (GEORGIA-MAINE) CHARTER BOATS AND HEADBOATS**

Provided by Dave Van Voorhees, National Marine Fisheries Service, December 18, 2001

NMFS Personnel												
	Annual Salary	Annual Labor Hours	Hourly Wages	Fringe Rate	Hourly Fringe	Overhead Rate	Hourly Overhead Costs	Hourly Labor Costs	Estimated Labor Hours	Estimated Labor Cost	Estimated Travel Costs	Estimated Labor & Travel Costs
VDTS	\$40,000.00	2,080	\$19.23	22.50%	\$4.33	25.00%	\$4.81	\$28.37	468	\$11,025.00	\$361.11	\$11,386.11
CHTS	\$40,000.00	2,080	\$19.23	22.50%	\$4.33	25.00%	\$4.81	\$28.37	468	\$11,025.00	\$361.11	\$11,386.11
Intercept	\$40,000.00	2,080	\$19.23	22.50%	\$4.33	25.00%	\$4.81	\$28.37	936	\$22,050.00	\$722.22	\$22,772.22
Labor hours were estimated for covering all 13 Atlantic States (not including Florida).												
Labor hours include hours spent on oversight of contractor performance, review of contractor deliverables (QA/QC tasks), and running/checking of estimates.												
Travel costs for effort and intercept surveys are estimated as 13 (number of Atlantic states minus Florida) times the estimated costs of travel for SC.												
Estimated total contractor costs were obtained by assuming that per-unit costs were constant and by assuming similar sampling rates in other states.												

Contractor Costs				
	Cost per Interview	Number of Interviews	Total Contractor Costs	Estimated Total Costs
VDTS	\$12.05	12,095	\$145,745.25	<b>\$157,131.36</b>
CHTS	\$3.09	258,175	\$798,974.69	<b>\$810,360.80</b>
Interview	\$52.23	19,333	\$1,009,665.93	<b>\$1,032,438.15</b>

## START-UP COSTS OF SOUTH CAROLINA LOGBOOK PROGRAM

Provided by Nan C. Jenkins, South Carolina Dept. of Natural Resources, December 19, 2001.

Labor		
	Data management development = $(18.61 + 5.21) \times 120$	\$2,858
	Data entry = $(6.94 + 1.94) \times 630$	\$5,594
	Outreach planning = $(21.56 + 6.04) \times 22.5$	\$621
	Outreach presentation development = $(26.18 + 7.33) \times 7.5$	\$251
	Outreach staff participation = $(26.18 + 7.33) \times 4 \times 3$ meetings	
	+ $2 \times (21.56 + 6.04) \times 4 \times 3$ meetings	\$1,065
	<b>TOTAL</b>	<b>\$10,390</b>
Overhead		
	18.48% of salaries (\$8,118)	\$1,500
	<b>TOTAL</b>	<b>\$1,500</b>
Travel		
	2 meetings x 220 miles x \$.345	\$152
	<b>TOTAL</b>	<b>\$152</b>
Project Costs		
	Logbook printing	\$2,700
	Computer	\$2,000
	Office furniture	\$1,500
	Supplies	\$2,000
	<b>TOTAL</b>	<b>\$8,200</b>
	<b>GRAND TOTAL</b>	<b>\$20,242</b>

Program initiated in 1992. All costs quoted in year 2000 dollars.

## **COSTS ASSOCIATED WITH VESSEL VALIDATION PROGRAM**

Provided by Nan C. Jenkins, South Carolina Dept. of Natural Resources, December 19, 2001.

### **VESSEL VALIDATION**

Labor		
	Field validation = 3 clerks x (10.50 + 2.40) x 650	\$25,155
	Data entry = 3 clerks x (10.50 + 2.40) x 104	\$4,025
	Supervisor = (15.07 + 4.22) x 390	\$7,523
	<b>TOTAL</b>	<b>\$36,703</b>
Overhead		
	18.48% of salaries (\$29,628)	\$5,475
	<b>TOTAL</b>	<b>\$5,475</b>
Travel		
	3 clerks x 7800 miles x \$.345	\$8,073
	<b>TOTAL</b>	<b>\$8,073</b>
Project Costs		
	Supplies	\$100
	Printing	\$35
	<b>TOTAL</b>	<b>\$135</b>
	<b>GRAND TOTAL</b>	<b>\$50,386</b>