

# RECOMMENDATIONS OF THE BLUE RIBBON PANEL ON MARINE RECREATIONAL FISHING DATA



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- A. *INTRODUCTION*
- B. *BETTER TIMELINESS TO INCREASE MANAGEMENT FLEXIBILITY*
- C. *IMPROVED DATA QUALITY*
- D. *USING NEW TECHNOLOGIES TO ADDRESS BIASES AND SPATIAL RESOLUTION*
- E. *ANGLER OUTREACH AND ENGAGEMENT*
- F. *CONCLUSION*



## A. INTRODUCTION

This report provides specific ideas and recommendations for addressing one of the longstanding challenges of effective management of federal and state marine fisheries. Data quantifying recreational fishing impacts have been difficult to gather in a timely manner and have not been of sufficient accuracy for practical use. In recent years, these challenges have led to increasing controversy, as management decisions have been made without timely information regarding in-season recreational catch levels, thereby precluding the opportunity for mid-season adjustments.

In July 2010, the Theodore Roosevelt Conservation Partnership (TRCP) convened a Blue Ribbon Panel (BRP) of nationally recognized experts on marine recreational fishing data from academia, industry and resource agencies to examine this problem. The BRP gathered in Washington, D.C., to discuss potential solutions for consideration by appropriate federal entities and other groups interested in improvements in collecting and analyzing marine recreational fishing data. Recommendations made by the BRP are outlined in this report.

Through the support of The Walton Family Foundation, the BRP was organized and facilitated by the TRCP based on a recommendation from an ad hoc group of marine conservation and recreational fishing organizations known as the Fish Collaborative (FC). These organizations meet regularly to examine current federal fisheries management issues (background on the FC is attached).

In the fall of 2009, 12 marine conservation and recreational fishing organizations participating in the FC sent a letter (attached) to Dr. Jane Lubchenco, under secretary of commerce for oceans and atmosphere and administrator of the National Oceanic and Atmospheric Administration (NOAA), emphasizing the need to improve the timeliness, accuracy, reliability and use of catch data related to recreational fishing in the assessment and management process. Subsequent to the transmission of this letter, the FC determined that it would be logical and helpful to build on the assertions made in the letter by providing more specific, independent recommendations from experts on this subject to NOAA, DOI and other management agencies. The FC reached consensus on the belief that the current federal efforts to address marine recreational data, primarily through the Marine Recreational Information Program (MRIP), were insufficient and that MRIP and the federal approach to recreational fishing data in general were in need of major improvements. The BRP concurs with this conclusion.



The TRCP’s George Cooper and Michael Misurek organized and facilitated the BRP workshop and report.

The three co-chairs of the BRP, drawn from the FC, are

- Dick Brame, Coastal Conservation Association
- Chad Hanson, Pew Environment Group
- Doug Rader, Environmental Defense Fund

The members of the BRP are

- Joe Powers                      Assoc. Professor – Dept. of Oceanography and Coastal Sciences, LSU
- Rick Starr                      Interim Director, California Sea Grant Extension Program
- Jerry Ault                      Professor of Marine Biology & Fisheries, University of Miami
- John Boreman                Professor, Department of Biology, NC State University
- Andy Cooper                 Associate Professor, School of Resource and Env. Mgmt. SFU
- Lee Blankenship             Director of Biological Services, NWMT
- Alexei Sharov                Staff Scientist, MD Department of Natural Resources
- Dean Wendt                 Professor, Biological Sciences Department, Cal Poly
- John Carmichael            Fishery Stock Assessment Scientist/SEDAR
- Peter J. Auster              Research Professor of Marine Sciences, University of CT
- Jim Cowan                    Professor, Department of Oceanography and Coastal Sciences, LSU

The BRP recommendations appear in sections that address specific issues pertaining to recreational fishing data, including timeliness, quality, use of new technologies to address biases and spatial resolution issues, and angler engagement. There is some overlap among sections as these issues are not mutually exclusive.

The difficulty that resource management has had historically with collecting, analyzing and using recreational catch data in an effective fashion has contributed to many management problems, including recreational anglers who unintentionally exceeded total allowable catch limits in certain fisheries. When the federal government and regional bodies do not make timely management adjustments in recreational or mixed-use fisheries to avoid exceeding catch limits, shorter seasons and reduced catch limits the following year are often the result, which further aggravates the problem of recreational fishery closures. The critical need for identifying innovative and creative new ways for federal marine resource management bodies to enhance timely collection and analysis of recreational catch data is discussed further in section B.



Section C examines the quality and accuracy of recreational data and discusses ways to improve recreational fisheries statistics. The quality of data has been criticized and has led to low confidence by some fishery participants and data users. While some improvements are being analyzed, developed and implemented by the MRIP, this report examines alternative methodologies that have worked elsewhere and recommends new ideas that could be applied.



Section D investigates ways to reduce biases in the data and their spatial resolution by using new technologies and methodologies. Innovations, such as use of cell phones and VMS to transmit data and techniques that better capture areas of concentrated fishing effort, are explored in this section.

Section E examines how to improve engagement by anglers in the data collection process and ways to reach out to those groups.

In this report, the members of the BRP provide practical and straightforward recommendations informed by examples drawn from a wide range of alternative data collection systems, including research programs focused on recreational fisheries and methods currently used to monitor catch in non-federal fisheries, as well as innovative and relevant data collection systems from other natural resource management arenas.

This report does not provide recommendations about how improved data should be used for specific management actions, such as setting seasons, nor does it try to answer questions about the quality of data needed to make good decisions.

Additionally, this report does not estimate the costs of the various methods or innovations that are discussed, but it acknowledges the critical need for substantial new funding and resources to address recreational fishing data needs.

It is the intent of the BRP for these recommendations help NOAA, and the federal marine management system in general, take a step forward with the MRIP. Ultimately, the goal is to encourage the development of more robust and accurate recreational data collection systems that are capable of prompting adjustments and management measures. These adjustments will allow recreational anglers to avoid exceeding annual catch limits and quotas, will lead to management approaches that are compatible with how recreational fisheries are prosecuted, and ultimately enhance information availability and utility through time. The recommendations in this BRP report are meant to feed positively into the ongoing changes being made through the MRIP and other data collection and monitoring programs. The BRP seeks to help the federal government move toward a system that will improve accountability, enhance marine recreational fisheries management nationwide, allow for greater fish conservation, and enhance the overall recreational fishing experience for everyone.



**B. IMPROVE TIMELINESS TO INCREASE MANAGEMENT FLEXIBILITY****BACKGROUND:**

Commercial harvest data, because of the inherent industrial infrastructures, often are reliably assimilated in “near real time” into the fishery management process. But this level of data integration and efficiency is not yet possible when considering many types of recreational fishing activities. Due to the sheer numbers of private recreational anglers, the myriad means by which they access the fishery, and their diverse motivations, it has proven difficult for managers regulating coastal and marine species to assess and regulate recreational harvests and exploitation rates. Managers attempt to regulate angler behavior through a combination of input and output controls such as seasonal and areal closures, and bag limits and size limits. But the process of acquiring data in a timely and accurate manner, especially in terms of in-season monitoring and adjustments in catch levels, has proven difficult for the reasons described above. As such, recreational fisheries sometimes have exceeded their total allowable catch before management was able to recognize the problem and react.

Timeliness, as used in this report, refers to lags in reporting recreational catches that limit a manager’s capacity to adjust in-season harvests to prevent overages in quota allocations. It also pertains to time lags in producing annual fishing effort and catch estimates. In both scenarios, timeliness must be improved to more effectively monitor the magnitude of recreational catches, both while the fishery is ongoing and for the management process as a whole.

Because it would be expensive in many – if not most – cases to increase timeliness enough to allow in-season harvest adjustments, investments should be prioritized to address situations where the target species are “valuable,” either in terms of biological condition (i.e., in overfished condition, being overfished, or rare for a variety of reasons, like salmon) or economic potential (e.g., billfish). In general, it is important to improve both the availability of data necessary for management, and the consistency between management structures and information availability. In at least some cases, it may make more sense from both fiscal and management effectiveness standpoints to adapt management approaches, tools and strategies to reflect available information rather than doing the reverse. This may mean greater degrees of precaution are incorporated or maintained in management while long-term investments are considered to reduce uncertainty and maximize harvest opportunities on time scales relevant to each fishery.



In general, discussion on the topic of timeliness fell into two broad categories:

### 1. What to do with the data as collected?

Most of the BRP discussion centered on means by which the time between data collection, reporting and analysis can be reduced.

While there are improvements in efficiency that may allow for faster turnaround times, such changes likely would add additional expenses by a currently unknown but probably significant amount, and they also may compromise data quality.



A difficulty with limiting the impacts of recreational fisheries is that harvests increase in proportion to stock abundance and can rise as a stock recovers. While it may be difficult to gather data to adjust management with precision, it may be possible to develop complementary indicators (e.g., tackle sales, boat traffic and bait sales) that would allow managers to detect increases in catches and/or effort and adjust catch accordingly.

When it comes to how and when to use data and the question of whether in-season adjustment can and should be a realistic goal, our group had varying opinions. Clearly, however, the degree to which data collection systems can adequately support near-real-time or in-season management varies, both in cost and in suitability. But for many fisheries, it may well be possible – certainly for the for-hire sector but also for many existing private angler sectors, as well.

### 2. What to do with management?

Management must do a better job of determining the amount and impacts of recreational fishing effort to keep harvests below target levels. Recreational effort likely will increase as abundance increases in recovering fisheries stocks. Harvest control has traditionally been accomplished with the season timings, closed areas, bag limits and size limits. However, management usually sets regulations for the next year based on conditions (exploitation rate, spawning stock size, etc.) in the current or even past years. Management should develop better means to project trends in recreational effort over shorter time scales (i.e., using the most recent data) to better estimate future harvests.

A key component of improved management is to match available funds with fishery goals. For example, if a primary goal is to maximize recreational opportunities throughout the year, then bag limits should be conservative to reflect the lag time in data collection and analysis. If a primary goal is to maximize catch, then a great deal more funding is necessary to shorten the lag time in data collection and analysis.



**IDEAS:**

- Implement recreational management plans with goals established for a 3-5 year time horizon, recognizing that catches may vary and exceed allowable levels in one year but could fall below the next, which should mitigate the inherent volatility in recreational management measures.
- Currently management has usually implemented the longest open season possible, running the risk of an overage or, if possible, an early closure, which is very unpopular with anglers. A better strategy may be to set more conservative (shorter) harvest seasons so that adjustments only would lengthen the open season and work in the anglers' favor.

**C. IMPROVING DATA QUALITY****BACKGROUND:**

Recreational fisheries are capable of capturing a large percentage of the total allowable catch for many species. Thus, improving the quality of recreational data, particularly in the private recreational sector, is greatly needed to ensure both the sustainability of fish populations and viability of the recreational fisheries under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Improved accuracy and precision of recreational fisheries data also will result in a higher degree of confidence in the information used to assess, monitor, and manage our nation's fisheries. All constituents involved, including researchers, managers, fishery participants, the public and elected officials, should be confident that the best data and management systems possible are being utilized to ensure long-term sustainability of the fish populations and the fisheries that rely on them. As the system of Annual Catch Limits and Accountability Measures mandated by the MSA for all federally managed species comes on line, improved data quality becomes even more important.

Existing recreational fishery data largely come from dockside sampling and creel census programs coupled with random phone surveys. These data then are used to generate fishery catch and effort estimates, which may be principal components of stock assessments. Unfortunately, as currently constructed, these surveys cover a relatively small percentage of the total trips. In addition, self-reported information from logbooks and dockside sampling, particularly information on the numbers of released fish, for the most part are not validated.

Under the MSA, information on estimated removals is ultimately used to set and assess allocations against annual catch limits; as such, accurate recreational fishery catch information is becoming much more important. It should be noted, however, that while more sampling may improve precision in the data, it may not sufficiently address accuracy in estimating the actual catch or effort, and thus new strategies for survey design should be investigated and implemented.



Vast improvements in estimates of mortality associated with recreational fishing, whether from fish caught and kept, or caught and released, are greatly needed. For instance, typical release mortality rates (i.e., released fish that die) from recreational fisheries used in stock assessments often come from either the commercial fishery or independent research. A 2006 National Research Council report on survey methods for recreational fisheries highlighted some serious deficiencies in approaches for data collection and subsequent estimation of fishing effort and mortality<sup>i</sup>. While the MRIP is being designed and implemented to address some of these deficiencies<sup>ii</sup>, at least in part, there may be other strategies and methods outside the scope of the MRIP that could greatly improve monitoring approaches and quality of the resulting data for managing recreational fisheries. The BRP recognized the need to improve in-the-water estimates of catch and mortality (as well as increased fishery-independent sampling) to improve data quality.

The BRP participants were asked to examine other possible innovative and alternative means to improve the data quality, specifically for recreational fishing mortality data. In general, improved data quality will require employing multiple tools simultaneously and should include not only increased and focused data collection efforts, but also direct engagement of anglers and fishery participants in data collection, as discussed later in this report. Additionally, sampling programs and surveys should be optimized and prioritized to obtain data focused on predetermined objectives and goals. To improve recreational fishery data quality, particularly for estimation of catch and effort, the BRP developed the suite of recommendations highlighted below.

#### *IDEAS:*

##### Prioritization of Species

The BRP acknowledged that, due to the magnitude of the numbers of recreational anglers and fishing trips, an estimation procedure will be necessary rather than a complete census of the fishery. Noted exceptions may include some specialized fisheries such as billfish and West Coast salmon; reporting systems used with these fisheries should be considered for use elsewhere. So-called “fish stamp” and “card reporting” systems are good tools and improve data quality in systems where the fishery is highly dispersed and dockside reporting and observers are not practical.

To optimize use of limited fiscal resources and personnel, fishery monitoring and data collection systems should be prioritized toward fisheries of greater concern based on ecological and/or economic importance. Priority also should be given to stocks that currently are overfished or experiencing overfishing. The most valuable fisheries are typically the species with the largest magnitude of fishing effort in any given region and often are focused on higher trophic level predators that play important ecological roles. Ideally, prioritization of species also would include consideration of fisheries directed at multiple species, as appropriate and feasible.



Management decisions must be based on the best available information. While management goals often are stipulated by law, management strategies for these important species – and perhaps otherwise – should reflect the degree and types of information that is available and be designed to enhance the availability of key information wherever possible. Because costs would escalate quickly, it will be essential to prioritize investments as noted above.

#### Prioritization of Uncertainties

Numerous sources of scientific uncertainty exist in the process of estimating overall population sizes and safe levels of exploitation that prevent overfishing and maintain long-term sustainability. For example, for recreational fishing data used in stock assessments, various degrees of uncertainty are associated with estimating the actual level of catch in any given year for each species. This leads to major uncertainties in estimating survival rates for fish caught and released. Because of the uncertainty, data collection and monitoring programs should focus sampling efforts on minimizing uncertainties based on management and fishery objectives. Improvements in data collection and research (e.g., catch-and-release mortality) should be directed toward those species where there is the greatest potential return in investment (i.e., reducing the buffer between the overfishing level and the level of acceptable biological catch).

#### Prioritization of Biases

Similarly, biases have been identified in the marine recreational monitoring programs preceding the MRIP, primarily MRFSS, which affect the accuracy of catch estimates used for stock assessments. The NRC 2006 report highlighted numerous sources of bias in the MRFSS, which to varying degrees are being addressed by the MRIP process. Sources of biases identified by the NRC include (i) inability to sample anglers with private access to fishing, (ii) lack of sampling of nighttime fishing and (iii) use of phone surveys, which don't include individuals who strictly use cell phones and do not reside in coastal counties.

Data collection and monitoring programs that are being redesigned to improve overall data quality of select fisheries also should consider, and be prioritized by, known or presumed biases. Some expert judgment must be involved in assessing which biases to address based on predetermined objectives. Reducing or eliminating some biases over others may be more beneficial in improving accuracy of the data and also may improve confidence levels in the data. Tradeoffs in reducing biases and data uncertainty also should be examined in redesigning sampling and monitoring programs. (Bias issues are examined further in Section D.)



### Catch-and-Release and Discard Mortality

As long-term trends in overall effort increase, restrictions for species are implemented, and more emphasis is placed on catch-and-release fisheries. As such the fate of fish that are caught but released alive or dead is becoming an increasing issue with assessment of marine recreational fisheries. In private recreational fisheries, numbers of released fish are generated largely based on unverified angler reporting through dockside sampling programs. Efforts are underway through the MRIP and the Gulf Council to provide logbook reports from the entire for-hire fishery in the Gulf of Mexico and perhaps in other regions as well. However, verification of self-reported data, such as bycatch, is important to ensure confidence in the accuracy and precision of these data. One way to accomplish these objectives includes the use of trained volunteer anglers and guides and increased observer program coverage. It is important that sampled trips are representative of the entire fishery so as to not introduce additional biases. Additionally, any differences in sampling techniques and expertise among the various types of volunteer sampler programs and fishery observer programs should be calibrated as best as possible. Private angler reporting programs also could employ catch (or punch) cards or fish harvest tags that are verifiable through the dockside sampling programs. Also, mail-in or online surveys could be used to improve biological and spatial data, as well as fine-tuning recreational estimates.



To improve estimation of the overall mortality associated with recreational fishing, more data need to be collected on the characteristics and disposition of retained and discarded fish. For instance, information on the length or weight of species caught and of species caught and released could be provided by volunteer anglers or provided through some type of observation program, including live observers or video cameras on boats. To better understand and estimate the fate of released fish, observed disposition of the fish should be required in the angler or for-hire reporting systems. Semi-quantitative methods have been developed and used in scientific studies<sup>iii</sup> and could be translated to data collection and reporting programs. Additionally, details of the type of terminal gear used (e.g., circle hook, J-hook, live bait and hook size) should be collected. Depth of capture also is very important information to obtain from recreational fishing trips, in addition to more detailed spatial data. It is widely known that depth is one of the most important factors affecting survival for numerous species that are caught and released, and hence depth could be used as a predictor of mortality associated with discards.

Currently, much of the data used to estimate release mortality rates comes from fisheries using different gear and methods of fishing (e.g., commercial vertical gear). Targeted studies are needed to improve release mortality estimates, either directly or indirectly through ancillary programs (e.g., tagging or holding tank studies). Together, these data should provide scientists the means to estimate more accurately the number of fish that are released and provide much-needed information on the characteristics and disposition of released fish.



### Standardized Trip Definition

A key and fundamental component of estimating total fishing mortality is defining and computing effort and use of the assumption of a direct proportionality between fishing effort and stock size. In current recreational fishing sampling programs, the definition of what constitutes a trip is generally not clearly defined or standardized. Future survey programs should provide better clarity on what information should be gathered from recreational trips (i.e., actual length of time fished and time of day) to provide better estimates of these relationships. Having this level of clarity can help improve estimates of effort and catch per unit effort (CPUE).

### Quality Control Check

Adding new or redesigning current data collection and monitoring methods, particularly those that use angler volunteers to obtain information, also needs to have some QA/QC verification and assurances to ensure the data are useful and valid. While anglers could be considered samplers in the system, the engagement of angler volunteers to provide data at any level should be controlled or measured against a calibrated standard. For instance, different experience levels may result in vast differences in how data are collected and reported, and it is important to develop ways to calibrate the various levels of information. One way to provide some calibration up front could be to employ a well-designed system of education and training programs in conjunction with the development of angler volunteer sampling programs (see Section E for more on this). It should be acknowledged that the use of observers on recreational trips, while desirable, is not always feasible, particularly at the statistical level of coverage needed and the size of vessels employed. Other methods to capture on-the-water observation should be explored, however, and are discussed later in this report (Section E).

### Cross Validation with Fishery Independent Data

With the onset of new monitoring and management regimes, opportunities for using non-traditional or fishery-independent data sources to validate fishery monitoring programs should be thoroughly investigated. Aside from the use of new technologies, which are discussed elsewhere in this report, new data programs should develop alternative means to gauge fishing effort and mortality. For instance, tracking and analyzing secondary measurements of effort, such as bait and tackle sales, marine gas sales and license sales, could be used to estimate or supplement fisheries data. This information could be useful for in-season monitoring (as discussed in Section B) and for post-season assessment to better ground truth more traditional methods of catch and effort estimates. New ways could be developed to gauge participation and effort by monitoring boat ramp use or sales, parked boat trailers or on-the-water boat activity. Additionally, the use of anglers as observers or samplers may provide another reliable index of stock abundance that could be used both in stock assessments and as an independent data set to cross-validate other data types.



### Independent Sampling to Compare With Surveys

Scientists acknowledge that the only true way to obtain better accuracy and precision in estimating fishing mortality, and thus improving stock assessments, is through well-designed fishery-independent sampling and research. This is particularly true in the southeastern United States where this kind of information is generally lacking for many species. Data collection and monitoring programs could be designed so that they are directly comparable to independent sampling and research, or vice versa. For instance, important population-level information can be obtained by estimating how many fish remain in the water through fishery-independent surveys conducted in conjunction with estimating how many are removed by the fisheries. Independent sampling and survey strategies can collect data for all species while gathering data for more targeted species and should be considered for improving the overall knowledge and monitoring of population levels and status.

### **D. USING NEW TECHNOLOGIES TO ADDRESS BIASES AND SPATIAL RESOLUTION BACKGROUND:**

Although this section originally was planned as a discussion about “data accuracy,” it quickly became clear that many of the key opportunities to improve the overall quality of marine recreational fishing data already had been put on the table in earlier sections.

As indicated in Section C, the BRP agreed that important biases exist in marine recreational data sets that limit their overall utility in fisheries management, both in terms of stock assessment and evaluation of sectoral performance, including compliance with catch limits. “Bias” is used here in its technical sense, to mean systematic favoritism or misrepresentation in data collection systems that can result in misleading or inaccurate results. Of special significance in this case is selection or sampling bias, whereby certain subsets of recreational anglers are systematically underrepresented as a result of the design or implementation of recreational sampling protocols.

The panel felt that most of the biases in current recreational statistical collection programs are widely recognized (including in the NRC study) and that the real task is to develop and implement targeted strategies that will reduce or eliminate key biases. The panel focused discussion on specific high-quality measures that could be used to reduce bias where it would make the greatest overall difference.

As an overarching principle, the BRP strongly endorsed the use of collaborative approaches to data collection and the development of improved data collection systems, working directly with recreational anglers and the for-hire sector. While much can be learned from natural and social scientists, much also could be learned from the anglers themselves. Outreach to anglers, guides, and business owners and their employees is discussed further in the next section.



The BRP also quickly agreed that one paramount limitation in most, if not all, recreational data sets is the lack of spatial specificity (resolution), which greatly limits the overall utility of that information. Part of this problem derives from the natural hesitancy of anglers to reveal high-production spots that have required significant investments of their time and effort to detect. Part of the spatial resolution problem, however, also comes from natural variation in fish distribution and abundance patterns, variability in fishing effort related to proximity to ports and access areas, and variability both in patrolling effort and in creel surveys. Examples include dramatically reduced sampling both at night and in remote locations. Overall, this bias adds significant additional uncertainty in the estimation of total recreational fishing mortality.

Much is happening now to reduce key biases, both in the elaboration of the MRIP and in state-based efforts. For instance, a new pilot program in North Carolina has sampling effort restructured to account for the major biases in the current sampling protocols. It remains unclear exactly what kind of resources will become available for improved data recreational collection systems and what the effect will be on overall performance.

*IDEAS:*

- Enhance the use of VMS or equivalent systems in the for-hire fleet to improve the spatial and temporal data resolution.
- Expand the use of commonly available technologies (GPS, cell phones, on-board computers, etc.) as the basis for improved data collection systems for private angling.
- Expand the use of voluntary tagging programs (analogous to the program administered by the American Littoral Society) to enhance data on migratory behavior and other biological indicators if and when the data for those other indicators is deemed to be objectively useful.
- Increase investments to collect flyover and satellite information to enhance understanding of the spatial distribution of recreational effort.
- Develop new and independent sampling protocols to validate and tune the baseline recreational data collection systems.
- Dedicate greater resources to analyzing and integrating information about patterns in recreational effort and mortality, better reflecting both biophysical consideration and social and economic considerations.



- Ensure that all of this improved information is utilized to help improve the overall performance of recreational fisheries and fishery management planning, including expanding the engagement of trained recreational fishermen and the fishing public in complementary data collection programs, and improving the transparency and accessibility of the results.
- Expand resources dedicated to fishery-dependent and independent data collection and analyses, especially for recreationally targeted species.
- Concentrate sampling or monitoring effort in places of high probability of catching fish, utilizing spatial structure and some temporal structure.
- Develop dedicated study fleets to focus on particular problems and issues related to catch-effort relationships, variation in catch across habitats, links to fishery independent surveys, etc.

Finally, a consensus also developed among the BRP members that some additional clarity is needed on the degree of overall improvement in performance so that investments in improved data collection systems can be tracked and prioritized.

## **E. ANGLER OUTREACH AND ENGAGEMENT**

### **BACKGROUND:**

The BRP believes that there are both tremendous needs as well as opportunities when it comes to getting individuals from the saltwater recreational angling community directly involved in efforts to improve the quality and coverage of recreational fishing data.

Any effort in this area, however, must be made with the intent of working with recreational anglers as partners and samplers in the system. Trust must be established in order to get anglers to provide the kinds of information that are needed. If anglers are truly to be brought in as partners from scratch to help develop new systems for measuring their activity, then there can be buy-in, which is critically important. It is also important to remember that fishermen can tell us more than just where they fish and what they catch.

Formalized agreements should be considered in this area rather than an ad hoc approach. The former has traditionally worked much better with the recreational angling communities than other methods of stakeholder engagement.

With the right incentives, namely a compelling case that their fishing opportunities and experiences will be improved by their helping improve data regarding their activity, recreational anglers could provide a massive boost in addressing recreational fishing data problems, providing there are adequate controls and verification.



## Ideas:

- Develop and expand partnerships with fishing clubs and other angler groups to explore options to improve recreational data collection generally.
- Blend scientifically designed studies with the use of volunteer anglers and the for-hire fishing fleet to conduct fisheries-independent surveys, such as occurs in California<sup>iv</sup>.
- Train experienced anglers (guides and others) as a potential higher-quality data layer, as prospective observers in recreational sectors and as potential peer-education leaders (more below).
- Expand the engagement of social scientists so that anglers' behaviors and preferences are better captured through the design of recreational fishing protocols.
- Tap into social science methods to bring in knowledge of experts who can address why people fish and why they fish where they do.
- Merge social aspects with the effort to capture localized effects to fishing behavior, which differ geographically.
- Use "all stars" to facilitate angler engagement in the data collection and monitoring process.

**ALL STARS**

Consideration should be given to the recruitment of "all stars" in a given geographic area who are particularly well suited to partner with federal or state officials. All stars in a given region could include professional guides, bait and tackle shop owners and workers, and the leadership and active members of local angling clubs.

Highly motivated and knowledgeable individuals considered all stars could help guide data gathering efforts, participate themselves as observers and drive greater angler participation. These all stars could assist with educational efforts and help increase trust between anglers and government officials, which often is sorely lacking, particularly at the federal level. Recruiting and engaging the right kinds of all stars would address the quality and quantity of data provided to federal and state officials. As such, federal and state officials should recruit the all stars jointly.

One of the many advantages of using all stars is that they could help provide information on the variability in quality among different kinds of recreational anglers – an element that has received inadequate attention.



All stars need not just be on the water day-to-day. For example, a system should be considered that measures what types of people are, and are not, buying in tackle stores to help forecast fishing effort. All stars from recreational fishing-dependent businesses could help with this and other options for use of purchase related information.

## **F. CONCLUSION**

The BRP offers these ideas and suggestions in the hopes of helping state and federal fisheries agencies do a better job of factoring in recreational catch and effort in management of our ocean resources. The time has come to evolve beyond the MRFSS and build on the MRIP to establish a multi-prong ongoing program that captures the most pertinent recreational fishing data reasonably possible in a given fishery and then ensures that the data are used to make timely management decisions. If a critical mass of the nation's approximately 13 million recreational saltwater anglers becomes part of this effort, and if the public sees public resource management decisions being driven more by timely and accurate data, the level of buy-in will increase dramatically for key management decisions.

In the last 100 years, we have seen the non-saltwater sporting communities for the most part embrace state and federal natural resource decisions regarding hunting and fishing because of the steadily increasing level in confidence in the science and data driving those decisions. They also have bought into the management processes because they participate as partners with fish and wildlife professionals and because they see significant staff and resources being dedicated to addressing their interests and accurately measuring their impacts and efforts.

In order for the Department of Commerce and the federal government in general to move to this sort of relationship with the recreational angling communities when it comes to marine resource management, we must build toward a much better system for gathering and using saltwater recreational fishing data. Ultimately, having a system that more accurately captures recreational catch and effort and uses that information in a more timely manner not only serves the fishing community, but also helps to aid better management decisions in general and promote the long-term health and conservation of our nation's marine fisheries resources.



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