

MRIP Operations Team

Meeting Summary

The MRIP Operations Team (OT) convened September 23-24, 2009 at the Northeast Fisheries Science Center in Woods Hole, MA to review progress of ongoing MRIP projects and establish priority research areas for 2010. Prior to the meeting, MRIP Work Group Chairs provided OT members with narrative updates of ongoing projects, which are included as Appendix A. Following a review of project progress at the meeting, the OT and Chairs discussed the overall direction of projects, work group membership, project timelines, and obstacles to meeting project goals. Generally, the Chairs are satisfied with Work Group membership and participation, although the level of engagement by Work Group members varies considerably. Because MRIP is largely a voluntary effort, the OT concluded that any level of participation is welcome, provided that participants who are not fully engaged are not delaying progress. The Chairs were asked to provide a list of Work Group members who have become completely disengaged. The OT will follow-up with these Work Group members individually. The OT also welcomes requests for additional work group and/or project team members. Such requests should be submitted by the Chairs to Pres Pate.

The group also discussed obstacles to project progress and areas of concern with the MRIP process. Two major limiting factors were identified; 1) the time required to procure data collection contracts, and 2) the time required to secure approval from the Office of Management and Budget (OMB) to conduct new data collections. The NMFS Office of Science and Technology (ST) recently awarded a “blanket purchase agreement” that should allow the agency to award contracts in a more timely fashion. However, project teams should consider the potential impacts of the procurement and OMB approval processes in project timelines.

The Chairs also expressed a need for greater administrative support from the agency to assist with travel arrangements and meeting logistics. ST will likely be hiring contractors in FY2010 to provide additional administrative support.

Finally, the Chairs requested guidance on how to handle potential overlap among Work Group efforts. For example, both the For-Hire Work Group (FHWG) and the Design and Analysis Work Group (DAWG) have discussed projects to validate discards on for-hire vessels. Currently, members of the FHWG are participating in conference calls with the DAWG “discard project team”. However, the OT should provide guidance on which group should take the lead so that efforts are not duplicated. OT leadership will consider this issue and provide feedback directly to the Chairs.

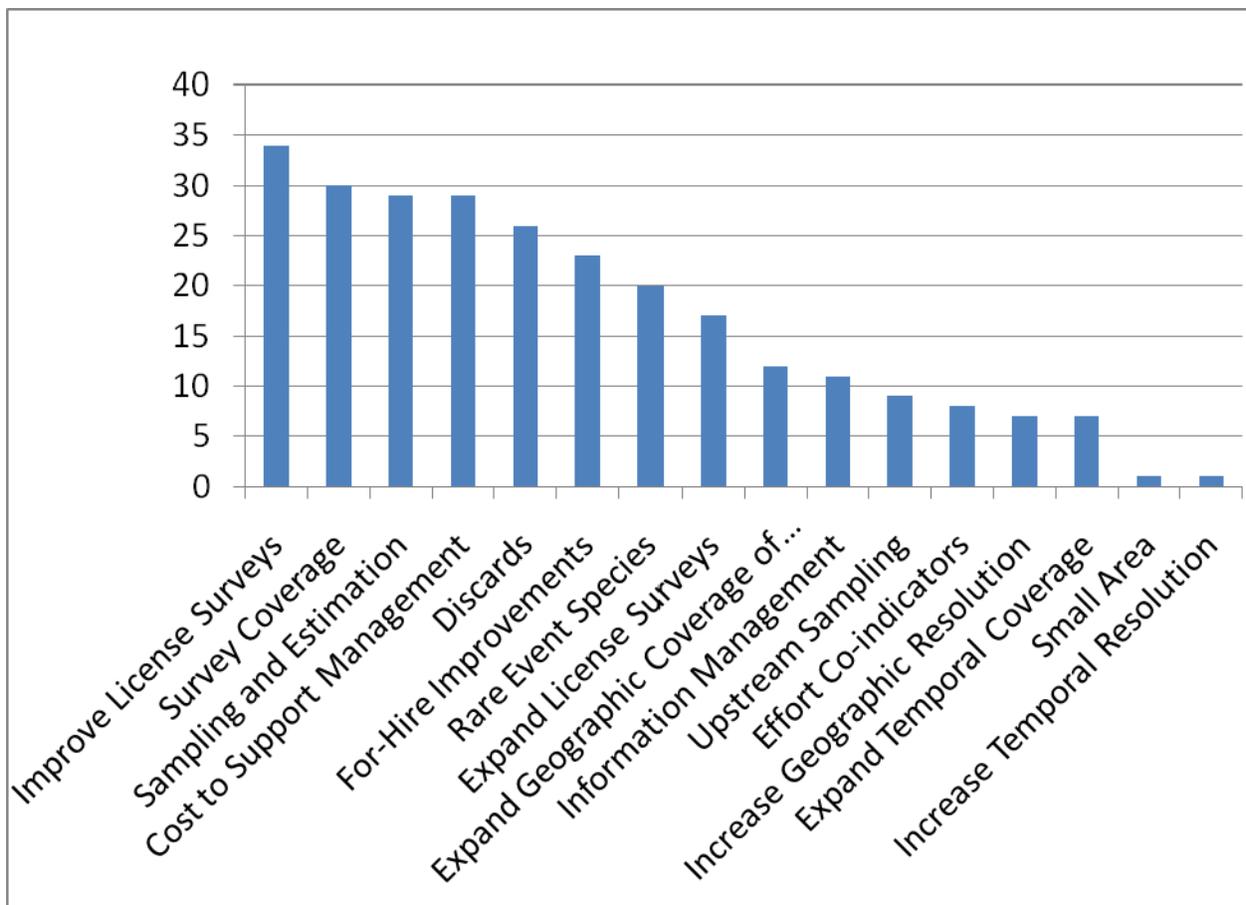
Following the review and discussion of project progress, the OT discussed overall MRIP progress. It was suggested that MRIP has not clearly defined an end point that will provide a clear distinction between MRFSS and MRIP. In addition, the program has not defined clear benchmarks or metrics against which progress can be documented. As outlined in the MRIP Implementation Plan, the program is being developed through a sequential approach with survey improvements being implemented as they are identified and approved. This approach does not provide a clear delineation between MRFSS and MRIP. However, it will allow improvements to be implemented more quickly than waiting to implement a final MRIP design.

One potential measure of progress is to compare MRIP accomplishments to the original recommendations provided in the NRC Review. OT leadership will consider this suggestion and discuss additional benchmarking opportunities with the other MRIP leadership teams. Measures of success and progress can be included in upcoming versions of the Implementation Plan.

The remainder of the meeting was dedicated to 2010 project development. Generally, the process for developing and approving projects for 2010 will be similar to previous years; 1) the OT will identify priority research areas, 2) project teams will develop project proposals describing the purpose and scope of projects, as well provide estimated budgets and milestones, and 3) the OT will make funding decisions following a review of project proposals. Once funding decisions have been made, the OT will ask project teams to prepare detailed project plans for approved projects. Project plans, which will facilitate milestone tracking, will include detailed budgets and timelines.

The OT identified 16 project areas for 2010 (Appendix B). Ultimately, NOAA Fisheries staff determined the priorities of the project areas. However, each individual OT member was asked to provide a relative measure of importance for the projects. Figure 1 provides the priorities of the project areas.

Figure 1. Relative Priority of 2010 MRIP Project Areas



Appendix A. Project Summaries

Design and Analysis Work Group

The National Research Council (NRC) noted that both the telephone and in-person interview components of the angler surveys include data collection and analysis procedures that are based on unverified assumptions. These assumptions may lead to biases in catch and effort estimations. The Design and Analysis Work Group (DAWG) is tasked with addressing assumptions and potential biases in existing data collection programs and when necessary, developing new data collection methodologies that will produce more accurate estimates of recreational fishing catch and effort. Projects developed by the group are addressing the recommendations from the NRC and will ensure that data collection and analyses meet the demands of fisheries managers, to the greatest extent practicable. The work group is developing a system of surveys that will provide more robust information on angler catch and effort with a workable transition from the existing surveys.

Projects that have been developed and implemented by the DAWG include:

- **Development of Survey Methods that Utilize Angler Registries as Sample Frames:** The NRC recommended that future surveys of fishing effort should be based on a universal sampling frame of anglers. The MSA reinforced that recommendation by mandating the, “use of surveys that target anglers registered or licensed at the State or Federal level...” This project, which will evolve as a series of sub-projects, is developing new survey methods that capitalize on the establishment of Federal angler registration requirements while minimizing the potential for error resulting from under-coverage of angler populations, non-response, and misreporting.

Current efforts have focused on integrating registry frames that are incomplete due to licensing exemptions and traditional random-digit-dialing (RDD) frames in a dual-frame telephone survey approach. Ongoing MRIP pilot studies in North Carolina and Louisiana have demonstrated that a dual-frame telephone survey provides considerably greater coverage of anglers than telephone surveys that rely solely on registry or RDD sample frames. Based upon the success of these pilot studies, the methodology will be expanded to Washington in September, 2009 in a study that will also compare resulting effort estimates to estimates derived from a field-based survey of fishing effort.

Future studies will continue to improve upon the dual-frame methodology. A dual-frame mail survey has been approved and will be implemented during the fall of 2009 to test the feasibility of using mail as a data collection mode and assess potential biases in the ongoing telephone surveys. Specifically, the survey, which will sample from an angler registry frame and a comprehensive residential address frame, will assess the coverage, response rates and timeliness of a mail survey approach, as well as begin to quantify reporting errors in existing telephone surveys of fishing effort. The mail survey will be implemented in North Carolina during wave 6 (November/December), 2009.

Pending the results of the dual-frame mail survey, additional projects will be developed to improve angler recall of past fishing activities and measure the impact of non-response on fishing effort estimates. These studies will result in recommendations for designing and implementing surveys that use angler registries as sampling frames.

- **Improving Recreational Fisheries Discard Data:** The NRC suggested that better methods are needed to estimate the number, size distribution and disposition of released fish. Furthermore, the review stated that existing intercept surveys might not provide enough detail to estimate mortality of released or discarded catch. Not knowing the number of released fish or their mortality could impact management and stock assessments.

The project team has completed an analysis comparing angler-reported and observed discard data from headboat trips on the Atlantic coast. The analysis revealed no systematic difference between observed and angler-reported data, suggesting that headboat anglers are able to accurately recall the number of fish discarded. Future studies will attempt to make similar comparisons for other fishing modes and geographic regions that are under a different structure of management. Other regions, such as states on the west coast manage fisheries in-season with some species under state and federal harvest caps, or allowable catch limits. Total fish mortality includes released fish that do not survive as well as retained fish. This management structure may create incentives for anglers to under or over report discards. Future studies will evaluate this aspect as well as generate other ideas for other pilot studies. Pilot studies will be prioritized by the end of September and the development of project plans will immediately follow.

Currently projects under consideration include: 1) alternative methods for at-sea head boat discard assessments with the use of mounted cameras; 2) similarly, establishment of cameras on small charter boats; 3) shore monitoring with and without the aid of cameras; 4) enlistment of charter captains to serve as monitors; 5) use of an alternative platform (boat) to obtain intercepts from recreational anglers operating in the sounds and estuaries; and 6) comparing three treatment groups at dockside surveys (anglers provided with initial discard report to fill out during a trip, anglers provided report following the trip, and anglers that would be informed that they would be questioned upon return). These ideas will be assessed to develop plans to fund projects with the most immediate needs. The group is also trying to establish more representation from the for hire work group.

- **Evaluation of Sampling and Estimation Designs:** The NRC concluded that estimation procedures for recreational fishing surveys might not be consistent with corresponding sampling designs. Such inconsistencies could result in biased estimates of catch and effort, as well as their corresponding variances.

Due to the large number of recreational fishing surveys, the project team is sequentially assessing the sampling and estimation designs for the regional programs. Initial efforts have focused on the MRFSS Access-Point Angler Intercept Survey (APAIS). The project team has fully documented the sampling and estimation designs for all MRFSS surveys and has developed a new estimation approach for the APAIS that provides an unbiased estimator of catch rates. The methodology will be validated by an independent

panel of experts and implemented during the fall of 2009. Implementation will include estimation of catch rates for future survey waves, as well as a retrospective re-estimation for the period from 2002-present.

The project team has developed an alternative sampling design for the APAIS that more closely adheres to the principles of probably sampling theory. The multi-stage design, which will be pilot tested in NC beginning in wave 6, 2010, institutes firm guidelines for sample selection (fishing sites, vessels, anglers), establishes new protocols for determining and recording fishing pressures at intercept sites, eliminates sampler flexibility in choosing alternate interview sites or fishing modes, and accounts for fishing that occurs during off-peak hours, such as night fishing. Lessons learned from the pilot study will be directly applicable to other states and regions.

Future projects will examine sampling and estimation designs for additional recreational fishing surveys (e.g. Pacific RecFIN surveys, CHTS, FHS, LPS) beginning in 2010.

- **Survey Coverage of Angling Populations:** The NRC review identified gaps in the coverage of CPUE survey sampling frames. Specifically, the review noted the inability of current surveys to sample anglers who fish from private shorelines or those who take boat trips departing from private docks. The review also highlighted the lack of sampling from trips that occur or return to the dock at night. Current sampling and estimation procedures assume that catch and effort characteristics of non-sampled segments of angling populations are similar to those of sampled segments. Catch and effort estimates could be biased if these assumptions are invalid.

The project team provided support to the development and implementation of a pilot panel survey in CA to test the assumption that fishing trips that are not covered by current intercept surveys have similar catch and effort characteristics as trips that are covered by the surveys. Two independent panels, one representing public-access fishing activities and one representing private-access fishing activities, were established through telephone interviews with recreational anglers. Panelists, who are provided with logbooks to facilitate reporting, are periodically re-contacted through telephone interviews and asked to provide trip information. The CA panel survey was implemented November 1, 2008 and will continue through October, 2009.

The project team intended to develop additional pilot studies to assess potential errors resulting from under-coverage of intercept survey sample frames during 2009. However, a shortage of human resources has limited the ability of the team to advance other pilot studies. In addition, the team considered utilizing the dual-frame mail survey (described above) as a screener survey to identify a group or panel of anglers from whom to collect catch information. Ultimately, it was determined that the scope of the mail survey should be limited until the methodology proves to be a viable means for collecting fishing information. Based upon the success of the mail survey, the project team will reassess potential offsite methodologies for collecting catch information during the fall and winter of 2009 with the goal of implementing additional pilot studies during the summer of 2010.

Data Management and Standards Work Group (DMSWG)

The NRC recommended greater standardization among regional surveys and between state surveys and national surveys. Specifically, the review called for a “greater degree of coordination between federal, state, and other survey programs...to achieve the national perspective on marine recreational fisheries that is needed.” This group is charged with developing and maintaining data collection standards, protocols, and data access portals for the MRIP. The DMSWG is responsible for ensuring the comparability and compatibility of recreational fishing statistics among regional data collection programs while recognizing that each region has unique information needs and data collection issues.

The Data Management and Standards Workgroup (DMSWG) is charged, in part, with developing data collection standards, protocols, and data access interfaces for the MRIP. DMSWG Project 1 identified and summarized existing fisheries-dependent recreational, for-hire, and highly migratory species programs nationwide. The types of programs covered included state and federal surveys, logbooks, catch card, tournament, tagging programs and others.

Rather than be hampered by inefficient compilation of static documents, the DMSWG built a web-based, database driven application to store data. This standard database interface, known as the MRIP Data Management and Standards (MDMS) system, allows far more robust analysis and reporting options, as well as mechanisms for quality control as members entered program information. Data entered into the MDMS will be used by work group members to analyze existing data collection programs and datasets to develop recommendations for minimum data elements and standards in the new MRIP system.

Before beginning development on the MDMS, the DMSWG considered utilizing InPort for initial data entry. InPort is the national Fisheries Information System (FIS) metadata tool. However, it was determined that given the need for very specific data fields and the time constraints associated with DMSWG projects, it was necessary to build a bridge system to accommodate the initial input and analysis of program information by DMSWG project participants with the understanding that these metadata would ultimately be uploaded into InPort for wider use. As of Summer 2009, the scripts for migrating data from MDMS to InPort have been written. However, not all data fields map directly, and future collaboration between staff is necessary prior to completion of the data upload.

Sixty fields of data were collected and divided into the following eight primary information categories:

- Program - general information such as name, description and design
- Contact(s) - one or more contacts for the program
- Coverage(s) - temporal (range of years) and geographical coverage
- Information Management - data auditing procedures, QA/QC processes, availability of program documentation
- Data Collection - who, what, when and how data are collected, interviewer training protocols
- Data Processing - data entry method, data transformation processes
- Data Access - descriptions of user access levels, confidentiality issues, timeliness of data output
- Data Elements - name, description, and other detailed information for each data set

Pacific Coast RecFIN Web Site Redesign

Internet access to recreational data has been available for many years on the Pacific Coast Rec FIN website. However, key users have found it difficult and cumbersome to access and process the data. Although the sample and estimates data are in regional and national databases, various users have found that accessing and interpreting the data to be time consuming and prone to misinterpretation. This project seeks to integrate documentation and data in a more intuitive manner using recent web programming techniques that are tailored to various user groups.

Current development of the new web site is in an early stage, which is prototyping the user interface in the content management system. The content is intended to be managed with the assistance of the states whose personnel will have accounts for access to their respective areas for the posting of information and instructions. RecFIN has identified all recreational fisheries-dependent information and user groups in their region. A contractor with extensive experience in content management programming was hired in June 2009 and is currently working to develop the core system. The RecFIN Programmer analyst is working with the contractor to develop the content style and key features to access the data and information. Populating the site with content is scheduled to begin in the fall and rounds of review should begin shortly afterward. Project completion is expected June 2010.

Evaluation of Quality Assurance and Quality Controls in Recreational Fishing Data Collections

The NRC suggested that, “the sampling process [for recreational fishing data collections] requires greater quality control.” To that end, the DMSWG has developed a project that will include a complete inventory and assessment of current quality control (QC) and quality assurance (QA) processes, from development and maintenance of sample frames, through collection of survey data and calculation of estimates. Initially, the project will focus on documenting all QA/QC processes, including development of data flow diagrams that clearly illustrate the timing and sequence of existing data quality measures. Concurrent to this documentation, data users and constituent groups will be queried to assess perceived shortcomings in the data collection process. Finally, the documentation and stakeholder feedback will be assessed at a workshop where the project team will develop recommendations for improving QA/QC processes.

The project team has requested feedback from a variety of data users groups, and regional data collection partners have been requested to document QA/QC procedures and develop data flow diagrams. A workshop will be conducted during Winter 2010, and the project team will submit a report documenting recommended enhancements to data quality processes in Summer 2010.

For-Hire Work Group (FHWG)

The NRC suggested that the for-hire industry be considered a commercial sector and that reporting requirements for this sector should be different from recreational fishing activities. Specifically, it recommended that for-hire operations be required to maintain and submit logbooks documenting fishing effort and catch. There is no existing broad authority to implement the NRC’s recommendation for mandatory logbook reporting, but, MRIP is evaluating ways to improve reporting by using all current programs of NOAA Fisheries, the councils, and the states. For example, several regions have implemented for-hire-specific sampling programs that have greatly enhanced data collection in the for-hire sector.

In addition, several states conduct logbook-reporting programs, and NOAA Fisheries administers mandatory logbook reporting for portions of the for-hire fleet in the Northeast and Southeast Regions. In some cases, sampling and logbook programs have been used in dual-frame methodologies to reduce bias and improve precision. The FHWG is charged with addressing data collection issues that are unique to charter, guide, and head boat fishing activities, and ultimately recommending regional approaches for collecting catch and effort data from the for-hire sector.

Projects that have been developed and implemented by the FHWG include:

- **Expert Review of Methods Used to Assess For-Hire Marine Recreational Fisheries of the U.S. (For-Hire Review):** As a follow-up to the general recommendations provided by the NRC, the For-Hire Work Group initiated a detailed, independent review of existing data collection methodologies for the for-hire sector. The three-member review panel, consisting of experts in fisheries management and survey statistics, was asked to provide “best practice” recommendations for collecting catch and effort data from the for-hire sector, and identify improvements that could be made to ongoing sampling and/or census logbook data collections. The full report is available at www.CountMyFish.noaa.gov.

To facilitate the review, the Work Group compiled detailed documentation of ongoing data collection programs. The comprehensive for-hire data collection inventory was completed and submitted to the OT in August, 2008. The review panel completed its assessment and provided a final report to the Work Group in March, 2009. Among the “best practice recommendations” are;

1. Development and periodic maintenance of a complete list of for-hire vessels,
2. Universal logbook reporting for for-hire vessels,
3. Development of a complete list of landing sites used by for-hire vessels to be used as a sampling frame for access-point intercept surveys,
4. Probability sampling for dockside intercept surveys of terminating for-hire trips,
5. Development of procedures to account for non-response.

In addition to these best practice recommendations, the report provided specific recommendations to improve existing regional for-hire data collection programs. These recommendations will provide the foundation for future For-Hire Work Group projects.

- **For-Hire Census with Pilot Electronic Reporting Option for Puerto Rico Catch and Effort Data:** Because Puerto Rico does not have a for-hire-specific data collection program, catch and effort estimates for the for-hire sector are derived from traditional MRFSS methodologies: the CHTS collects information about fishing effort and the MRFSS Intercept Survey collects information about catch. This methodology is particularly susceptible to bias in Puerto Rico, where approximately 80 percent of for-hire anglers are non-residents and are consequently not included in CHTS sample frames.

This project included the development and implementation of a pilot electronic logbook reporting program for for-hire vessels in Puerto Rico. The Puerto Rico Department of Natural and Environmental Resources compiled a list of permitted for-hire vessels, and MRIP provided funding to develop a prototype electronic reporting tool. Development of the reporting tool was completed in December, 2008, and the pilot study was implemented in February, 2009. Despite considerable investments in outreach, participation in the pilot study has been minimal. To date, a single for-hire vessel has provided online logbook reports. A project report, describing the functionality of the reporting tool and documenting lessons learned, will be submitted to the OT by October 1, 2009.

- **Development of Improvements to the Southeast Headboat Survey:** The For-Hire Review provides several specific recommendations for improving the Southeast Region Headboat Survey (SRHS), which collects catch and effort information from headboats operating from NC through TX. Included in the report were recommendations to implement probability-based sampling approaches for the dockside intercept survey component of the SRHS and apply all relevant best practice recommendations. The FHWG has developed several projects to address these recommendations, including the following:
 1. **Development of Probability-Based Sampling methods for Southeast Headboat Survey Dockside Intercept Sampling Program:** This project will result in a modified sampling design for the SRHS intercept survey. A pair of survey statisticians have been hired to develop the sampling design, and the project team conducted a kickoff meeting in June, 2009. The anticipated completion date for the project is spring, 2010.
 2. **Implementation of Electronic Logbooks on Headboats Operating in the U.S. South Atlantic:** The For-Hire Review recommended that reporting should be conducted through an online application. This project includes development of an online reporting tool for the SHRS, as well as a pilot study to test the methodology. The project team has completed a statement of work to procure contractor support to develop the reporting tool, and eight vessels have agreed to participate in the pilot study. It is anticipated that data collection for the pilot study will commence November, 2009, and continue for one year.
 3. **Design of Statistically-Based Substitution Routine for Non-Response in a Census-Design Logbook Program - The NMFS SERS:** Development of methods to account for non-response was a best practice recommendation from the For-Hire Review. This project will result in a statistically-based imputation procedure to account for non-response in the SERS. A survey statistician has been hired to design the imputation procedure. It is anticipated that the design will be completed and the methodology implemented during the spring, 2010.
- **Hawaii For-Hire Pilot Study to Incorporate Validation Procedures in the Commercial Marine License Reporting Program:** Currently, the only source for for-hire catch and effort statistics in HI is the Commercial Marine License (CML) reporting program, which is administered by the Hawaii Division of Aquatic Resources (HDAR) and requires captain and crew of for-hire vessels to obtain a license and provide monthly

activity reports. An assessment of CML data indicates that the program may suffer from under-coverage, non-response and reporting error. This project includes a detailed assessment of the completeness of the CML vessel frame, as well as the development and implementation of a dockside pilot study to validate information provided through the CML.

The project team conducted a kickoff meeting with Hawaii Division of Aquatic Resources (HDAR) staff who are in charge of the Commercial Marine License (CML) reporting system and with a Council staff who coordinates the MRIP in May 2009. Since the kick-off meeting, HDAR has taken some measures to improve compliance. For example, “did not fish” reports are being compared with dealer reports. In preparation for the dockside pilot study, visits have been made to Maui, Hawaii, and Kauai to identify harbors and identify possible surveyor candidates. A dockside test survey was conducted at two charter harbors in Maui. The survey data will be compared with CML reports. The charter boat database for 2007 and 2008 from CML reports has been compiled and the information gathered has aided with selection of survey sites. It is anticipated that the dockside pilot study will be implemented in late 2009.

- **Cooperative Design of a Logbook Reporting Program for the Gulf of Mexico:** Based on recommendations from the For-Hire Review, this project will develop the requirements and design for a pilot study that will test the feasibility of logbook reporting for for-hire vessels that operate in the Gulf of Mexico. The pilot study must be concurrent with regional requirements for mandatory reporting and adequate enforcement. The pilot study design will include specifications for electronic reporting, methods for validating self-reported catch and effort data, and methods for adjusting raw logbook data for missing, late, or inaccurate reports. ,

The project team conducted a workshop in August, 2009 to identify data needs, review reporting options, and discuss possible sources of validation data. A summary report from that workshop was completed in September, 2009. It is anticipated that the project team will finalize the design for a pilot study in late 2009.

Highly Migratory Species Work Group (HMSWG)

Fishing trips targeting highly migratory species (HMS), such as tunas, sharks and billfish, generally make up a relatively small, yet important portion of total recreational fishing activity. Due to the rare occurrence of trips targeting HMS, generalized fishing surveys, such as the MRFSS, do not produce very precise catch estimates for most highly migratory species. The inability of MRFSS to capture HMS fishing activity in a comprehensive manner has resulted in the implementation of specialized HMS data collections such as the Large Pelagics Survey (LPS) and catch card programs for bluefin tunas. While these programs have improved data collection for HMS, they are limited in their geographic scope and may be susceptible to biases described in the NRC’s review. The HMS Work Group (HMSWG) is charged with assessing the statistical design and effectiveness of current HMS data collection programs, developing new data collection methodologies as needed, and expanding the scope of HMS data collection efforts to meet management and science needs.

Projects that are being developed and implemented by the HMSWG include:

Evaluation of the Potential to Use West Coast Recreational For-Hire Sector Data to Produce a Catch per Unit Effort Index of Abundance for North Pacific Albacore Tuna

This project focuses on sampling of the recreational for-hire fleet targeting North Pacific albacore and other highly migratory species (HMS) from ports on the U.S. west coast. The objective of the project is to design a data collection pilot program that would employ onboard observers, enhanced dockside sampling, or a combination of both to determine what long-term modifications to current sampling programs would be necessary to produce more reliable estimates of catch and effort from the fleet.

Analysts with the National Marine Fisheries Service (NMFS) Southwest Fisheries Science Center have identified the west coast HMS for-hire fleet as a potentially valuable index of relative abundance for North Pacific albacore tuna. However, HMS for-hire trips tend to depart and return from port outside of regular sampling hours and so are not sampled at the same coverage levels as other recreational trips on the coast. Because of this coverage issue, current catch and effort estimates produced by the general marine recreational survey programs in Washington, Oregon, and California are considered too unreliable to use as an index of abundance. The data collection pilot program designed by this project will use intensified sampling to evaluate current sampling programs and identify any programmatic changes and associated costs necessary to produce a reliable CPUE time series over the long-term.

Funding for this project will be channeled through the Pacific States Marine Fisheries Commission (PSMFC). The project team has developed a statement of work for consultant support to be the project lead. The consultant will work collaboratively with a regional design team consisting of stock assessment and marine recreational survey experts from the California Department of Fish and Game (CDFG), Oregon Department of Fish and Wildlife (ODFW), Washington Department of Fish and Wildlife (WDFW), NMFS, and advisors from the for-hire fleet to provide the regional design team with information on fishing operations. This position has been officially posted to the PSMFC website and the deadline for proposals is September 30, 2009. Due to start-up delays the period of performance to complete this project has been extended to February 1, 2010. The data collection pilot program design produced by this project will be submitted for the next round of MRIP funding in fiscal year 2010.

Development and Validation of Survey Design Elements for the West Coast Highly Migratory Shark Species Recreational Fishery

In 2008 the Pacific Fishery Management Council entertained the adoption of proposed management measures that included reducing recreational catch for the common thresher shark. Ultimately, the Council decided not to take action as the best available data suggested reductions were not yet warranted. The Council expressed concerns, however, that uncertainties in both the commercial and recreational sampling data did not engender a high level of confidence in that determination. This project addresses these concerns and the recognized need to improve the accuracy and precision of Pacific coast recreational shark data.

The project will be centered in the near-shore waters of Southern California, where recreationally caught HMS sharks are currently sampled by the California Recreational Fisheries Survey (CRFS) using a

systematic randomized design. The systematic random sampling design of CRFS may be inefficient for capturing infrequent, spatially patchy, pulse fisheries. Adaptive sampling methodologies potentially offer a means for increasing sampling efficiency and increasing the precision of the estimates for pulse fisheries. These methods might be used to supplement existing sampling programs, and could be useful for estimating catch in other pulse fisheries (e.g., many beach/bank fisheries).

There are four main areas of uncertainty for the estimates of HMS sharks in the CRFS sample design: (1) HMS sharks, in particular the common thresher shark, are best characterized as being encountered in pulse fisheries that might not be effectively captured by the CRFS systematic randomized design as mentioned above; (2) the CRFS design assumes that the species targeted (i.e., trip type), catch composition (species and size), and catch rates of trips ending at publicly-accessible sites during daylight hours (i.e., trips ending at “covered” sites) are the same as those for trips ending at “uncovered” sites (i.e., sites that are not publicly-accessible and not sampled by CRFS); (3) the CRFS design assumes that the species targeted (i.e., trip type), catch composition (species and size), and catch rates of trips ending at publicly-accessible sites during daylight hours are the same as those ending at publicly-accessible sites during night time hours (i.e., trips that are not currently covered under the CRFS sampling design); and (4) the overall shark catch, including releases, from organized shark fishing tournaments.

The project team is currently in the process of recruiting a subject matter expert to assist with this project. The expert would ideally have background and experience in adaptive sampling techniques for recreational fisheries survey design, data collection and analysis. The assignment will be to work with the project team to develop an adaptive sampling methodology which is intended to estimate HMS shark catch with the level of accuracy and precision needed for management. In addition, it will look at the cost of supplemental sampling methods using the adaptive sampling design. The period of performance will be from award date through February 28, 2010.

Highly Migratory Species Private Angler Telephone Survey – Florida pilot

This study was conducted to describe and assess the impact of the private boat recreational fishery in Florida for Highly Migratory Species (HMS), including sharks, billfish, tunas, and swordfish. It employed an established sampling methodology to estimate directed fishing effort by private recreational vessels. This entailed a telephone survey that randomly selected a proportion of HMS Angling category permit holders every two weeks over a 12-month period. Permit holders were asked to voluntarily share trip and catch data for trips in which the vessel caught, or tried to catch, any HMS during the two-week sample period. Conducted from May 2008 through April 2009, the survey achieved a successful contact rate of 60.1%, with only 3.5% refusing to participate. The remaining permit holders were either ineligible for the survey (4.7%), not actively fishing in Florida during the period selected (4.5%), or were unable to be contacted (27.2%).

Over the course of the year, approximately 19,000 HMS Angling category vessel trips (PSE 4.1%) are estimated to have occurred throughout Florida. This estimate does not include vessels with principal ports outside of Florida that took HMS trips in Florida. About half of the trips targeted and/or caught billfish. Swordfish trips were the second most common HMS trip (19.8%), followed by tuna (14.1%), sharks (11%), and the remaining trips were comprised of

combinations of multiple HMS (5.1%). For all HMS species groups, the large majority of trips occurred in southeast FL (69.5%). While species from each HMS group were targeted and caught throughout the year, seasonally most sailfish trips occurred from November through February, tuna, shark, and marlin trips from May through August, and swordfish trips from July through December.

HMS trips that returned to private access sites constitute a large segment of the fishery that is not being monitored by the MRFSS access point intercepts. Nearly half (47%) of reported HMS trips returned to a private access site. Comparisons of trip frequencies and catch rates are currently being analyzed to investigate potential biases identified by the National Research Council's 2006 review of the Marine Recreational Fishing Statistics Survey (MRFSS). Preliminary analysis indicates no significant differences in catch rates between vessels returning to public versus private access sites. With exception to swordfish, most HMS trips returned to access sites during daylight hours (96.8%). Swordfish trips primarily returned at night (58.7%), although the proportion of successful trips (i.e., trip with swordfish catch) was nearly equal between trips returning at night and during the day (approximately 25%). The preliminary tournament data analysis showed that while tournaments comprise a small percentage of total HMS trips (7.9%), catch rates during tournament trips were higher for swordfish (0.59 vs. 0.38 fish/trip non-tournament) and billfish (3.1 vs. 1.4 fish/trip non-tournament).

The survey generated total catch estimates that were more precise for some species compared to estimates produced by the MRFSS over the past five years. This included yellowfin tuna, blue marlin, white marlin, and swordfish. Sailfish total catch estimates had the highest precision (16,936 fish, PSE 9.5%), but the estimates were a fraction of MRFSS estimates that also had a relatively high precision (62,870, PSE 13.5%). Differences between these estimates could be due to catch of sailfish in state waters by anglers not possessing a federal HMS permit. Release rates for billfish and sharks were extremely high at 99.7%. The PATS estimated harvest for swordfish (561 fish, PSE 21.5%) was significantly higher than the self-reported harvest from the Automated Landings Reporting System (ALRS, 297 fish, Angling category only). While tournament catches are not reported to the ALRS, this could not explain the difference since only a small proportion (13%) of the PATS reported swordfish harvest was caught during a tournament.

The methodology employed for this pilot study shows potential for improving the ability to monitor the recreational HMS fishery in Florida. Utilization of a permit list frame for sampling purposes improved the efficiency and precision of estimating HMS effort and total catch for several species. Future studies should attempt to validate catch estimates based on self-reported phone (or internet) data with dockside intercepts to confirm the accuracy of species identification and recall. The estimation of harvest for some very rare landed HMS (e.g., marlin and sharks) remains problematic and alternative sampling methodologies including census approaches may be needed for more reliable estimates. It is recommended that a question be added to future MRFSS intercept surveys to estimate the proportion of catch and landings for various HMS caught by anglers fishing without a federal permit, either in state waters or illegally in federal waters. If this turns out to be a significant component it may be necessary to implement a dual-frame survey approach with one frame based on the HMS permit list and another that covers captains of non-permitted vessels. Future studies should also consider incorporation of a web-based reporting option as over 80% of permit-holders interviewed expressed a willingness to participate in a future Internet survey.

Characterization of Rod and Reel Highly Migratory Species Fisheries in the U.S. South Atlantic and Gulf of Mexico

Recreational fisheries targeting highly migratory pelagics such as tunas, billfish, and sharks make up a relatively small proportion of all recreational saltwater fishing effort. Trips directed at highly migratory species (HMS) can differ from more typical near shore fishing trips in many attributes including fishing locations, access sites, return times, tournament participation, and perhaps most importantly species composition and catch rates. Such differences, combined with the “rare event” nature of HMS fishing trips can often present unique sampling challenges. Generalized saltwater angler surveys aimed at estimating catch and effort for all species often do not produce very precise or accurate estimates for many highly migratory species. The purpose of this project was to characterize the HMS fisheries in the Gulf of Mexico and South Atlantic as an initial step towards evaluating the need for alternative data collection methods to improve on the accuracy and precision of HMS data in these sub-regions. The survey population included all HMS Angling (6,239) and Atlantic Tunas General (867) category permit holders whose principal port state was in North Carolina, South Carolina, Georgia, Alabama, Mississippi, Louisiana, or Texas. HMS Charter/headboat category (185) permit holders in Texas were also surveyed. A contractor was hired to implement a telephone survey of all permit holders on these lists (i.e., attempted census). The telephone questionnaire focused on basic characterization questions such as how often, where (access sites) and when (times, seasons) do anglers fish for HMS, what species do they target, and do they participate in tournaments. The questionnaire was pre-tested by five HMS permit holders in the study area. A pre-notification letter was sent to each permit holder several days before dialing began. The CATI telephone survey was conducted during a three week period in September 2008. A total of 5,098 completed interviews were conducted out of 7,291 permit holders attempted for a 70% completion rate.

Private boat (Angling and General categories) permit holders reported taking, on average, about 6 HMS trips per year in the Gulf of Mexico and South Atlantic. Yellowfin tuna is the most frequently targeted and caught HMS managed species throughout the region. Although not managed by NMFS, blackfin tuna are also highly pursued, particularly in the Gulf. Sailfish, blue marlin, and white marlin are all important target species for billfish anglers in the Gulf and South Atlantic. Although caught and released in large numbers, the majority of blacktip sharks are caught incidentally by anglers targeting other (non-shark) species.

The potential for bias associated with under-coverage of restricted access site HMS trips is relatively high and should be addressed in the design of future recreational HMS surveys in this region. One out of every four permit holders indicated using a personal dock as their primary access site for HMS fishing. Prevalence of private dock usage varied greatly by state (e.g., Alabama nearly 40% versus Louisiana only 13%). Both species targeted and HMS catch rates varied considerably by primary access site type. Billfish were far more likely to be targeted on trips returning to personal docks than on trips returning to public boat ramps. The opposite was true for trips targeting sharks. Angling category vessels returning to personal docks reported catching fewer sharks but more billfish per trip than vessels returning to public boat ramps. Considering the differences found between personal dock and public boat ramp HMS trip catch rates, the potential for bias associated with under-coverage of private access HMS trips should be positively correlated with both the relative prevalence of inaccessible personal dock trips, and the proportion of all intercepted HMS trip interviews conducted at public boat ramps.

Regional differences were found between the South Atlantic and Gulf in potential bias associated with under-coverage of trips returning during off-peak sampling times. Overnight fishing trips are an extremely important component of the Gulf of Mexico HMS fishery but considerably less common in the South Atlantic. Potential bias associated with under-coverage of trips returning during off-peak times (i.e., late night and early morning) is a bigger concern in the Gulf. Comparisons between MRFSS assignment end times and reported HMS trip return times also revealed a large mis-match in the Gulf of Mexico. Seventy percent of Gulf Angling category permit holders indicated their most common HMS trip return time was between 5:00 pm and 10:00 pm. By contrast, 94% of all MRFSS Gulf assignments (across the same cells as the characterization survey) ended at or before 5:00 pm. MRFSS data on interview assignment end times suggests that for the South Atlantic the “peak” return time window for HMS trips is adequately being covered by the survey.

Characterization survey results suggest that, in addition to lacking the desired level of precision, MRFSS intercept survey catch rates are biased low for some of the most frequently targeted and caught HMS species in the Gulf of Mexico and South Atlantic. Biased MRFSS catch rates for highly migratory species may be due to a combination of under-coverage of overnight HMS trips, trips returning to private access sites, and trips associated with tournaments, as well as other factors. If the management and assessment of these species rely upon precise and accurate total catch and landings estimates for the recreational sector, NMFS should consider implementing alternative data collection approaches in the region. Characterization results from this study can be used to either implement a new data collection pilot for HMS in the Gulf of Mexico and South Atlantic or to assist in the redesign of the MRFSS to more adequately cover “rare event” highly migratory species.

In addition to yellowfin and blackfin tuna landings, other commonly reported caught (although mostly released rather than landed) HMS in this region include skipjack tuna, bull shark, sand tiger shark, blue marlin, white marlin, and sailfish. Prospective survey design changes associated with the replacement of MRFSS with MRIP will likely improve the quality of catch estimates for these species in both sub-regions. However, more significant survey design changes and sample size enhancements will likely be needed in the Gulf of Mexico to attain the same level of accuracy and precision. Therefore, a specialized survey focused on HMS fishing may be a more efficient and cost effective way to improve the accuracy and precision of catch estimates for these species in the Gulf of Mexico. For both sub-regions the relative advantages and disadvantages of modifying a generalized survey, such as the MRFSS, to accurately and precisely estimate rare event HMS catches must be weighed against those of implementing a specialized data collection program focused specifically on HMS. This decision should be based on several factors including: 1) the specific management or stock assessment need for a specified level of data quality and timeliness for particular species or species groups, 2) what changes to the MRFSS are actually implemented in the coming years under MRIP, and if this re-design will accommodate the need for improved data on “rare event” species in general, and 3) the relative cost associated with each approach.

For species that are infrequently landed, even on directed HMS trips (e.g., billfish, swordfish, shark species), accurate and precise landings estimates will not be attainable through modifications of a generalized survey such as the MRFSS, and may not even be feasible or cost effective through a specialized survey approach. An attempted census of all landings that is widely publicized, requires

mandatory reporting, has adequate enforcement, and can be independently validated may be the only way to achieve the desired level of data quality for these species. Results from this study could also inform decisions regarding where and for what species a catch card census type programs might work, and what special provisions would need to be put in place to increase motivation to comply. For example, characterization survey results suggest that a catch card program may be more effective in Louisiana, where personal dock use is relatively small (13%), than in Alabama where 39% of HMS permit holders use personal docks. Boats returning from HMS fishing “after hours” when landings tags and catch cards are not available is more of a problem in the Gulf than South Atlantic. A catch card program implemented in the Gulf would need to accommodate HMS trips returning “after hours” (i.e., after marina operated reporting stations have closed).

Evaluation of the Sampling Distribution of Tournament Versus non-Tournament Trips in the Large Pelagics Survey

Tournaments are an important part of the total directed fishery for pelagic HMS. The catch rates and fish sizes from tournament trips typically differ from those associated with non-tournament trips. It is important that fisheries surveys represent tournaments in proportion to their occurrence as either over- or under-representation of tournament trips could affect the accuracy of HMS catch rates, estimates, and size distributions. This study evaluated the sampling distribution of tournament trips in NOAA Fisheries’ Large Pelagics Survey.

The rate at which tournament trips are sampled in the LPS was evaluated to assess whether tournaments are being disproportionately represented in the data compared to non-tournament large pelagic trips. LPS data from 2003-2008 were analyzed to compare tournament sampling rates from Large Pelagics Intercept Survey (LPIS) with tournament trip rates reported on the Large Pelagics Telephone Survey (LPTS). For comparisons that involved pooling across LPS cells (i.e., year/mode/area/month level) data were weighted by cell level effort estimates. LPIS data were weighted by the estimated total number of LPS boat trips, whereas LPTS data were weighted by estimated number of “on-frame” LPS boat trips. Results suggest that tournaments are being oversampled in the dockside LPIS compared to rates of tournament trip reporting on the complementary phone survey (LPTS). Oversampling of tournaments in the LPIS, and the potential for biased estimates associated with oversampling, is significantly more prevalent in LPS states north of Delaware (i.e., New Jersey through Maine) and in the private boat mode than charter boat mode.

For comparison with LPS tournament data, an attempted census was conducted of all 2008 HMS tournaments from Maine through Virginia based on tournament operators summary reports. As a starting point for creating an inventory of HMS fishing tournaments, all registered 2008 tournaments in the LPS range from Maine through Virginia were compiled into a spreadsheet that was updated weekly. The master tournament list was subsequently augmented with unregistered tournaments found through the Recreational Billfish Survey (RBS), LPIS and LPTS datasets, internet searches, and via word of mouth from talking with operators of registered tournaments. Operators of all identified HMS tournaments were mailed a notification letter and reporting summary form prior to the start of the event. Data from the pilot study were combined with RBS summary form data and tournament data collected the Massachusetts Division of Marine Fisheries through the Massachusetts Sportfishing Tournament Monitoring Program. Of the 89 total tournaments identified, 63 (70%) had registered with NOAA as an HMS tournament. Data

were collected from 59 of the 89 total tournaments (66%). The majority of tournaments are categorized as “mixed” tournaments meaning tournament prize categories exist for two or more species groups (e.g., tunas/billfish, tunas/sharks, tunas/sharks/billfish). Exceptions to this were New York which has a large number of tournaments targeting only sharks, as does New Jersey to a lesser extent. The average tournament had about 60 boats, although the data were heavily skewed with a lot of smaller tournaments and only a few very large tournaments. The median value of 34 boats per tournament may, therefore, be a more appropriate central measure. A large majority of sharks (91%) and billfish (95%) reported by tournament directors were released alive whereas tunas and others species (e.g., dolphin/wahoo) reported were almost always landed.

Dockside interviews were conducted with captains at five HMS tournaments to assess the proportion of fish caught during tournaments that actually get reported to the tournament operator. A total of 188 HMS tournament trip interviews were conducted dockside. Of those trips with fish caught, 59% said they reported (or planned to report) at least one fish to the tournament from that day’s trip. Over 80% of tunas (bluefin and BAYS) kept during tournament trips sampled were reported to the tournament and all (100%) of the sharks, billfish, and swordfish were reported. Less than half (44%) of the dolphin kept during tournament trips sampled were reported to the tournament. Fish released alive were generally not reported with the exception of one billfish “release only” tournament where points are awarded for releases. These results suggest that data from tournament director summary reports underestimate landings of dolphin, and perhaps to a lesser extent, landings of tunas. Summary reports may also severely underestimate the number of HMS (all species) released alive during tournament trips as many of these fish are not reported by captains. By contrast, tournament landings of sharks, billfish, and swordfish based on directors summary reports appear to be more complete.

Comparisons of 2008 total landings and total releases for select species were made between LPS tournament domain estimates and tournament director reports. Results indicate a systematic difference between director reports and LPS domain estimates. For all species analyzed, LPS tournament domain estimates of total landings and total releases were larger than corresponding totals from director reports. Results from the pilot study dockside sampling suggest that landings of certain species and all releases are biased low in tournament director reports. Comparison between LPIS and LPTS sampling rates suggest that LPS estimates may be biased high for species more commonly caught during tournaments due to a positive catch rate bias resulting from dockside oversampling of HMS tournaments. The systematic differences found when comparing LPS tournament estimates and director reported catches support these findings, and are likely due to a combination of these two factors.

A sensitivity analysis on LPS estimates was conducted to determine 1) which particular species are more sensitive to this potential bias, and 2) the relative magnitude of the catch estimation bias resulting from differing hypothetical rates of oversampling tournaments in the LPIS. For many species, including bluefin tuna, BAYS tunas (bigeye, albacore, yellowfin, skipjack), and dolphin, down-weighting of tournament trips by as much as 25% or 50% still resulted in fairly insignificant changes to LPS landings estimates. Thus, these species appear to be fairly robust to oversampling of tournaments, indicating that catch rates (i.e., catch per LPS intercepted vessel trip) do not differ greatly between tournament and non-tournament trips within a given month/area/mode cell. By contrast, landings estimates for commonly targeted sharks (i.e., blue, common thresher, and shortfin mako) were particularly sensitive to tournament trip down-weighting. These shark species are more likely to be landed during an intercepted tournament

trip than a non-tournament trip within a given cell. Results suggest a strong positive bias in LPS shark landings estimates and billfish release estimates due to LPIS disproportionate sampling of tournaments. These findings support the need for changes in the current LPS design and possibly a new data collection methodology focused on HMS tournaments to improve on the accuracy of recreational shark catch estimates and billfish released alive estimates.

Non tournament HMS Landing Reporting for Private Boats in Puerto Rico Phase 1:

Fishery Characterization and Outreach

In response to an International Commission for the Conservation of Atlantic Tunas (ICCAT) recommendation, NOAA Fisheries has recently passed a rule establishing an annual domestic landings limit of 250 Atlantic blue and white marlin, combined. NOAA Fisheries has implemented mandatory programs in an attempt to closely monitor billfish landings in the Atlantic, Gulf of Mexico and Caribbean. Owners of vessels targeting marlin and other Highly Migratory Species must obtain either an Angling category or a Charter/headboat category permit. Permit holders are required to report all non-tournament recreational billfish landings to NOAA Fisheries via phone or internet within 24 hours of off-loading. However, the compliance rate with this mandatory reporting requirement is thought to be extremely low, particularly in Puerto Rico. MRFSS catch and landings estimates for billfish (and other HMS species) in Puerto Rico are typically very imprecise due to the rare event nature of these fisheries. Lack of precision on these estimates makes it difficult to justify using these data for assessment and monitoring purposes. These data may also be inaccurate due to potential biases associated with the MRFSS design as identified in the National Research Council report. This project addresses the identified need to improve data collection approaches for estimating catches of marlin and other HMS in Puerto Rico.

For Phase 1 of this project the MRIP HMS Work Group recognized the need to first characterize Puerto Rico's recreational HMS fishery before attempting to implement a new data collection methodology. Characterization studies and pilot surveys are an important initial step in the development and implementation of full-scale catch and effort data collection programs. Information obtained from such studies is often essential in selecting the appropriate methodology and in defining the scope of new data collection programs. A telephone survey questionnaire was developed which included questions on HMS fishing avidity (years fished, trips per year), target species, primary access type, multi-day trip prevalence, seasonal trip distribution, HMS catches, tagging activity, tournament participation, and preferred reporting methods. Puerto Rico DNER (PRDNER) biologists attempted to contact 810 out of 1,011 HMS Angling Category permit holders. Completed interviews were conducted with 405 permit holders for a 50% response rate. Of the 405 interviews conducted, 266 respondents said they used their permitted vessel to fish for HMS at least once in the past 12 months.

The available data for billfish landings in Puerto Rico come mainly from recreational fishing tournaments. Although more billfish are landed outside of tournaments than in tournaments, non-tournament landings are rarely reported through the NMFS mandatory reporting system. For example, in this study interviewed permit holders reported landing 20 blue marlin during the 2008 fishing season. This is likely a minimum estimate since less than half of the Angling category permit holders were interviewed, and this does not include non-tournament billfish landed by HMS Charter/headboat category vessels. By contrast, data collected through the PRDNER HMS tournament program in 2008 reported only two blue marlin landed. This demonstrates the need to more closely monitor non-tournament HMS

fishing in addition to continued monitoring of tournaments. Interviewed permit holders also reported releasing 909 blue marlin, 373 sailfish, and 167 white marlin outside of tournaments. MRFSS estimates for blue marlin released alive have fluctuated from 918 to 7,253 between 2000 and 2008 with PSE's ranging from 27% to 91%. MRFSS estimated sailfish and white marlin releases are even more erratic and less precise. White marlin releases have been estimated at zero for six out of the last nine years, while sailfish have fluctuated from 449 to 8,480 released during that time period.

Characterization survey results suggest that a catch card program might work well in Puerto Rico. For one thing, the large majority of HMS recreational vessels return to marinas or boat ramps. Only about 10% of Angling category permit holders indicated they use personal docks for their HMS fishing vessels. In addition, Puerto Rico has a relatively small number of access sites where recreational HMS vessels return to. Therefore catch card reporting stations could be set up at these central locations to facilitate the exchange of landings tags and catch cards. The establishment of reporting stations at all marinas with HMS vessels will require a targeted outreach effort by PRDNER and NOAA Fisheries. Since billfish are landed in relatively small numbers, compared to bluefin tuna in Maryland for example, the burden on marinas or other businesses that serve as official reporting stations to hand out tags and collect catch cards will be minimal. Sharks and swordfish could be added as species that would require a landings tag since, similar to billfish, these species are recreationally landed in very small numbers in Puerto Rico.

While a catch card program should improve the accuracy and precision of billfish landings estimates, a different method will be needed to improve the accuracy and precision of estimated billfish released alive. One approach would be to increase MRFSS sample sizes, particularly in months when the majority of billfish are caught. Characterization survey results indicate that increasing sample sizes in Waves 3 (May/June) and 5 (September/October) would likely improve the precision of estimated billfish total catch and released alive. More investigation is needed to determine how much additional sample size would be needed to obtain precision levels within an acceptable range for management and assessment purposes. The cost of increasing sample sizes to achieve the desired level of precision may be prohibitive, particularly for white marlin and sailfish which are less frequently targeted and caught compared to blue marlin. If so, a more cost effective approach may be a weekly (or bi-weekly) random telephone survey of HMS Angling and Charter/Headboat permit holders during the billfish season. It is expected that anglers should be able to recall the number of billfish by species they released alive in the past week (or two), particularly if an advance letter is mailed notifying anglers that they have been selected to report.

This characterization survey was the first part (Phase 1) of the two-phase MRIP project aimed at improving non-tournament HMS recreational data collection in Puerto Rico. Phase 2, scheduled for the 2010 season, will involve development and implementation of an HMS recreational data collection pilot in Puerto Rico, along with an aggressive outreach program to promote and increase awareness of the new program.

Appendix B. MRIP Project Areas for 2010

Project	Description/Comment	Project Key
Continue to develop/enhance procedures for sampling anglers from registries or state license databases.	Includes additional testing of alternate modes, assessment of measurement, coverage and non-response error.	Improve License Surveys
Develop and implement studies to compare catch rates, catch and fishing characteristics and angler characteristics between accessible and inaccessible fishing sites (private access and night fishing).	This project has been on the table for two years. Has been proposed as a follow-up to mail surveys of fishing effort (testing feasibility of mail surveys for collecting fishing information).	Survey Coverage
Assess sampling and estimation methods for CHTS, FHS, Pacific RecFIN, AK, TX, LPS, participation, etc.	Current efforts have focused on MRFSS access-point intercept survey. Other programs should be assessed. Could include comparisons with methodologies used for National Survey of Fishing, Hunting and Wildlife-Associated Recreational Activities.	Sampling and Estimation
Develop projects to assess data collection costs to support fisheries management	For example, in-season quota management, ACL's and AM's.	Cost to Support Management
Further develop and implement pilot studies to test alternative methods for collecting discard data.	Discard Project Team identified 3-4 potential pilot studies to test alternative methods for collecting discard data.	Discards
Implement studies to develop and test "best practice" recommendations from for-hire review.	For example, GOM electronic logbook, implement SRHS intercept, etc., VTR/FHS integration, non-response follow-up studies, coverage of guide fisheries	For-Hire Improvements
Develop survey methodologies for "rare event" or pulse fisheries.	Generalized recreational fishing surveys may not provide adequate coverage of rare event fisheries such as red snapper in the South Atlantic, HMS, etc.	Rare Event Species
Expand Angler License Directory Surveys (ALDS) / Dual-Frame estimation methodology to additional states/regions.	Begin to utilize Federal Angler Registry once it becomes effective (January 1, 2010). License survey project team is still developing improvements.	Expand License Surveys
Expand geographic coverage of recreational fishing surveys.	For example, USVI	Expand Geographic Coverage of Surveys
Develop MRIP information management architecture		Information Management
Develop data collection methodologies to cover upstream/freshwater portions of anadromous species ranges.	Was requested by ASMFC last year for Atlantic Coast.	Upstream Sampling
Develop comparisons between fishing statistics and alternative indicators of fishing effort (e.g. fuel, bait, tackle sales).	A recurring issue in criticism of MRFSS estimates not matching angler opinions about effort and effects of variables such as weather and fuel prices.	Effort Co-indicators
Increase the geographic resolution of current survey methods.	For example, stratification of FL into 5 areas.	Increase Geographic Resolution
Expand temporal coverage of existing recreational fishing surveys.	For example, wave 1 sampling on Atlantic coast.	Expand Temporal Coverage
Develop model-based and/or model-assisted estimators for domains that have insufficient sample sizes for direct estimation.	The NRC Review provides several examples and applications. Applications could include sub-state estimates (e.g. Chesapeake Bay), low activity waves, and sub-wave estimates.	Small Area
Increase the temporal resolution of current survey methods.	For example, 1-month waves.	Increase Temporal Resolution

